A NEW ONTOLOGICAL APPROACH TO URBAN FORM: TOWARDS A MODEL OF HETERARCHY

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ABSTRACT

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This thesis focuses on the ontology of urban form in order to develop a strategy to explore the formal capacities of the elements of urban environments. Through an analysis of the structural logic behind the systems of hierarchy and heterarchy with regard to the set theory, it argues that the tree model is inadequate for this endeavor with its highly rigid, genealogical binary structure. Hence, it proposes that the set-dependent tree model based on principles of hierarchy should be abandoned in favor of a set-free rhizomatic model built upon principles of heterarchy. In that sense, it aims to explore the possibilities of transforming the urban environments confined within the limits of tree conception, into assemblages made up of multiplicity of elements in their heterogeneous form. Benefitting from the concepts of essence and emergence, it introduces a framework for an abstract spatial thinking in which the formal spatial interplay of constituent elements of the urban environments play the most significant role.

Keywords: rhizome, tree (arborescence), assemblage, essence, emergence

ÖZ

KENTSEL BİÇİMLENMEYE ONTOLOJİK BİR YAKLAŞIM: HETERARŞİK BİR MODEL ÖNERİSİ

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Bu tez kentsel formun ontolojisine odaklanır ve kentsel çevreleri oluşturan elemanların biçimsel kapasitelerinin ortaya çıkarılabilmesi amacıyla bir strateji geliştirmeyi amaçlar. Hiyerarşik ve heterarşik sistemlerin arkasındaki yapı mantığının kümeler teorisinden yararlanarak çözümlendiği bu tezde ağaç yapı modelinin katı, soycu, ikicil yapısı nedeniyle yetersiz olduğu savunulur. Bu nedenle, hiyerarşik ilkeler üzerine kurulmuş, küme temelli ağaç yapı modelinin; heterarşik ilkelere dayanan, küme bağımsız rizomatik model lehine terk edilmesi önerilir. Bu anlamda, ağaç yapı modelinin limitlerine hapsolmuş kentsel çevrelerin; elemanların heterojenliğinden gelen çeşitlilikle oluşan asamblajlara dönüşme olasılıklarının keşfedilmesi amaçlanır. Öz ve oluş kavramlarından yararlanarak, kentsel çevreleri oluşturan elemanların biçimsel etkileşiminin ana rolü üstlendiği soyut bir mekânsal düşünce biçiminin geliştirilmesi amaçlanır.

Anahtar Kelimeler: rizom(köksap), ağaç yapı, asamblaj, öz, oluş

To My Family

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PREFACE

This thesis is an attempt both to explore the urban formal relational patterns that are peculiar to cities and to propose new ones that make use of formal capacities of the constituent elements of the urban environments. Hence, the ontology of the urban form is analyzed with an emphasis on its structural logic in order to discuss the corollaries of systems of hierarchy and heterarchy. As opposed to "tree" thinking based on principles of hierarchy, the "rhizomatic" thinking is proposed as a conception based on heterarchical principles in exploring the formal capacities of urban environments. In this regard, it is argued that the set-dependent, hierarchical logic of the tree needs to be abandoned in favor of a set-free, heterarchical understanding employed in the formation of rhizomes. By means of this strategy, this thesis attempts to discover the possibilities of transforming the urban environments confined within the limits of trees, into assemblages made up of multiplicity of elements in their heterogeneous form.

In this manner, this strategy requires an engagement into the assemblage theory, as rhizomes are created by the aggregate of assemblages. Thus, a research on the theory of assemblage is undertaken to develop a methodology that can serve as a basis in achieving rhizomatic environments. To this end, the theory of assemblage proposed by Deleuze; and further developed by DeLanda, is utilized in novel frames of references that are not intended by its authors. Although Deleuze suggests assemblage in a philosophical inquiry that aims to figure out the ontology of "things" without any specific content, and DeLanda develops this into a theory that aims to understand the "social ontology", this thesis benefits from the theory of assemblage to explore the "formal ontology" of urban environments. Through this new interpretation, the ontology of both the existing urban formal relational patterns and possible new

ones could be revealed. However, in order to utilize assemblage in understanding the formal characteristics and capacities of urban environments, it becomes necessary to define the different relationship types that act upon urban form, causing it to take shape into trees rather than rhizomes. It is because addressing these would help to understand the conditions that turn cities into organic totalities and prevent them from transforming into rhizomatic assemblages. In doing so, two types of relations that are proposed by DeLanda, namely "the relations of interiority" and "the relations of exteriority" are utilized to understand urban formal relational patterns, where the former is created via the principles of hierarchy and the latter is established through the logic of heterarchy. In contrast to relations of interiority that are demonstrated by organic totalities, relations of exteriority are established by rhizomatic assemblages, through which not only properties but also capacities of the constituent elements can be exercised. Hence, it is proposed that the conditions that generate relations of interiority preventing elements from inter-category combinations should be eliminated in order to exercise relations of exteriority. Although the conditions that generate relations of interiority are numerous, some of them are more significant than others in determining the characteristics of urban form. Property ownership patterns and urban codes are the major forces along with several others including social, political, cultural and economic mechanisms that lead to ongoing hierarchization of urban relational patterns.

To avoid this *status quo*, it is asserted that the conditions that generate relations of interiority needs to be abolished in favor of an abstract spatial thinking in which the formal spatial interplay of constituent elements of the urban environments play the most significant role. In other words, this thesis, aiming to explore the formal capacities of the elements of urban environments, suggests ignoring the conditions that make cities take shape the way they do, rather, it focuses on the formal spatial interplay of the elements in constituting the urban form. While doing this, two axioms are proposed as the guiding

principles to be referred to in this new inquiry. The first axiom of this theory challenges essentialism proposing that elements cannot be categorized into kinds/sets. In contrast to essentialist view, it suggests that there does not exist a set of particularities that are necessary to the identity of a specific entity. By means of this argument, it denounces the categorization of elements sharing the same particularities into kinds/sets as it already rejects the existence of the essences attributed to them. Rather, it explains the resemblance between certain elements with the shared process that entities have undergone. In other words, this argument asserts that sets are not defined by "essential traits" embedded in entities, but rather, it promotes the shared historical process as the reason behind. Rejecting the role of essential traits in the creation of sets, it also suggests that if the shared historical process changes, then entities should be able to adapt to the new conditions, as there exist no essences to prevent them to do so.

In conjunction with this discussion, the second axiom, proposing that the possible relationship between two [or more] elements cannot be anticipated unless they are brought together, provides a genuine point of view in understanding the properties and capacities of entities with regard to the concept of emergence. This concept suggests that entities may have capacities that never come into being, unless another entity to induce interaction comes over, because entities may perform emergent behaviors that they cannot perform separately. When this discussion is transcribed to understand urban form, it brings to mind whether there exist capacities of elements of urban environments that are not performed due to the fact that they have been undergoing the same process throughout history.

In this regard, this thesis aims to change that particular history that prevents elements from displaying their emergent capacities in creating formal relational patterns, to trigger the unexpected results that cannot be foreseen beforehand. To this end, "permutation" is utilized, since capacities are emergent, and

exploration of them requires a strategy where as much as possible configurations are tested out. It involves decomposing urban environments into its elements, ripping those elements off from their essences, putting them in a basket and tossing them in the air. By this strategy, it is aimed to explore as much configurations as possible to discover the unexplored characteristics of capacities.

II

This thesis, in every aspect, is opposed to trees; hence writing it in a tree structure would result in a contradiction. Therefore, the text is designed to be non-hierarchical; meaning that, it does not have a structure in the conventional sense. The chapters are not sequential and, to a certain extent, they can be read independently from one another. Together, they convey an overall meaning, but each of them is a meaningful whole by itself. Hence, they can be shuffled, put in reverse order or reviewed however readers like.

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"A CITY IS NOT A TREE", NOR IT IS A SEMI-LATTICE[1]

> "The tree of my title is not a green tree with leaves. It is the name for a pattern of thought."[2]
>
> "We are tired of trees. We should stop believing in trees, roots and radicles. They've made us suffer too much."[3]

"Tree" is a pattern of thought that is borrowed from nature. It offers a perspective, through which things are considered as "organisms". It has inspired mankind for centuries on various fields of study. Aristotle urged that one should "determine the organs which are indispensable to every animal" in order to understand the characteristics of state.[4] Hegel proposed that "the idea of the state […] is the individual state as a self-related organism".[5] The impact of tree thinking revealed itself not only on philosophy, but also on various

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[1] Parts of this chapter is presented in the 7th International Deleuze Studies Conference 2014: Models, Machines and Memories in July 2014 in İstanbul.

[2] Alexander, C., A City is Not a Tree, *Design*, No:206, February 1966, originally published in *Architectural Forum* in 1965, p.47

[3] Deleuze, G. and Guattari, F., *A Thousand Plateaus: Capitalism and Schizophrenia*, University of Minnesota Press, Minneapolis, Trans. by Brian Massumi, 2004, originally published in French in 1980, p.15

[4] Aristotle, *Politics*, Batoche Books, Kitchener, Trans. by Benjamin Jowett, 1999, p.85

[5] Hegel, G. W. F., *Elements of the Philosophy of Right*, Cambridge University Press, Cambridge, Ed. by Allen W. Wood, Trans. by H. B. Nisbet, 2003, p.281

fields of inquiry, and architecture and planning was no exception. Anthropomorphism was among the most influential concepts that utilized tree logic in understanding the relational characteristics of the city. However, it was "modernism" which provided the organicist thought a great deal of leverage on architecture and planning. One of the earliest manifestations of this understanding appeared in the CIAM congresses. The functionalist zoning principles proposed in Athens Charter elevated the influence of organicism to a programmatic level.[6] Up to date, this ontological perspective has had tremendous effects on the endeavor to understand cities, however, there had been several objections along the way, among which one holds particular importance. In 1965, Christopher Alexander published in Architectural Forum an essay titled "A City Is Not a Tree" which immediately gained prominence in architectural circles. The claim was simple; a city could not be conceived as a tree because it was inherently built upon a semi-lattice structure. In this study, to challenge this understanding, the concept of "rhizome" is compared to that of Alexander's "semi-lattice" with respect to contemporary paradigms and tools of architecture and urban design. While Alexander claims that the city is a semi-lattice, this study instead argues that the city should be considered as a rhizome. Although rhizome is proposed as a more contemporary conception in understanding the nature of cities when compared to semi-lattice, the point of departure for both concepts comes from the shared standpoint that cities cannot be treated as trees. The answer to why cities are not trees will be addressed later but why we did ask this specific question in the first hand is as important as an answer that is given to the former. It simply lies behind the conditions under which the built environments of the past and the present are created. Cities are built as tree structures, no matter on which background or school of thought they sit upon. This everlasting condition creates similar environments

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[6] See Le Corbusier, *The Athens Charter*, Grossman Publishers, New York, Trans. by Anthony Eardley, 1973, pp.95-96. Item number 77 and 78 proposes zoning strategies with regard to the functionalist principles.

regardless of varying paradigms, because in essence the built environment is created according to the variations of the same pattern of thought. In theory, of course, the importance of the attempts that question this approach cannot be denied. There exist several studies on how to avoid arborescent thinking especially when socio-political context of the city is concerned yet, the studies against arborescent thinking on the spatial configuration of the city remains restrained. The problem of city building is conceptualized as a problem of sets. However a different perspective based on a set-free system of thinking can open ways to new types of relations and spatial potentials that we are currently unaware of. In this respect, this study is involved in questioning the dominance of the tree-like conception of the spatial structure of the cities on creating the urban formal relational patterns with the insight provided by the concept of rhizome. However before dealing with the possible reflections of trees, semi-lattices and rhizomes on city, it is important to understand them in their plain and simple form. This abstraction is necessary, because; before thinking about buildings and streets, it is important to think about simple relational behaviors of sets of elements that are not bound to the pre-conceptions of city. Hence, in the following paragraphs, trees, semi-lattices and rhizomes will be introduced focusing on their relational characteristics without any connotation regarding urban environments, however this strategy should not intimidate the reader to form analogies with cities while reading them.

II

Basically, trees are systems of elements that are established via principles of hierarchy, however, a tree can be defined in several ways. In this study, we will content ourselves by drawing out two rather general different approaches from two different points of view. The first one being the mathematical approach proposed by Alexander can be considered as an axiom in the set theory. And the second one is an epistemological approach that is developed by the philosophers Deleuze and Guattari. The reason behind this comparison is that

although these two distinct approaches look from two distinct perspectives and disciplines, they end up with the same conclusion that trees are not capable of creating complexities and indeed they cannot be imposed upon inherently complex structures as an organizational model. This means that the tree is not merely a concept that affects our perception of the city as architects and city planners; in fact, it is a multi faceted concept that dominates our thinking as human beings in various fields of study varying from architecture and mathematics to epistemology.

The mathematical axiom of the tree is described by Alexander as follows: “A collection of sets forms a tree if and only if, for any two sets that belong to the collection, either one is wholly contained in the other, or else they are wholly disjoint”[7]. This axiom actually states that in a collection, if there does not exist any overlap among sets; then it forms a tree structure which requires no element of any set is connected to other sets unless the set is connected as a whole. To simplify, it can be said that a tree structure constructs a hierarchy where elements of any set is related only to their superior or subordinate. This characteristic stems from the fact that in a hierarchy, the paths of relations cannot be surpassed by any other rule. These are systems of relations of elements, objects, values, categories, etc. in which the items are represented as being "above," "below," or "at the same level as" one another. This prevents any horizontal relation between the elements of a set apart from the vertical ones that are described above. Deleuze and Guattari share the same view as they criticize tree structures by stating “arborescent systems are hierarchical systems with centers of significance and subjectification, central automata like organized memories”[8]. They argue that in these kinds of models “an element only receives information from a higher unit, and only receives a subjective

[7] Alexander, 1966, op. cit., p.49
[8] Deleuze and Guattari, 2004, op. cit., p.16

affection along pre-established paths"[9]. The hierarchy as the most significant key factor constituting the characteristic of tree structures leads us to several other shortcomings.

First of all, tree structures are so rigid that they do not allow any new sets to connect unless they become a subordinate of an existing set. They are not capable of adaptation, because they require the transformation of the whole structure when the conditions are changed. Secondly, they are genealogical structures, meaning they have a beginning and an end, which results in a descent where the capabilities of any given set depend on the capabilities of the one at the root. And lastly, tree structures lack the structural complexity as they are formed with a single pattern of relationship. They can only generate sub-set relations, which in turn, destroy the possibility of new kinds of interaction between the sets. With all of these constraints that generate the lack of capabilities of trees, it is obvious that trees are not suitable for complex structures that need several relationship patterns other than what they offer.[10]

III

According to Alexander the remedy for all of these deficiencies of the tree model is semi-lattice. He asserts that cities are far more complex structures than trees; therefore they cannot be considered as trees. He blames designers for "proposing and building trees as cities", because they are limited by the capacity of the human mind and they cannot achieve the complexity of the semi-lattice in a single act.[11] At this point, what a semi-lattice is comes to the fore as a crucial question. The mathematical definition states, "a collection of sets forms a semi-lattice if and only if, when two overlapping sets belong to the collection, then the set of elements common to both also belongs to the

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[9] Ibid., p.16
[10] Regarding all of these shortcomings, it does not come as a big surprise that Deleuze and Guattari argue that we should stop believing in trees.
[11] Alexander, 1966, op. cit., p.54

collection"[12]. In other words, this principle states that, in a collection of sets, if there are overlaps; then it becomes a semi lattice. This actually means that an element of a particular set can develop a relationship with other sets while another element of the same set does not necessarily do the same. This characteristic of semi-lattice opens the door for a great deal of possibilities that cannot be expected from tree structures. Firstly, it creates far more types of relationship patterns when compared to trees. Alexander clearly expresses this condition with an example in which he states that "a tree based on 20 elements can contain at most 19 further subsets of the 20, while a semi-lattice based on the same 20 elements can contain more than 1,000,000 different subsets"[13]. This level of complexity cannot be achieved with trees due to the fact that they are inherently built upon the principle of structural simplicity and they are not open to variety. Secondly, the complexity that can be created with semi-lattice breeds the possibility of ambiguities that cannot be foreseen beforehand. Meaning, in contrast to trees, which is to achieve the simplicity by halting the possible relations other than the vertical ones, the semi-lattice allows the elements to form different combinations of sets and horizontal relations that are not determined at the beginning.

Alexander's motive behind proposing the semi-lattice instead of the arborescent models lies beneath the belief that designers cannot achieve the complexity that is needed for complex structures like cities as they are limited by their cognitive capacity. In other words he puts the problem as a matter of design capability of the human mind. For, he categorizes cities as "natural" and "artificial", the former occurring over the course of time and the latter being created by designers and planners.[14] And he asserts that natural cities are in the form of a semi-lattice whereas artificial cities are trees. With this way of

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[12] Ibid., p.49
[13] Ibid.
[14] Ibid., p.47

thinking he proposes that we should let the city grow itself instead of designing it, so that it can be able to display its inherent structure. However in this study it is asserted that, today, "the designers"-as Alexander calls- are capable of creating more complex structures than trees with the help of digital technologies. The developments in computational technologies and data processing abilities provide designers with the tools of creating even far more complex systems than semi-lattices. In this regard, making use of the capabilities noted above, the rhizome is proposed here, as a more complex system than semi-lattice and tree structures to explore the formal properties and capacities of urban environments.

Yet, it should be stated at this point that what is tried here should not be considered as "a search of complexity for the sake of complexity". Complexity is not aimed merely because we are able to, but rather because the very nature of cities necessitates it.

IV

The rhizome that is discussed here is not the biological term used to describe the subterranean stem of a plant, as is the case for the "tree" of Alexander.[15] Rather, it is the concept for a mode of thinking against arborescent thinking proposed by Deleuze and Guattari. As argued by Sutton and Martin-Jones "they [Deleuze and Guattari] attempted to discard the hierarchical image of thought of the tree as somewhat illusory, and replaced it with the horizontal

[15] Nor the rhizome discussed here is a formal analogy to the biological rhizome. The biological rhizome is connoted with network-like structures and if it is taken as a point of reference, any "networky" organization may be considered as a rhizome. However, it should be stated that an organization's being formally network-like does not qualify it as a rhizome in the sense it is discussed here. Likewise, an organization's being formally binary does not necessarily suggest that it is a tree structure. In this study, the discussion on the rhizome and the tree is only about the relationships between elements and it does not involve any formal reference to the biological tree and the biological rhizome.

image of the rhizome"[16]. There exists no clear definition of it in "A Thousand Plateaus", however Deleuze and Guattari had extensively described it and laid down the principles that generate its characteristics.[17]

Basically, the rhizome can be considered as the masterpiece of the post structuralist philosophy of Deleuze and Guattari and the principles involved in the definition of it are in line with this ontological stance. The first principle that they propose is the principle of connection. According to this principle, any point of a rhizome can be connected to any other. This means that an element could form relationships with any other without any overarching rules. In contrast to dichotomous, hierarchical relationships that are present on the branches of tree structures, Deleuze and Guattari state that "a rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences and social struggles"[18]. They criticize the dichotomies of the binary logic that is discussed above in Anti-Oedipus, too:

> "Machines attach themselves to the body without organs as so many points of disjunction, between which an entire network of new syntheses is now woven, marking the surface off into co-ordinates, like a grid. The "either ... or ... or" of the schizophrenic takes over from the "and then": no matter what two organs are involved, the way in which they are attached to the body without organs must be such that all the disjunctive syntheses between the two amount to the same on the slippery surface."[19]

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[16] Sutton, D. and Martin-Jones, D., Deleuze Reframed, I.B. Tauris, London, 2008, p.5
[17] See the entire chapter "Introduction: Rhizome" of A Thousand Plateaus in order to get the whole picture.
[18] Deleuze and Guattari, 2004, op. cit., p.7
[19] Deleuze, G. and Guattari, F., *Anti-Oedipus: Capitalism and Schizophrenia*, University of Minnesota Press, Minneapolis, Trans. by Robert Hurley, Mark Seem, and Helen R. Lane, 1983, originally published in French in 1972, p.12

From this argument, it can be derived that the binary logic of "either/or" is the conjunction that is used to create trees, whereas "and/then" is used to create rhizomes. In this way, the rhizome is able to serve to "overcome, overturn and transform structures of rigid, fixed or binary thought and judgment"[20]. In the second principle, it is claimed that rhizome is heterogeneous by stating homogeneity only occurs when a power takeover by a dominant element is established within a "political multiplicity". The third principle of the rhizome concerns multiplicity, which states that a rhizome cannot be treated as a unity; rather it can only be a multiplicity. Colman argues that the rhizome is any network of things brought into contact with one another for new effects, new concepts, new bodies and new thoughts.[21] Although a unity signifies the togetherness of a number of elements with a certain hierarchical order where every point depends on every other point to maintain its unity, a multiplicity is not constructed upon the interdependence of the relationships between elements, rather; in multiplicities every element is complete in itself and is capable of "regenerating" and "re-growing" itself. The fourth principle is very much related with the principle of multiplicity. The principle of "asignifying rupture" argues that a rhizome may be broken, shattered at a given spot into multiple pieces, but it will start up again on one of its old lines, or on new lines. The rupture and the number of ruptures have no significance and do not signify anything in particular. This characteristic of rhizome qualifies it as an anti-genealogy that has neither a beginning nor an end. The last but not least is the principle of cartography and decalcomania which suggests that a rhizome is not suitable for any structural and generative model, as it is stranger to any idea of "genetic axis" or "deep structure". Unlike "tracing", the rhizome is a

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[20] Felicity, J. C., Rhizome, *The Deleuze Dictionary*, Ed. by Adrian Parr, Edinburgh University Press, Edinburgh, 2010, p.233
[21] Ibid.

"map"[22] which is always detachable, connectable, reversible, modifiable, and has multiple entryways and exits and its own lines of flight. The rhizome is an "acentered, nonhierarchical and nonsignifying system without a "General"[23] and without an organizing memory or central automaton"[24].

V

Having defined the characteristics of trees, semi-lattices and rhizomes, the similarities and differences among them come to the fore as a crucial question. First and foremost, it should be stated again that both the semi-lattice and the rhizome are opposed to arborescent thought. For, it can be considered as the principal reason behind the reading of Alexander's work in relation to Deleuze and Guattari's. Indeed, both are the concepts that are introduced to challenge the shortcomings and inadequacies of structures built upon hierarchical principles. In a world where thinking is confined within the limits of trees, all the characteristics discussed above would qualify semi-lattice and rhizome as non-systems. However, it does not mean that they are not capable of creating systems. They can only be considered as non-systems in a framework where systems other than trees are considered to be incapable of creating meaningful wholes.

However, the two models differ in several respects. One of the most notable distinctions between semi-lattice and rhizome is that rhizome is not a structure. This is because although it is composed of elements that belong to different sets, these elements are conceived as a collection of dimensions. As stated by Deleuze and Guattari, "there are no points or positions in a rhizome, such as

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[22] They discuss that the tracings are like the leaves of a tree, however they consider the map as open and connectible in all of its dimensions.
[23] The word represents dictatorial and hierarchical systems -arborescent- in which an individual only has one active neighbor, his or her hierarchical superior.
[24] Deleuze and Guattari, 2004, op. cit., p.21

found in a structure".[25] In rhizomes elements are not defined according to which set they belong to, rather they are defined according to which other elements they create relations with. In "A Thousand Plateaus", Deleuze and Guattari states:

> "Unlike a structure, which is defined by a set of points and positions, with binary relations between the points and biunivocal relationships between the positions, the rhizome is made only of lines: lines of segmentarity and stratification as its dimensions, and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature."[26]

In this manner, rhizome is a collection of "lines of flights" whose interplay creates the "multiplicities" which are "defined by the abstract line, the line of flight or deterritorialization according to which they change in nature and connect with other multiplicities"[27]. This means that unlike trees and semi-lattices where elements are classified with respect to their sets resulting in the division of the system into discrete components, rhizomes allow the multiplicity of elements in their heterogeneous form with the use of lines of flight. Deleuze and Parnet discuss this phenomenon in Dialogues:

> "A flight is a sort of delirium. To be delirious is exactly to go off the rails (as in *déconner* – to say absurd things, etc.). There is something demonaical [Sic] or demonic in a line of flight. Demons are different from gods, because gods have fixed attributes, properties and functions, territories and codes: they have to do with rails, boundaries and surveys. What demons do is jump across intervals, and from one interval to another."[28]

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[25] Deleuze and Guattari, 2004, op. cit., p.8
[26] Ibid., p.21
[27] Ibid., p.5
[28] Deleuze, G. and Parnet, C., *Dialogues*, Columbia University Press, New York, Trans. by Hugh Tomlinson and Barbara Haberjam, 1987, originally published in French in 1977, p.40

In a rhizomatic system, the lines of flight constantly generate the acts of "deterritorialization" and "reterritorialization" which results in an "assemblage" of elements. This operation continues through infinity because of the fact that the existence of multiplicities is dependent on this principle. This phenomenon is called as "the process of subjectification" by Ballantyne and described as something that could never reach a satisfactory conclusion.[29] This state of inconclusiveness constitutes one of the main characteristics of rhizomes. They are not built upon pre-established aims to be accomplished at the end, because they are inherently never-ending systems. In contrast, the structural systems are created by means of "unity" where elements are categorized according to goals that are decided at the beginning, since they are designed to be able to arrive at a conclusion at the end.

VI

All of the principles listed above are the results of a particular strategy of coming together; namely the "assemblage". In order to evaluate rhizome with its implications on the city, firstly, the notion of assemblage should be focused with its effects on the urban condition. In this regard, assemblage, as a whole that is constructed from elements that are thought to be unlikely to come together is the key to understand the rhizomatic formations in which sets lose significance in contrast to tree and semi-lattice structures. In trees, the role of the element in the system is decided with regard to one and only one variable – the set it belongs to-and the element is positioned in the system according to this rule of thumb. In semi-lattices, this principle is a bit flexible but still the sets that contain homogeneous elements exist. However in rhizomes, the notion of set disappears because, what becomes significant is the relationship that elements establish with others. Still, an element can belong to a set; however, it turns out to be not the driving force that determines the relationship with others

[29] Ballantyne, A., *Deleuze and Guattari for Architects*, Routledge, London, 2007, p.78

anymore. In rhizomatic systems, the relationship of an element with an element of different kind is as valuable a relationship as with an element of the same kind. It is this set-free understanding that allows lines of flight to form assemblages made up of heterogeneous elements of whose aggregate creates rhizomes.

Hence, it is claimed here that architects and planners should not read or design urban environments with approaches that attribute significance to set-dependent relational patterns. Instead, they should approach every element separately from each other although they belong to the same set and evaluate them according to the possibilities of relations with other kinds of elements. The difference between set-dependent and set-free strategies can be best illustrated with the following example in which we speculate on “buildings”. In tree or semi-lattice logic, all of the “buildings” are categorized as a “set”, as with what is done to streets, parks, open spaces etc. Then, sub-sets are created according to different typologies such as point block, perimeter, row, and high-rise, which results in structures that employ principles of hierarchy. However, in contrast to this approach, in rhizomes there would not exist sets named “buildings” and “streets”; instead every part that constitutes the built environment would behave separately without categorization of any kind. Through assemblage, a rhizomatic environment would benefit from principles of heterarchy, in contrast to the principles of hierarchy utilized in urban environments built upon tree and semi-lattice logic. In this regard, this study can be considered as a proposal to address the principles of a world of imagination where set-related patterns of relationships do not exist. To this end, here, it is aimed to develop a methodology that approaches every constituent element of urban environments separately from one another and evaluate them according to the possibilities of relations with one another.

CHAPTER M

NEO-NEO-ASSEMBLAGE THEORY

> "Readers who feel that the theory developed here is not strictly speaking Deleuze's own are welcome to call it 'neo-assemblage theory', 'assemblage theory 2.0', or some other name."[30]

This chapter aims to engage in a research on the theory of assemblage and arrive at a new interpretation, which can be utilized in both the analysis of the existing urban formal relational patterns; and the creation of new ones. The concept of assemblage proposed here is neither the concept developed by Deleuze [and Guattari][31], nor it is the one that is developed by DeLanda. In fact, it is a research that benefits from the terminology developed by Deleuze and DeLanda for their assemblage theory and utilizes those in novel frames of references that are not intended by their authors. While, Deleuze uses assemblage in a philosophical inquiry that aims to figure out the ontology of "things" without any specific content, DeLanda takes this conception and

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[30] DeLanda, M., *A New Philosophy of Society: Assemblage Theory and Social Complexity*, Continuum, London, 2006, p.2

[31] Although the two elaborated on the theory of assemblage together, there exist several other studies by Deleuze. Hence, from now on, we will only refer to Deleuze.

develops it into a theory that aims to understand the "social ontology". However, in this study, we aim to explore the "formal ontology" of urban environments with the insight provided by Deleuze's and DeLanda's assemblage theories. In this regard, this study can be considered simply as a transcription of the theory of assemblage to understand and explore the formal characteristics and potentials of urban environments.

II

To start with, it will be helpful to draw a picture of assemblage with the example given by MacGregor Wise. In simpler terms, he illustrates the term assemblage with an example of a plastic model aeroplane. According to him "an assemblage is not a set of predetermined parts (such as the pieces of a plastic model aeroplane) that are then put together in order or into an already-conceived structure (the model aeroplane); nor is an assemblage a random collection of things, since there is a sense that an assemblage is a whole of some sort that expresses some identity and claims a territory"[32]. In this sense, assemblage can be considered as a mode of collection of things coming together without the inter-dependence of parts where multiplicities from different media create meaningful wholes. According to O'Sullivan, "it implies a contact, and movement, between different milieus and registers, between areas that are usually thought of as distinct and discrete"[33]. In fact, this characteristic qualifies assemblages as the strategy by which rhizomes are created. Hence, in this study, assemblage theory is utilized to develop a methodology that can serve as a basis in arriving at rhizomatic urban environments. As rhizome is basically a model that does not suggest a

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[32] Wise, J. M., Assemblage, *Gilles Deleuze: Key concepts*, Ed. by Charles J. Stivale, Acumen, Durham, 2005, p.77

[33] O'Sullivan, S., *Art Encounters Deleuze and Guattari: Thought Beyond Representation*, Palgrave Macmillan, New York, 2006, p.17

methodology by itself, the engagement into rhizomatic models necessitates the involvement into the assemblage theory.

III

What is done here is also a kind of an assemblage through which we aim to get into contact with other multiplicities. Hence, this study can be considered as an assemblage in the making of a new interpretation of assemblage theory. In this manner, the aim of this research coincides with the convictions of the editors of the celebrated journal Assemblage.

> "Dealing adequately with architecture and its worldly condition must often involve crossing institutionally defined disciplinary boundaries. Though every interpretation is inscribed in an already constituted field of discourse, we must refuse to be satisfied with merely further refinements of what is given or defined, with the constant reaffirmation of an agreed-upon canon of works, interpretations, or conceptual systems. Normative standards of practice can be coercive as well as productive; and disciplinary boundaries are all too often designed to maintain the *status quo. Assemblage* is a format for *oppositional* knowledge – knowledge that continually questions received ideas, that challenges entrenched institutions and values, that strays from permissible terrain."[34]

Straying from permissible terrain and transcending the disciplinary confines, requires insight from other fields of study; hence, "[the notion of assemblage] suggests borrowed and transformed material, from history, literary criticism, philosophy, politics; it suggests heterogeneity, collision, incompleteness"[35]. In accordance with this strategy, in this research we are trying to borrow the concept of rhizome and transform it into a model with the use of another

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[34] Hays, K. M. and Kennedy, A., About Assemblage, *Assemblage,* No.1, The MIT Press, Cambridge, MA, October 1986, pp.4-5. Retrieved from: http://www.jsor.org/stable/3171050

[35] Ibid., p.5

borrowed concept, assemblage. This kind of approach, which incorporates different modes of knowledge from other fields of research, has always been valid for architecture and planning and it will continue to be so for years to come. This does not mean that architecture and planning are not capable of breeding their own concepts and models; however, we believe that they should connect with other multiplicities to change in nature and to offer new perspectives of research.

IV

So far, we have argued the viability of the assemblage approach to bring about a new perspective for architecture and planning. Now we shall attempt to discuss the ontological foundations on which assemblage theory is established. First of all, the assemblage thought is an ontological perspective that investigates the categories of being and classes of entities. It is a theory which proposes that entities cannot be categorized with oppositional models of thought - like Hegelian dialectics-; rather, the collection of entities should be seen as multiplicities coming together to cause new multiplicities emerge. In this manner, it is the theory of "becoming" rather than being, where movement and change occupies a significant role. As becoming assumes a "changing to" and a "moving towards", it creates a dynamic ground where different entities amalgamate into each other. Secondly, it is a theory that does not refer things as "wholes"; instead, it champions the plurality of things coming together. Hence, it can be considered as an approach that deals with "parts" and their relation to each other.[36] When this kind of thinking is utilized to understand urban spatial characteristics of cities, several questions pop up among which a particular one holds much importance: Do cities spatially exist as wholes and what are the parts that constitute them? In fact these questions are asked by

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[36] See DeLanda M., Sandstone and Granite, *A Thousand Years of Nonlinear History*, Swerve Editions, New York, 2000, pp.57-70. The discussion on "hierarchy" and "meshwork" provides a significant insight for part-whole issue.

architects and planners and there happen to exist many theories on this issue. It is obvious that there are several approaches that read cities as a collection of parts; however assemblage theory that is discussed here, differs in determining what those constituent parts to be. In this manner, it challenges the understanding that read the constituent parts of cities as zones of programmatic difference and offers a new perspective for both reading and designing cities.

V

The word assemblage has a lot in common with collage and montage in the sense they are used in art.[37] Assemblage, along with collage and montage, refer to the same process by which a composition incorporating various materials or elements is created. In fact, they, all, are processes of art production where a collection of things that are thought to be unlikely to each other creates a composition. In this manner, regarding their close ties to each other, it becomes necessary to focus on the collage and the montage with their possible consequences on the assemblage theory developed here. However, in this study, it is not aimed to discuss collage and montage regarding their interpretations in various art forms, rather, it will be attempted to dwell on the translations of these processes into architecture and planning. So, we will benefit from two significant treatises on collage and montage, which are developed to understand the urban condition. In doing so, we hope to reveal the similarities and discrepancies between the assemblage theory proposed here and the use of the collage and the montage by Rowe and Tschumi, successively.

"The Collage City" -the theoretical treatise by Rowe and Koetter- offers a critical analysis of modernist urban planning with regard to its utopian ideals.

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[37] In art, the assemblage is considered to be the three dimensional equivalent of the collage; and, the montage is regarded as the counterpart of the collage and assemblage in photography, film and video.

The modernism's desire to start anew from scratch and design the utopian city that has nothing to do with the past is criticized to be a dull approach and, furthermore, the tradition of modern architecture is accused of conceiving the society and the city in "highly conventional artistic terms", such as "unity, continuity and system".[38] In contrast to this understanding, with the translation of the term collage, it is proposed that architecture and urban planning should be capable of incorporating historical references. As opposed to modernist utopian approach, Rowe and Koetter propose that the city should be conceived as a collage which is assembled from diverse set of entities from past, present and future. According to them, the city is an aggregate of discontinuous fragments re-situated in new contexts. They argue that, through the use of collage "objects and episodes are obtrusively imported and, while they retain the overtones of their source and origin, they gain also a wholly new impact from their changed context"[39]. Traces of this non-linear view of history can be found in Rowe's "The Mathematics of the Ideal Villa", where he compares villas of Palladio and Le Corbusier by means of compositional principles that transcend historical bounds, although they belong to historically discrete contexts. In this respect, collage offers a trans-historical perspective where disparate objects are held together by various means:

> "For, collage, often a method of paying attention to the left-overs of the world, of preserving their integrity and equipping them with dignity, of compounding matter of factness and cerebrality, as a convention and a breach of convention, necessarily operates unexpectedly. A rough method, 'a kind of *discordia concors;* a combination of dissimilar images, or discovery of occult resemblances in things apparently unlike."[40]

This theoretical framework embraces the heterogeneous nature of the cities as

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[38] Rowe, C. and Koetter F., *Collage City*, The MIT Press, Cambridge, MA, 1984, p.138
[39] Ibid., p.140
[40] Ibid., pp.142-143

it reads urbanism through the formal processes of fragmentation and superimposition.

The use of these processes and several others reveals itself in the works Tschumi too, but this time they are employed for a different agenda. Tschumi uses these processes to explore the relations between "spaces" and "events" and "movements". While doing so, he benefits from montage techniques taken from cinema and incorporates them into the design problems of the organization of program. The "event montage" enables him to examine the relationship between space and its use in a sequential nature. The sequence as "a composite succession of frames that confronts spaces, movements and events, each with its own combinatory structure and inherent set of rules"[41] serves to create meaning; a meaning that "does depend merely on a single frame […] but on a succession of frames and spaces"[42]. Hence "frames can be mixed, superimposed, dissolved, or cut up, giving endless possibilities to the narrative sequence" with the formal strategies of "repetition, disjunction, distortion, dissolution, or insertion" [43] to reveal the transformational capacities of the sequential nature. In other words, through the use of "a montage of sequences and frames …[like] a film strip"[44], the complex relationship between space, event and program is explored.

In essence, both the "collage city" of Rowe and the "montage" of Tschumi, along with the assemblage theory that we propose here is the variations of the same pattern of thought, in which particular elements are appropriated into novel constellations. However, characteristics peculiar to each, qualify them as three distinct approaches that offer three distinct perspectives. Rowe's collage

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[41] Tschumi, B., *The Manhattan Transcripts,* Academy Editions, London, 1994, p.10
[42] Ibid., p.11
[43] Tschumi. B., *Architecture and Disjunction,* The MIT Press, Cambridge, MA, 1996, p.166
[44] Tschumi, B., Cinégramme Folie: Le Parc De La Vilette, Princeton Architectural Press, Princeton, 1988, p.8

strategy finds its origins in history; meaning, although it is a trans-historical approach, it is "historically motivated"[45]. In this regard, it differs from neo-neo-assemblage theory where the focus of interest is not concentrated on history bound reading of architecture and planning. It is an inquiry that aims to reveal the formal potentials of urban environments without historical references of any kind. In other words, constituent parts of the urban environments are not categorized according to a historical reference system, rather, they are considered as they are in present time with no attribution of significance to time. However, it should be stated that the collage and the assemblage are both formal readings of the cities and they aim to explore the formal characteristics of the urban environments, focusing on the properties and the capacities of the urban form. Concerning this, the event montage of Tschumi can be considered as a different approach where the focus of interest is shifted to the event and its relation to the space.

VI

Before getting engaged in the discussion on Deleuzian assemblage, the distinction between the terms assemblage and *agencement* should be made. Assemblage is the word that is used to refer to the French word *agencement* in the translation of Deleuze and Guattari's work into English. One of the earliest attempts to translate Deleuze's use of the term *agencement* appears in the first translation of the article "Rhizome" by Paul Foss and Paul Patton in 1981.They used the English term assemblage and it is retained in Brian Massumi's later English version of "Rhizome" as the "Introduction" of "A Thousand Plateaus". According to Phillips, after these early attempts, "many (by no means all) translators and commentators have agreed, in a loose consensus, to keep to this early translation of *agencement* by assemblage, while acknowledging that the

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[45] Hays, M., *Architecture Theory since 196*8, The MIT Press, Cambridge, MA, 1998, p.89

translation is not really a good approximation".[46] Indeed, *agencement* is generally used to refer to "the way in which the parts of something are arranged or laid out", while assemblage denotes "a collection or gathering of things". However, the two words correspond to two different characteristics of the theory of Deleuze and Guattari, although the translation cannot be considered as a good approximation. On the first hand, by referring to the means with which the parts come together, the word *agencement* responds to the will of Deleuze and Guattari who attribute significance to the connection between the things rather than the things itself; because "*agencement* designates the priority of neither the state of affairs nor the statement but of their connection, which implies the production of a sense that exceeds them and of which, transformed, they now form parts"[47]. On the other hand, the word assemblage corresponds to the heterogeneity of elements, as it refers to the collection of distinct and discrete things. In this manner, the translation of *agencement* into English as assemblage covers a unique dimension of the theory of Deleuze while, somehow, maintaining the original meaning. Furthermore, the term assemblage suggests a new framework for discussion, as it is closely associated with collage and montage which are discussed before.

VII

As a central piece to his theory, Deleuze abundantly described assemblage in several works and determined the conditions under which a collection of things can be considered as an assemblage. First of all, the assemblage is composed of heterogeneous elements that are unlikely to come together. It is what keeps very heterogeneous elements together. According to Deleuze:

> "It [assemblage] is a multiplicity which is made up of heterogeneous terms and which establishes liaisons, relations

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[46] Phillips, J., *Agencement*/Assemblage*, Theory, Culture &Society*, Vol.23, Sage, New York, 2006, p.108
[47] Ibid.

> between them, across ages, sexes and reigns different natures. Thus the assemblage's only unity is that of a co-functioning: it is a symbiosis, a "sympathy". It is never filiations which are important, but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind."[48]

It brings together "a sound, a gesture, a position, etc."[49], elements that are thought to be unfamiliar to each other and provides that elements of this non-homogeneous collection converge. It makes elements that belong to different regimes –natural or artificial- function together. Assemblages may incorporate elements of several kinds bringing together "human, social, and technical machines, organized molar machines [and] molecular machines with their particles of becoming-inhuman"[50] to assemble in heterogeneity. They are inhabited by "becomings and intensities, by intensive circulations, by multiplicities of every kind" which include "packs, masses, species, races, populations".[51] Assemblages have "neither base nor superstructure, neither deep structure nor superficial structure" and they flatten "all of its dimensions onto a single plane of consistency upon which reciprocal presuppositions and mutual insertions play themselves out"[52]. This principle is very much related with the discussions on the set theory. In fact, assemblages abort sets of different kinds in search of co-functioning; unlike structures, which are linked to the conditions of homogeneity. In assemblages "there are no more forms but cinematic relations between unformed elements; [and] there are no more subjects but dynamic individuations without subjects, which constitute collective assemblages"[53]. This prevents assemblages from turning into systems based on hierarchical relationships. And finally, "assemblages are in

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[48] Deleuze and Parnet, 1987, op. cit., p.69
[49] Deleuze, G., *Two Regimes of Madness*, Ed. by David Lapoujade, Trans. by Ames Hodges and Mike Taormina, Semiotext(e), New York, 2007, p.179
[50] Deleuze and Guattari, 2004, op. cit., p.36
[51] Deleuze, 2007, op. cit., p.82
[52] Deleuze and Guattari, 2004, op. cit., p.90
[53] Deleuze and Parnet, 1987, op.cit., p.93

constant variation, [and they] are themselves constantly subject to transformations" [54]. They create groups of connections and multiple intersections between different milieus and registers, which then serves as the point of departure for other assemblages. This prevents assemblages from acting on static points and positions; rather, they operate between intermingling bodies.

VIII

In short, all of these principles point out to a simple ontological stance. The idea that "a thing" cannot be known with reference to itself, that it can only be understood with regard to other things it establishes relations with can be considered as the reason behind Deleuze's eternal commitment to assemblage. He argues that "we know nothing about a body until we know what it can do, in other words, what its affects are, how they can or cannot enter into composition with other affects, with the affects of another body, either to destroy that body or to be destroyed by it, either to exchange actions and passions with it or to join with it in composing a more powerful body"[55]. This understanding bears considerable significance because the principles of assemblage discussed above are profoundly associated to this basic principle.

Deleuze's theory is meant to be employed in understanding a wide variety of collections constructed from heterogeneous parts. His assemblage theory may be utilized to understand systems of various scales ranging from the smallest to the largest one can imagine. However, it is DeLanda, who elaborated on the Deleuzian theory and developed a new version that concentrates on social ontology.

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[54] Deleuze and Guattari, 2004, op. cit., p.82
[55] Deleuze and Guattari, 2004, op. cit., p.257

As, anything about social ontology has something to do with the city, DeLanda's inquiry can be considered as a theory of urbanism as well. However, considering the scope of this study, it is not intended to dwell on his theory in particular, however, it is aimed to focus on one of his reformulations of the Deleuzian principles, which would be utilized in the neo-neo-assemblage theory. To this end, "the relations of exteriority/interiority" that DeLanda uses in understanding the "social complexity" is going to be re-situated in a new context that is meant to explore the formal complexity of urban environments.

IX

The concept of relations of interiority/exteriority is proposed by DeLanda to distinguish between structures in which elements have no independent existence apart from their relations and assemblages where elements have an existence independent from the system they take part in. The concept of relations of interiority suggests that "the component parts are constituted by the very relations they have to other parts in the whole" and "a part detached from such a whole ceases to be what it is since being this particular part is one of its constitutive parts"[56]. In other words, relations of interiority are the relations in which the components that are related do not exist independently from the relation in which they take part. In fact, this kind of a relational characteristic promotes the organist conception of collections where parts should work together like organs in an organism to achieve consistency since parts cannot claim existence independent from the whole they belong. DeLanda proposes that this conception should be abolished as components do; indeed, have existence independent from the relations they take part in. He argues:

> "Allowing the possibility of complex interactions between component parts is crucial to define the mechanisms of emergence, but this possibility disappears if the parts are

[56] DeLanda, 2006, op. cit., p.9

> fused together into a seamless web. Thus, what needs to be challenged is the very idea of relations of interiority. We can distinguish, for example, the properties defining a given entity from its capacities to interact with other entities. While its properties are given and may be denumerable as a closed list, its capacities are not given– they may go unexercised if no entity suitable for interaction is around –and form a potentially open list, since there is no way to tell in advance in what way a given entity may affect or be affected by innumerable other entities."[57]

Here, DeLanda distinguishes between "properties" and "capacities" where the former denotes the characteristics of a given entity defined with regard to the interaction with other entities; however, the latter stands for characteristics that are not exercised till other entities suitable for relation come across. Furthermore, he argues that relations of interiority can only generate "properties". Thus, he proposes that assemblages are characterized by relations of exteriority in contrast to organic totalities generated by relations of interiority. One of the constituent features of relations of exteriority is that "a component part of an assemblage may be detached from it and plugged into a different assemblage in which its interactions are different".[58] Relations of exteriority also suggest that "the properties of the component parts can never explain the relations which constitute a whole"[59]. As cited by DeLanda from "Empiricism and Subjectivity", this feature implies that "relations do not have as their causes the properties of the [component parts] between which they are established"[60]. Thus, the collection of entities that are initiated with relations of exteriority transcends the confines that are generated by relations of interiority. This qualifies assemblage as a new way of reading things that focuses on the capacities rather than the properties.

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[57] Ibid., p.10
[58] Ibid., pp.10-11
[59] Ibid., p.11
[60] Ibid.

Thus, in order to utilize assemblage in understanding the formal capacities of urban environments; first, one should define the parameters that generate the relations of interiority and exteriority acting upon formal relational patterns. Addressing these would mean to reveal the conditions that turn cities into organic totalities and prevent them from transforming into rhizomatic assemblages.

CHAPTER V

ESSENCE AND EMERGENCE

> "From a certain point of view, in fact, the possible is the opposite of the real, it is opposed to the real; but, in quite a different opposition, the virtual is opposed to the actual. We must take this terminology seriously: The possible has no reality (although it may have an actuality); conversely, the virtual is not actual, but as such possesses a reality."[61]

This chapter aims to accommodate an abstract spatial thinking while focusing on formal spatial interplay of elements of urban environments. To do so, it is proposed here that relations of interiority that prevent elements from inter-category combinations should be abolished in favor of relations of exteriority by which urban relational patterns based on assemblage logic can be created. This is only possible when the conditions behind relations of interiority and exteriority are defined. Through this strategy, it is hoped that the mechanisms that lead to the ongoing hierarchization or possible heterarchization of urban environments could be revealed. To this end, two axioms are proposed to be utilized in identifying the effect of varying conditions on the production of relations of interiority or exteriority:

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[61] Deleuze, G., *Bergsonism*, Zone Books, New York, Trans. by. Hugh Tomlinson and Barbara Habberjam, 1988, originally published in French in 1966, p.96

1- Elements cannot be categorized into kinds/sets.
2- The possible relationship between two [or more] elements cannot be anticipated unless they are brought together.

These two are to be dwelled upon in detail afterwards; however, for now, it should be stated that these are the principles to be used to analyze the factors of varying kinds with their role in creating structures built upon arborescence logic or systems created via rhizomatic principles.

II

The first axiom is very much related to the concepts of essence and multiplicity; hence, it will be useful to give a brief account of essentialism with regard to its effects on the categorization of sets. Basically, essentialism is the view that proposes there exists a set of particularities, which are necessary to the identity of a specific entity. According to this view:

> "The essence of a thing is that which explains its identity, that is, those fundamental traits without which an object would not be what it is. If such an essence is shared by many objects, the possession of a common essence would also explain the fact that these objects resemble each other, indeed, that they form a distinct natural kind of things."[62]

This implies that, a two-fold strategy is utilized in essentialism. In the first step, certain particularities are attributed to an entity and in the second step; as a result of this attribution of essence, other entities sharing the same particularities are categorized into a kind/set. As opposed to this concept that is constructed upon essences, "multiplicities specify the structure of spaces of possibilities, spaces which in turn, explain the regularities exhibited by

[62] DeLanda, M., *Intensive Science & Virtual Philosophy*, Continuum, London, 2002, p.9

morphogenetic processes"[63]. In simpler terms, in the concept of multiplicity, sets are not defined by "essential traits" embedded in entities, but rather, common "historical processes" that entities undergo define them. In other words, this view rejects the role of essences attributed to entities in the creation of sets; instead, it promotes the shared historical process as the reason behind. This argument suggests that if this historical process changes for some reason, than the entities involved should have the ability to adapt to the new conditions, as they do not have essential traits to prevent them to do so. In this regard, in the lack of a priori essences, it is only varying conditions to which entities are subjected to, that matter.

Concerning our inquiry, this argument provides a significant insight in understanding urban form and its possible transformation. It makes us question whether different sets exist because the constituents of urban environments have certain essences that are indispensable to them, or are sets created merely because entities have been undergoing the same process. Does "buildings as a set" have essences necessary to their identity or do we consider it as a set because all the buildings are gone through the same process throughout history. If the latter holds true, then, the "buildings" cannot be considered as a set anymore, when the conditions that validated its existence are changed. Instead, the elements constituting the buildings may turn into multiplicities that display an indefinite number of capacities to form relations with other entities.

III

This discussion brings us to the second axiom, which proposes that the possible relationship between two [or more] elements cannot be anticipated unless they are brought together. This is because entities may perform emergent behaviors in which behavior of the system is not described by the individual entities involved. It is this characteristic that qualifies emergent behaviors, as an agent

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[63] Ibid., p.10

to trigger unexpected results that cannot be foreseen beforehand. To be more clear, a famous example of an emergent behavior may be useful where the relation between water and its constituents –oxygen and hydrogen- is examined. Although water is produced by the interaction between hydrogen and oxygen, it "has properties that are not possessed by its component parts: oxygen and hydrogen are gases at room temperature while water is liquid" and "water has capacities distinct from those of its parts: adding oxygen or hydrogen to a fire fuels it while adding water distinguishes it"[64].

In this example, DeLanda uses "properties" as the actual and "capacities" as the non-actual characteristics of the water and to illustrate this distinction, he makes use of another example where he examines the properties and capacities of a kitchen knife:

> "A kitchen knife may be either sharp or not, sharpness being an actual property of the knife. We can identify this property with the shape of the cross section of the knife's blade: if this cross section has a triangular shape then the knife is sharp else it is blunt. This shape is emergent because the metallic atoms making up the knife must be arranged in a very particular way for it to be triangular. There is, on the other hand, the capacity of the knife to cut things. This is a very different thing because unlike the property of sharpness, which is always actual, the capacity to cut may never be actual if the knife is never used. In other words, a capacity may remain only potential if it is never actually exercised."[65]

In this regard, the concept of emergence offers a novel perspective in understanding not only properties but also capacities of entities. This concept successfully proves that entities may have capacities that are never exercised unless another entity "to effect or to be effected" comes over and it makes us question whether there exist capacities of constituents of urban environments

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[64] DeLanda, M., *Philosophy and Simulation: The Emergence of Synthetic Reason*, Continuum, London, 2011, p.1
[65] Ibid., pp.3-4

that are not performed due to effects of the concept of essentialism. In other words, does categorization of elements into sets prevents them to display their emergent capacities in creating formal relational patterns. And, in conjunction with that, could it be of use to change the historical processes that elements undergo in exploring these emergent capacities. If the answer to both questions is a "yes" then this argument suggests that elements should be ripped off from their essences to stray away from essentialism and the historical process that they undergo should be changed to exercise the capacities that they possess. Therefore it becomes necessary to define both the conditions behind relations of interiority by which the concept of essentialism is legitimized and the strategies through which capacities generated by relations of exteriority are exercised.

IV

The conditions that generate relations of interiority are numerous, however, we would like to mention some of them that we think is the most significant in determining the characteristics of urban form. Here, we will not dwell upon them in detail, however, the property ownership patterns and urban codes should be indicated in particular as the major forces that bring about urban relational patterns to form structures derived from the principles of hierarchy along with several other forces including complex social, political, cultural and economic mechanisms. These cause elements of urban environments to take form in a particular way that results in trees.

To avoid this ever-lasting situation, it is asserted here that they should be abolished in favor of an abstract spatial thinking where the formal spatial interplay of constituent elements of the urban environments play the most significant role. If this operation were performed, the effect of these conditions on capacities of the elements to be exercised through relations of exteriority would be eliminated.

Once these conditions are eliminated, then the focus of interest shifts to the strategy through which capacities could be exercised. This strategy is what Terzidis calls "permutation architecture". As capacities are emergent, exploration of them requires a strategy where all of the possible configurations are tested out. In this manner, this kind of a strategy offers a shift from a "world with its intentions, mistakes and aspirations, etc. a world we have been familiar with for over a thousand years" to a world which crosses "the line between predictable and unpredictable".[66] It employs random configurations in exploring capacities because, in this understanding, design is defined as a problem of permutations. Terzidis utilizes the example of solving a puzzle to illustrate the distinction between conventional logic and permutation logic:

> "Now let's implement this theory using a simple human task, that of solving a puzzle. Suppose that you are presented with a puzzle composed of ten pieces that eventually fits into a rectangular canvas. Any human, consider for example a child, will start by selecting the first piece placing in the canvas, then the next one and place it, then the next and so on until either all pieces match or in case there is a impasse, take out a piece or two and rearrange until a match is found. This process may take a few seconds or minutes depending on the complexity of the puzzle or the capabilities of the solver and it is considered as a task of human intelligence, or intelligence in general. Now consider the following possibility. I take the pieces of the puzzle and toss them in the air, let them fall and hope that a match is found. If it does not work I do it again; and again; and again. Over and over; hoping for a match. What are the chances that a match will occur?"[67]

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[66] Terzidis, K., Digital Culture and Permutation Architecture, *Rethinking the Human in Technology Driven Architecture*, Ed. by Maria Voyatzaki and Constantin Spiridonidis, paper presented at European Network of Heads of Schools of Architecture & European Association for Architectural Education International Conference: Rethinking the Human in Technology Driven Architecture, Charis Ltd., Thessaloniki, 2012, pp.60-61

[67] Ibid.

If enough time is spent and all the possible configurations are tried out, it is possible that a match will occur. Here, we propose almost the same thing for urban environments. We propose to decompose the elements of the urban environments, to rip them off from their essences, to put them in a basket, to toss them in the air and to see what happens. Although operations involved in this process are more or less the same with the ones employed in solving Terzidis's puzzle, there exist two fundamental distinctions between the two. Firstly, in Terzidis's method all the permutations are explored to arrive at "the perfect match", a match whose fitness evaluation criteria are determined prior to the process. In this fashion, all the permutations other than the perfect match are called "unsuccessful attempts" as they do not meet the requirements established before. However, in the strategy that is proposed here, all permutations are valuable in the sense that every one of them may display emergent capacities that cannot be known beforehand. It sits on the assumption that only if the constituent elements are behaved according to the process described above; they would be presented with a chance to display their capacities. Otherwise, meaning in the absence of permutations, emergent capacities may never be exercised. Hence, this strategy requires the exploration of as much permutations as possible to uncover the occult characteristics of capacities.

Secondly, Terzidis perceives the permutation strategy as a design method. In other words, he proposes permutations to be incorporated into design as a different process opposed to the conventional one, which includes "a sequence of actions", based on subjective intuitions.[68] However, it is argued here that the permutation strategy should not be seen as a design method; rather it should be conceived as a prequel to design. It should be considered as a strategy by which capacities are examined and utilized as an input for design.

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[68] Ibid., p.58

VI

To conclude, we would like to turn back to our assumption where we argue that the conditions that generate relations of interiority should be abolished in favor of an abstract spatial thinking. As we propose that property ownership patterns, urban codes along with various social, political, cultural and economic mechanisms that are actual to cities should be eliminated, one could argue that the divorce from all these conditions would mean to break away from reality. We shall respond to this argument with another Deleuzian concept: virtuality. As opposed to actuality, virtuality offers a unique perspective in understanding the logic behind this strategy. In this regard, what is tried here should be regarded as the virtual that is fully real, since "the virtual is opposed not to the real but to the actual"[69]. The virtual defines a process in which a potentiality is explored in a number of different ways by "encircling the actual" [70] In this sense, the virtual does not represent something actual; however, it creates a new reality that is not instantiated yet. Deleuze explains this integral status of virtuality to reality in "Difference and Repetition":

> "[…] the virtual must be defined as strictly a part of the real object - as though the object had one part of itself in the virtual into which it plunged as though into an objective dimension. […] The reality of the virtual consists of the differential elements and relations along with the singular points which correspond to them. […] We must avoid giving the elements and relations which form a structure an actuality which they do not have, and withdrawing from them a reality which they have. We have seen that a double process of reciprocal determination and complete determination defined that reality: far from being undetermined, the virtual is

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[69] Deleuze, G., *Difference & Repetition*, Columbia University Press, New York, Trans. by. Paul Patton, 1995, originally published in French in 1968, p.208

[70] Deleuze, G. and Parnet, C., *Dialogues II*, Columbia University Press, New York, Trans. by Hugh Tomlinson and Barbara Haberjam, 2007, originally published in French in 1977, p.148

completely determined."[71]

Thus, reconceptualizing the real in a new context, the concept of virtuality offers architecture -and planning- "the idea of an indeterminate, unspecifiable future, open-endedness, the preeminence of futurity over the present and the past, the promise not of simulation (which is a repetition, representation, or re-production of a real or an original […]) but of (temporal) displacement, not simply deferral but endless openness".[72]

[71] Deleuze, 1995, op. cit., pp.208-209
[72] Grosz, E., Architecture from the Outside: Essays on Virtual and Real Space, The MIT Press, Cambridge, MA, 2001, p.88

CHAPTER I

TREEVILLE AND RHIZOMEVILLE

This chapter aims to discuss the ongoing hierarchization and possible heterarchization of urban environments with the use of a hypothetical exercise. Via this exemplary study, it is intended to examine the processes that generate cities of hierarchy, along with means that would change them into cities of heterarchy. In doing so, first, the existing urban condition has been conceptualized as the treeville and transformation of it has been conceptualized as the "rhizomeville". Here, what is referred as the treeville is a simulation of an urban environment that is designed with regard to the forces that are more or less actual to every city, while, the rhizomeville is the configuration that is obtained by the transformation of the treeville. The elements that are utilized in both of the configurations are the same, however, strategies employed in getting them together differ. While the former is obtained by replicating the historical process that elements of urban environments have undergone throughout history, the latter is produced by changing this particular history of coming together, while focusing on the formal capacities of elements. By means of this strategy, it is believed that the formal capacities of urban environments can be revealed.

As noted earlier, treeville is a reproduction of the city, as we know it. Hence, anything peculiar to the city is valid for it too. Various social, political, cultural

and economic processes play a part in determining its form and these reveal themselves in various forms. In this manner, designing a treeville is an activity whose boundaries are defined by predetermined actualities of various kinds. These predetermined actualities such as property ownership patterns and urban codes, bring about the hierarchization of urban form at various levels. The street patterns, along with property ownership patterns, play a role in the creation of islands and plots. Once these sets are created, urban codes, such as maximum height and setback lines, are utilized in defining the relationship between these sets. These, along with some other factors like floor area ratios and gross floor areas are utilized in defining the mass configuration of the buildings. This reduces the role of the architect merely to determine the form of another set. In this model, no element of a set can develop a relationship with others, unless all the elements of that particular set do the same. [Figure 1,2]

However, in rhizomeville, no one of the predetermined actualities discussed above is present. In that sense, it is an exercise, which incorporates an abstract spatial thinking with a focus on the formal spatial interplay of elements. To this end, it has to break away from the conception that categorizes elements into sets; hence, it requires the decomposition of the sets involved in the creation of the treeville. [Figure 3]

In rhizomeville, elements are ripped off from their essences and the historical process that they have undergone is changed by the permutation strategy where random configurations[73] in space are utilized to explore the capacities. [Figure 4,5,6,7,8] Only a few of these configurations are included in this thesis, however, it should be stated that as much permutations as possible should be tested out to reach a thorough exploration.

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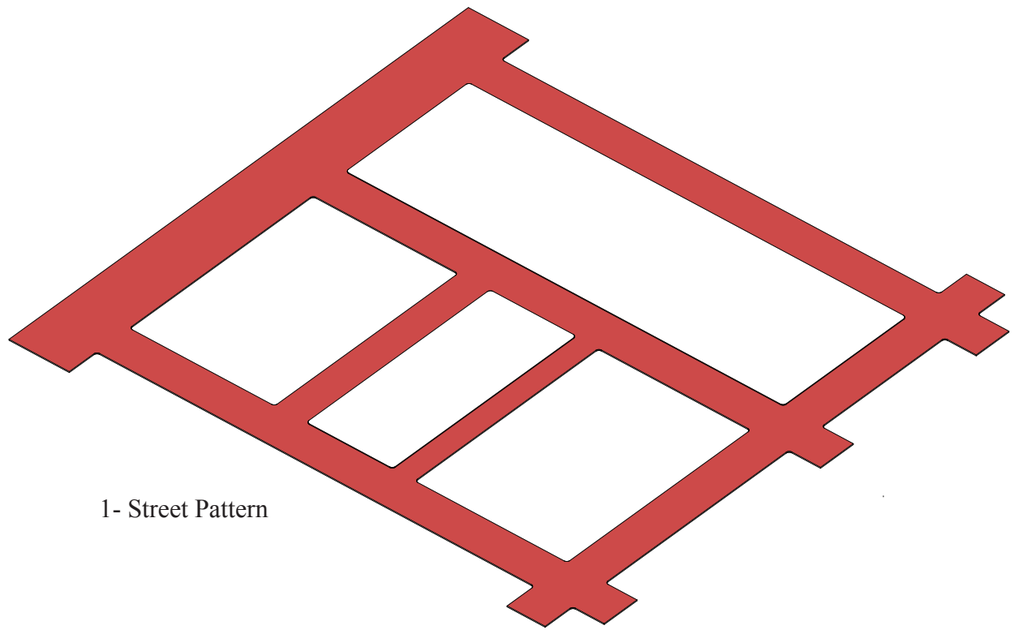
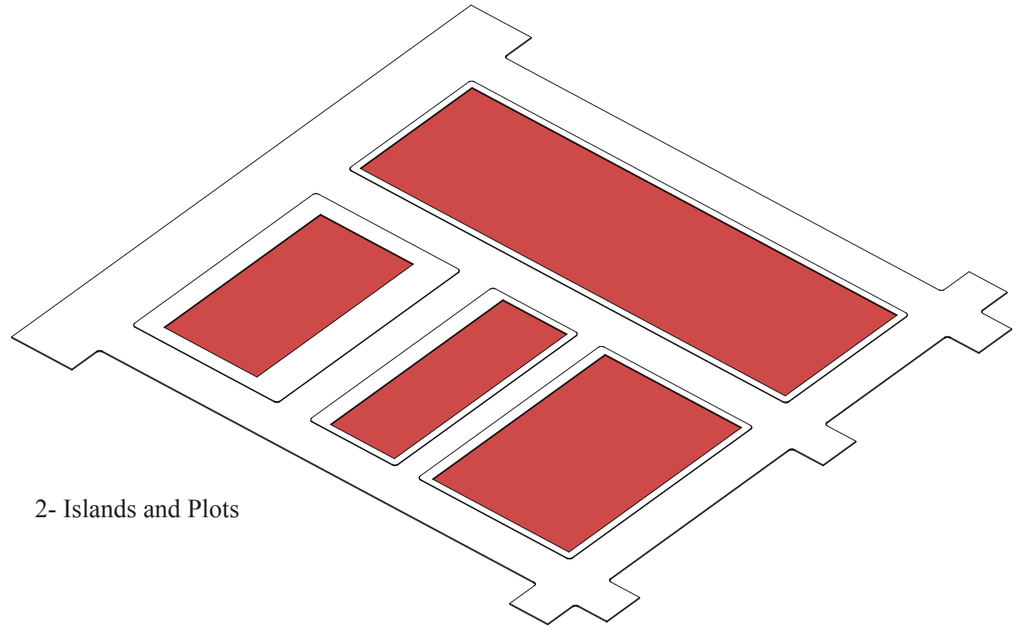
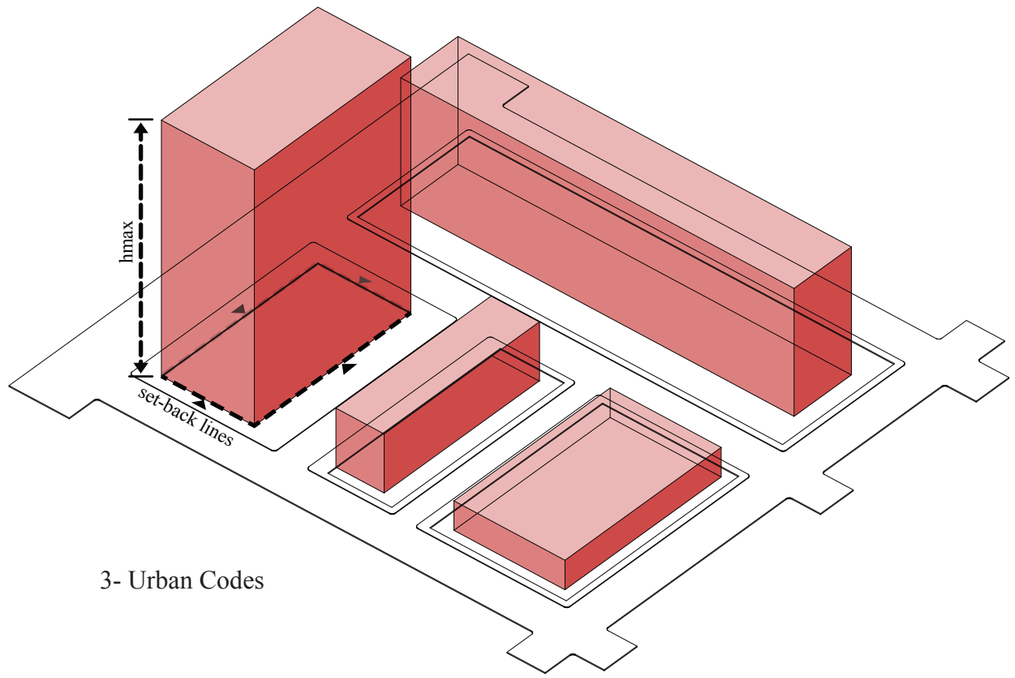
[73] The configurations are obtained using Grasshopper with an algorithm in which elements are randomly populated in a 3D space of whose boundary is defined by a bounding box.



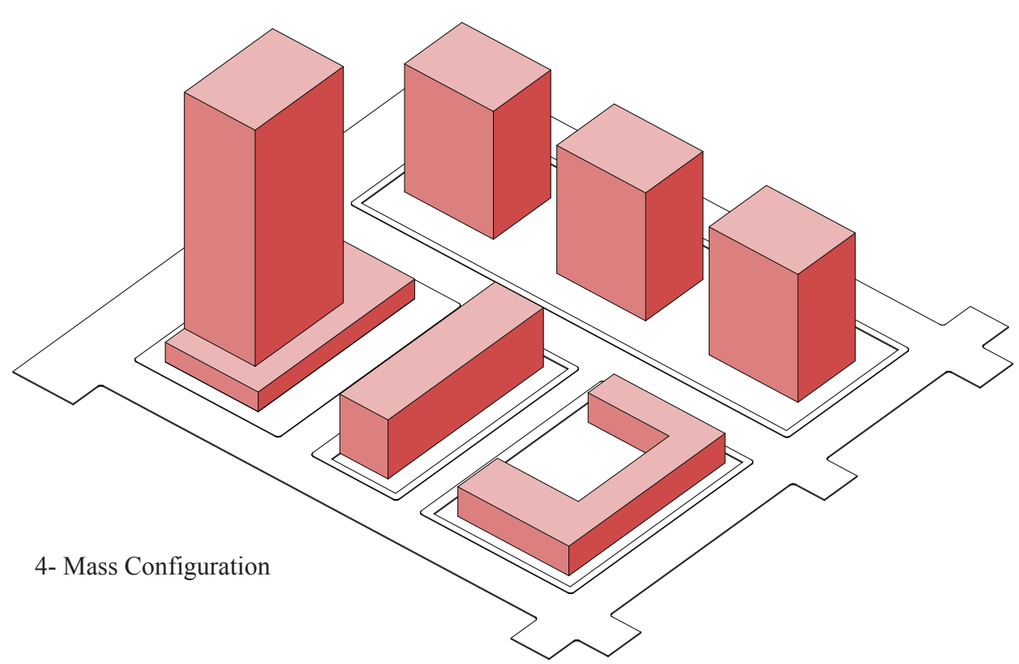
1- Street Pattern



2- Islands and Plots



3- Urban Codes



4- Mass Configuration

Figure 1 Predetermined Actualities Involved in the Creation of the Treeville

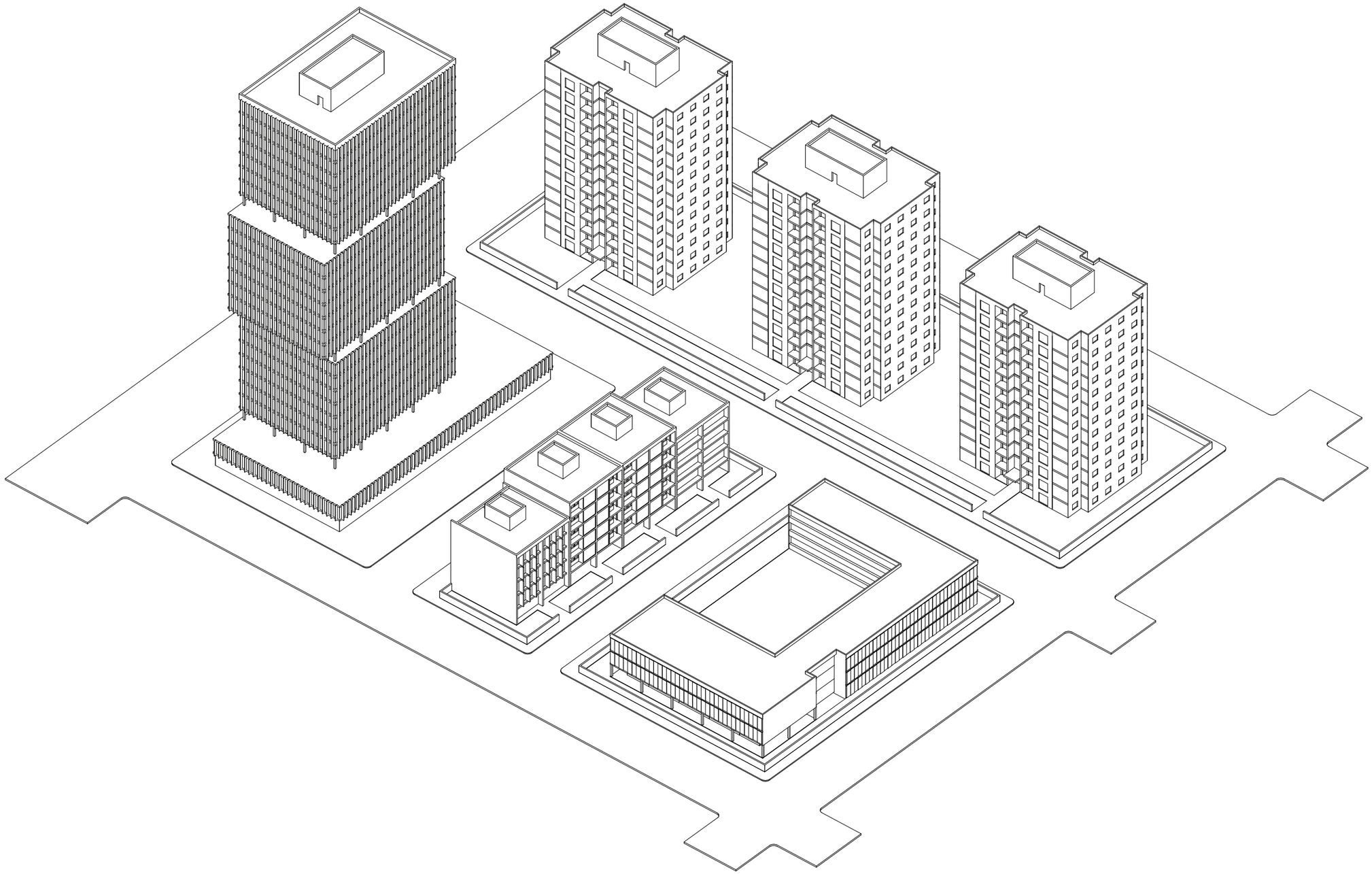


Figure 2 The Treeville

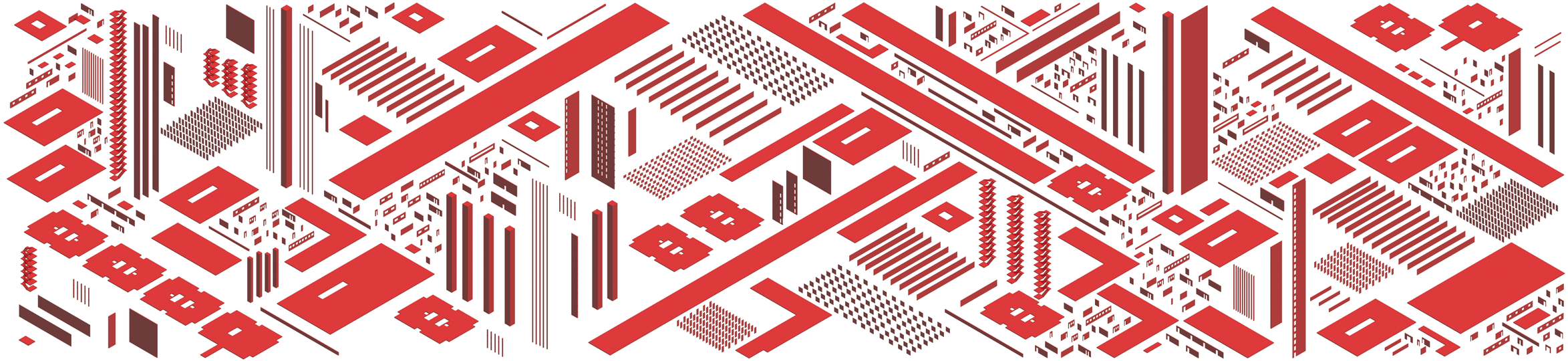


Figure 3 Decomposed Elements of the Treeville

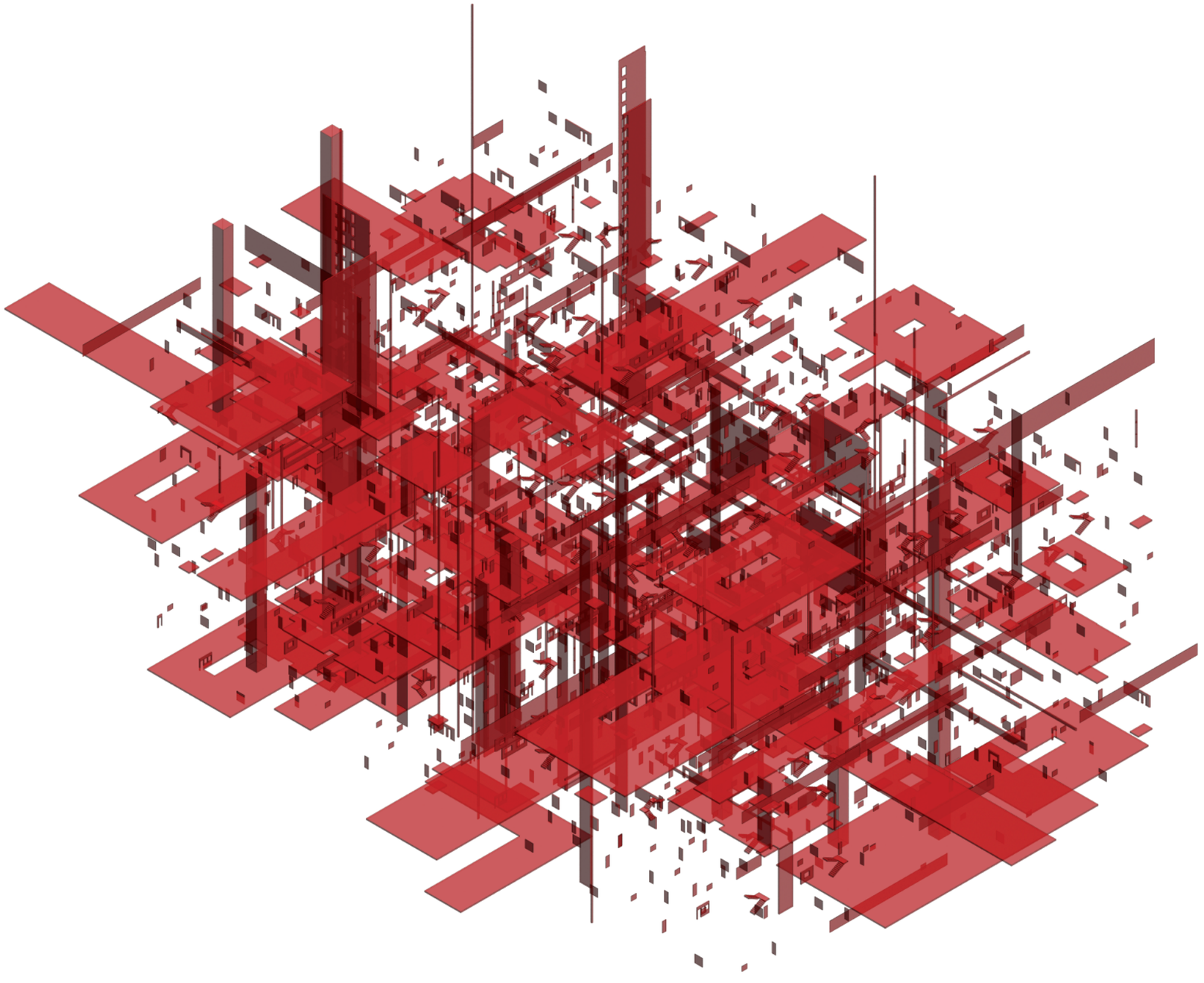


Figure 4 Rhizomeville-Configuration 1

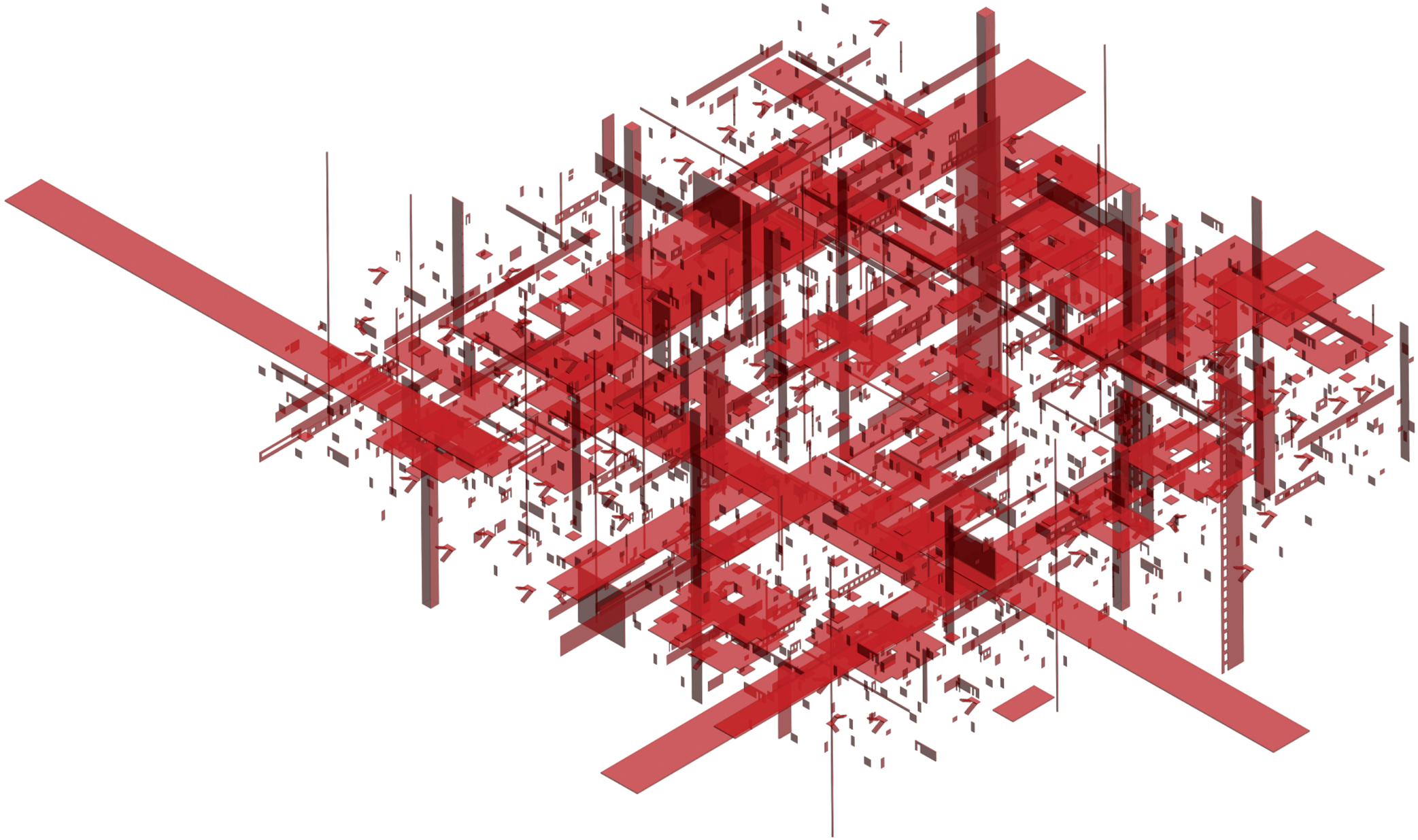


Figure 5 Rhizomeville-Configuration 2

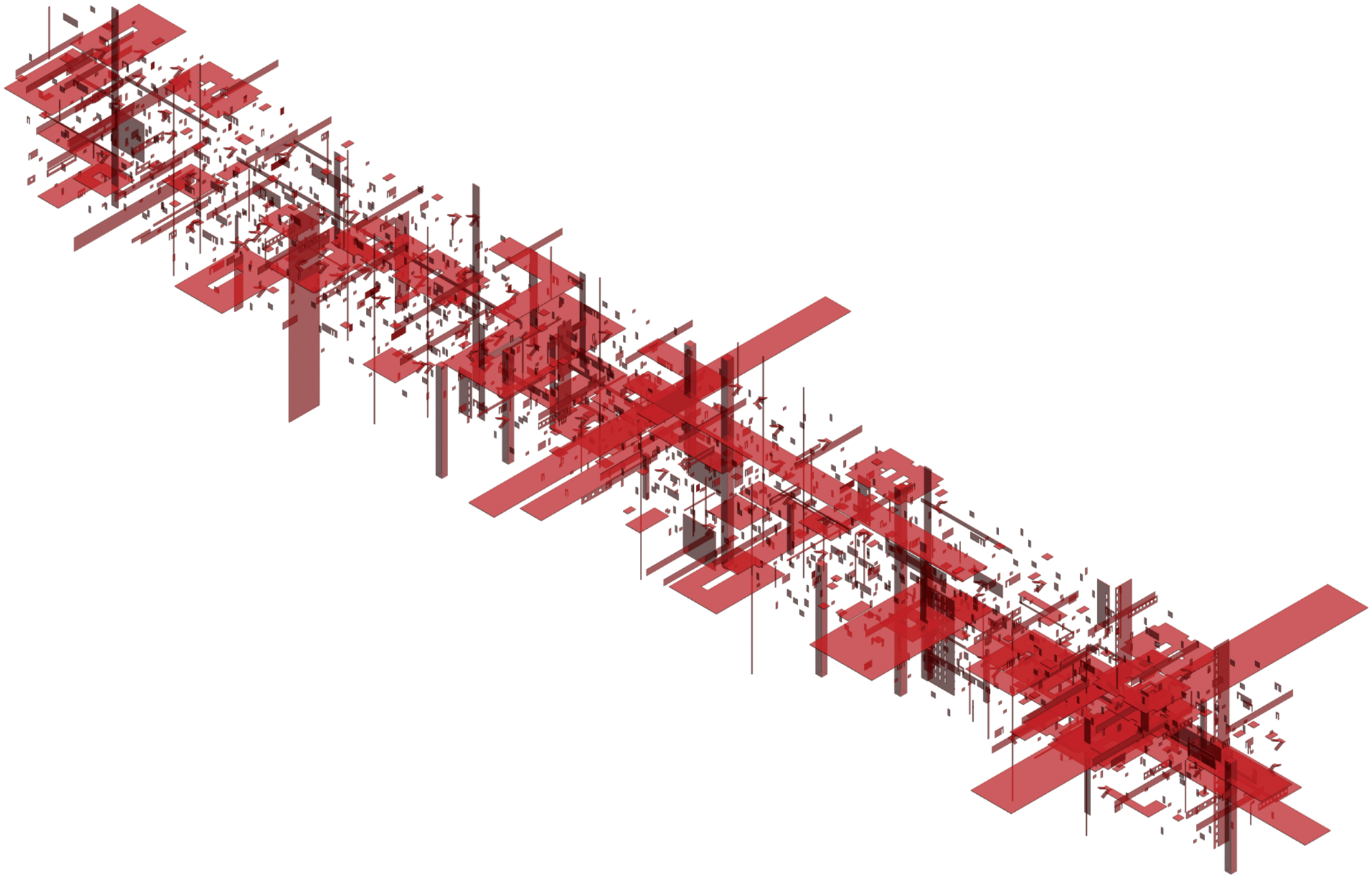


Figure 6 Rhizomeville-Configuration 3

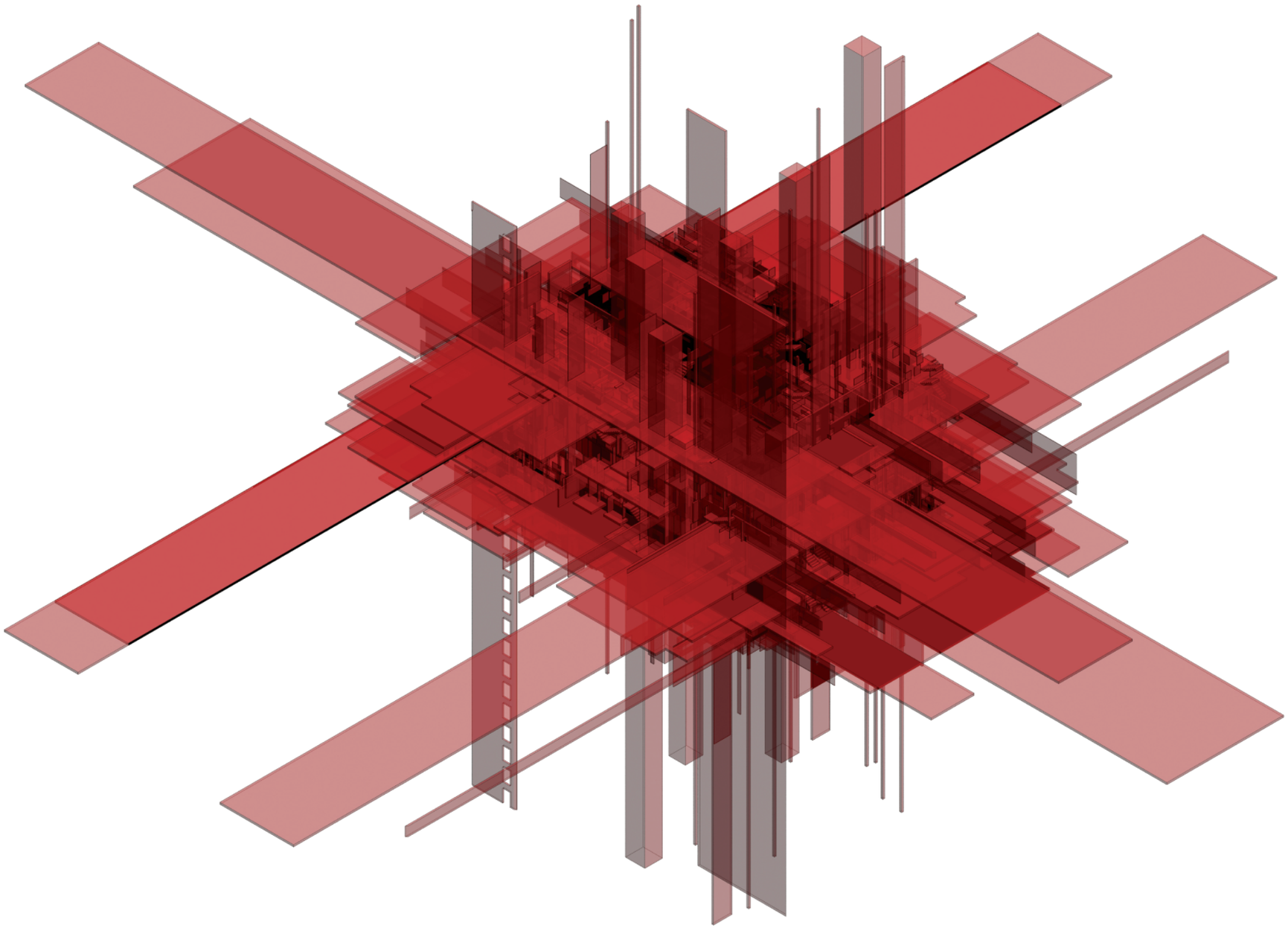


Figure 7 Rhizomeville-Configuration 4

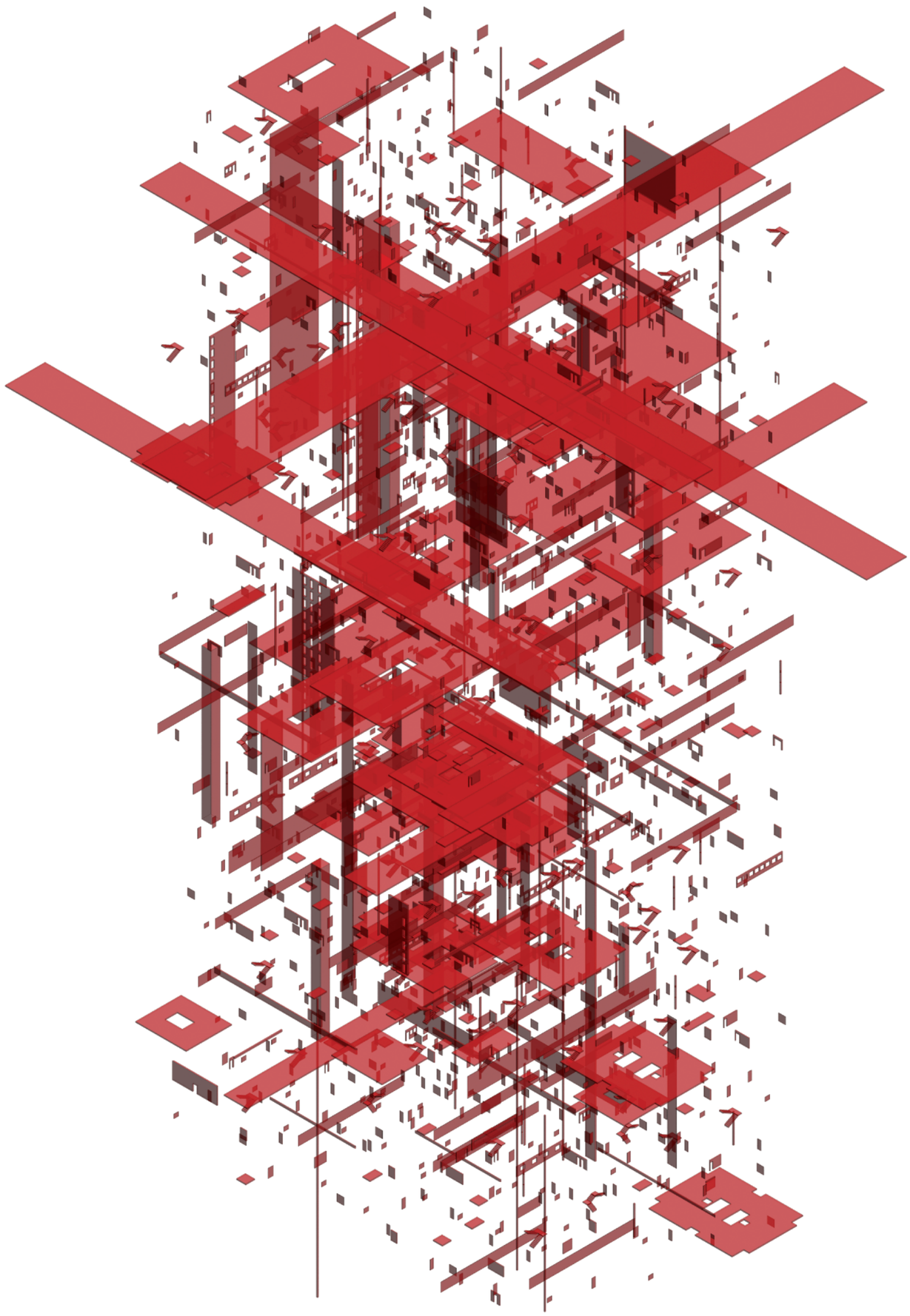


Figure 8 Rhizomeville-Configuration 5

CHAPTER C

CONCLUSION

This thesis has examined the ontology of urban form based on the rationale behind its structural logic. Systems of hierarchy and heterarchy have been discussed with regard to their ability in unearthing the formal capacities of urban environments and it is proposed that tree model based on principles of hierarchy is inadequate for this endeavor and it should be replaced with a rhizomatic model built upon principles of heterarchy. With the help of this paradigm shift, it is assumed that the constraints dictated by trees would be eliminated and the formal spatial potentials of elements of urban environments that we are currently unaware of would be enjoyed.

Based on this assumption, a research on the assemblage theory has been carried out with reference to the works of Deleuze and DeLanda in order to develop a methodology that may be utilized in revealing both the existing urban formal relational patterns and the possible new ones. This ontological inquiry into urban form has been carried out with reference to the concepts of relations of interiority and exteriority to address the conditions that turn cities into structures of hierarchy and prevent them from transforming into systems of heterarchy. Several social, political, cultural and economic mechanisms are considered to be reasons that prevent elements of urban environments to display their emergent capacities. Hence, it is proposed that these should be

eliminated and the focus of interest should be diverted to the formal spatial interplay of the elements constituting the urban form.

Two axioms have been introduced with regard to the insight provided by the concepts of essence and emergence in order to determine the principles of this particular research. In light of this discussion, it is inferred that elements should be ripped off from their attributed essences and the historical processes that prevent them from displaying their emergent capacities should be changed. Owing to the fact that capacities are emergent, permutation strategy is proposed to detect the unanticipated possibilities that cannot be foreseen beforehand. This strategy has been adopted because the search for the capacities requires the exploration of as much configurations as possible to reach a satisfying examination.

Then, in order to illustrate the theoretical framework discussed above, a hypothetical exercise has been carried out where two different simulations of urban environments are formed, namely, the treeville and the rhizomeville. Although the elements that are employed in both of the configurations are the same, the treeville is designed to be an actual replication of existing cities that are produced by the same historical processes elements have been undergoing throughout history; however, the rhizomeville is a virtual conception produced by the permutation strategy to be incorporated in the exploration of the formal capacities of elements of urban environments.

II

What was done in this study is basically a deterritorialization process that is meant to overcome the shortcomings of the high level of territorialization that is materialized through social, political, cultural and economic mechanisms. However, this study is neither the first of its kind nor it is the sole medicine to address all of the problems of urban environments. It is simply a particular way of looking that attempts to problematize the urban condition as a matter of

deterritorialization-reterritorialization process; hence, it is hoped that the open-endedness of the deterritorialization strategy incorporated in this study may result in some other reterritorializations in readers' minds. In this manner, although the discussion on the ontology of urban form with regard to its structural logic has been finalized, there exist some future prospects of this mode of thinking that can also be addressed. Hence, to conclude, we would like to engage into those hoping that they could provide a basis for the further discussions. In other words, they are some speculations on the directions the findings of this study can be utilized and further developed.

III

One of the most significant prospects of this study concerns the actions/ operations that can be conducted after the permutation strategy is utilized. As noted earlier, the permutation strategy is a prequel to design in the sense that it is a procedure that should be carried out in order to explore the capacities of elements before design. And, due to the fact that capacities are emergent, this strategy does not employ any fitness evaluation criteria. In this regard, it can be said that it provides the data of the emergent capacities of the elements of the urban environments in order to be used as an input for upcoming series of operations.

However, although it provides all the data about the emergent capacities, the permutation strategy does not involve any actions on how they can be detected. In this manner, one of the further endeavors of this study could be the detection of these emergent capacities. After these capacities are spotted, some fitness evaluation algorithms can be written in order to utilize those in later stages.

Another important prospect of this study concerns the dichotomy between relations of interiority and relations of exteriority. As mentioned previously, forces acting upon cities are distinguished with regard to their capability in generating relations of interiority or exteriority and various social, political,

cultural and economic mechanisms were ignored for the sake of a new perspective that focuses on the abstract formal relational patterns of elements. This dichotomization is utilized, because the research on formal emergent capacities requires that. Nonetheless, once the emergent capacities are detected by the implementation of the permutation strategy, then, the *raison d'être* of this dichotomy ceases to exist anymore. Hence, reconciliation with all these mechanisms may become another further endeavor for this study. In other words, the results of the abstract interplay of elements may be reevaluated with regard to the input provided by various social, political, cultural and economic mechanisms and the consequences of this reassessment on both sides may be revealed.

BIBLIOGRAPHY

Alexander, C., A City is Not a Tree, *Design*, No: 206, February 1966, originally published in *Architectural Forum* in 1965

Alexander, C., Ishikawa S. and Silverstein M., *A Pattern Language*, Oxford University Press, New York, 1977

Aristotle, *Politics*, Batoche Books, Kitchener, Trans. by Benjamin Jowett, 1999

Ballantyne, A., *Deleuze and Guattari for Architects*, Routledge, London, 2007

Bogue, R., *Deleuze and Guattari*, Routledge, London, 1989

Buchanan, I., and Lambert G., *Deleuze and Space*, Edinburgh University Press, Edinburgh, 2005

Colebrook, C., *Gilles Deleuze*, Routledge, London, 2002

DeLanda, M., *A New Philosophy of Society: Assemblage Theory and Social Complexity*, Continuum, London, 2006

DeLanda, M., *A Thousand Years of Nonlinear History*, Swerve Editions, New York, 2000

DeLanda, M., *Intensive Science & Virtual Philosophy*, Continuum, London, 2002

DeLanda, M., *Philosophy and Simulation: The Emergence of Synthetic Reason*, Continuum, London, 2011

Deleuze, G., *Bergsonism*, Zone Books, New York, Trans. by. Hugh Tomlinson and Barbara Habberjam, 1988, originally published in French in 1966

Deleuze, G., *Difference & Repetition*, Columbia University Press, New York, Trans. by. Paul Patton, 1995, originally published in French in 1968

Deleuze, G., *Two Regimes of Madness*, Ed. by David Lapoujade, Trans. by Ames Hodges and Mike Taormina, Semiotext(e), New York, 2007

Deleuze, G. and Guattari, F., *A Thousand Plateaus: Capitalism and Schizophrenia*, University of Minnesota Press, Minneapolis, Trans. by Brian Massumi, 2004, originally published in French in 1980

Deleuze, G. and Guattari, F., *Anti-Oedipus: Capitalism and Schizophrenia*, University of Minnesota Press, Minneapolis, Trans. by Robert Hurley, Mark Seem, and Helen R. Lane, 1983, originally published in French in 1972

Deleuze, G. and Parnet, C., *Dialogues*, Columbia University Press, New York, Trans. by Hugh Tomlinson and Barbara Haberjam, 1987, originally published in French in 1977

Deleuze, G. and Parnet, C., *Dialogues II*, Columbia University Press, New York, Trans. by Hugh Tomlinson and Barbara Haberjam, 2007, originally published in French in 1977

Felicity, J. C., Rhizome, *The Deleuze Dictionary*, Ed. by Adrian Parr, Edinburgh University Press, Edinburgh, 2010

Grosz, E., Architecture from the Outside: Essays on Virtual and Real Space, The MIT Press, Cambridge, MA, 2001

Hays, M., *Architecture Theory since 196*8, The MIT Press, Cambridge, MA, 1998

Hays, K. M. and Kennedy, A., About Assemblage, *Assemblage,* No.1, The MIT Press, Cambridge, MA, October 1986, Retrieved from: http://www.jsor.org/stable/3171050, Accessed: 22/06/2014

Hegel, G. W. F., *Elements of the Philosophy of Right*, Cambridge University Press, Cambridge, Ed. by Allen W. Wood, Trans. by H. B. Nisbet, 2003

Le Corbusier, *The Athens Charter*, Grossman Publishers, New York, Trans. by Anthony Eardley, 1973

O'Sullivan, S., *Art Encounters Deleuze and Guattari: Thought Beyond Representation*, Palgrave Macmillan, New York, 2006

Phillips, J., *Agencement*/Assemblage*, Theory, Culture &Society*, Vol.23, Sage, New York, 2006

Patton, P., *Deleuzian Concepts: Philosophy, Colonization and Politics*, Stanford University Press, Stanford, 2010

Rajchman, J., *Constructions*, The MIT Press, Cambridge, MA, 1998

Rajchman, J., *The Deleuze Connections*, The MIT Press, Cambridge, MA, 2000

Rowe, C. and Koetter F., *Collage City*, The MIT Press, Cambridge, MA, 1984

Sutton, D. and Martin-Jones, D., Deleuze Reframed, I.B. Tauris, London, 2008

Terzidis, K., Digital Culture and Permutation Architecture, *Rethinking the Human in Technology Driven Architecture*, Ed. by Maria Voyatzaki and Constantin Spiridonidis, paper presented at European Network of Heads of Schools of Architecture & European Association for Architectural Education International Conference: Rethinking the Human in Technology Driven Architecture, Charis Ltd., Thessaloniki, 2012

Tschumi. B., *Architecture and Disjunction,* The MIT Press, Cambridge, MA, 1996

Tschumi, B., Cinégramme Folie: Le Parc De La Vilette, Princeton Architectural Press, Princeton, 1988

Tschumi, B., *The Manhattan Transcripts,* Academy Editions, London, 1994

Wise, J. M., Assemblage, *Gilles Deleuze: Key concepts*, Ed. by Charles J. Stivale, Acumen, Durham, 2005