TOPOLOGICAL GROUND
LAND FORM AND BUILT FORM

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ABSTRACT

TOPOLOGICAL GROUND
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This thesis aims to discover the augmented ground of architecture to respond the emerging landscapes that require different disciplinary studies for re-situating themselves within a contemporary design process. Two significant disciplines that have already been working on this issue stands out: architecture and landscape architecture. By focusing on the "demarcation line" between them and discovering the potentials of that line, the study intends to break the disciplinary borders to construct a new ground for architecture that is responsive to current paradigm shifts where the change on architecture's ground from a single artefact to a system is evident. Lines and landscapes are leading the discussions throughout the thesis. Learning from dualities the two-dimensional bonds and borders are enlarged to four-dimensional systems by topological grounds that are operative, culturally, and naturally thick. Two definitions are put forward to discover these topological grounds: land form and built form. Through a series of assessments, the perpetual change between land form and built form is discovered and discussed.

Keywords: Topology, built form, land form, ground, landscape architecture

ÖZ

TOPOLOJİK ZEMİN
YERİN FORMU VE YAPILI FORM

Aksu, Nesli Naz
Doktora, Mimarlık
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Bu tezin amacı genişletilmiş zeminin modern tasarım sürecinde ortaya çıkan peyzaj düzenlemelerine cevap verebilmesi için kendini yeniden konumlandırması ve farklı disiplinlere ait çalışmalara duyduğu fikri ele almaktır. Bu hususu halihazırda incelemekte olan iki belirgin disiplin vardır: Mimarlık ve peyzaj mimarlığı. İkisi arasındaki "sınır çizgisi"ne odaklanarak ve bu çizginin potansiyelini keşfetmekle çalışma disiplinlerarası sınırları yıkarak, mimarinin tek bir yapıdan bir sisteme dönüştüğü güncel paradigma değişikliklerine cevap verebilen yeni bir zemin inşa etmeyi amaçlamaktadır. Çizgi ve peyzaj tez boyunca ana tartışma konusu olacaktır. İki boyutun bağları ve sınırlarının ikiliğinden edinilen bilgiler, dört boyutlu, tabii olarak kalın, kültürel ve operasyonel topolojik zeminlere uygulanacaktır. Bu topolojik zeminleri anlamak için iki tanım öne sürülecektir: yerin formu ve yapılı form. Bir dizi değerlendirme aracılığıyla yerin formu ve yapılı form arasındaki devamlı değişim ele alınmıştır.

Anahtar Kelimeler: Topoloji, zemin, peyzaj mimarlığı, zemin formu, yapılı form

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INTRODUCTION

Emerging landscapes that are transpired by current ecological and cultural crises, technological developments and shifting paradigms shake architecture's ground. In order to re-situate architecture in these changing grounds, trans/interdisciplinary studies started to become more crucial than before. The relationships between architecture, urban design, landscape architecture, geology and geography stand out more than the disciplines themselves. This study argues that landscape as the augmented architecture will curate the cities and create new grounds.

There are different terms constructing the arguments on the thesis. Topology as one of them, constructs the new ground of architecture as well as the structure of this thesis. It suggests circularity instead of linearity, multiplicity instead of singularity. The connection between every chapter and every term is more important than the chapters themselves. They dissolve into each other chronologically and conceptually. Ground is another term that is discussed both literally and conceptually. Literally it refers to the 'Earth's Ground' with its natural and artificial elements such as water, air, artefacts, earth and green. Conceptually it addresses to the disciplinary grounds by looking at them in academy and practice.

Within the topological structure of this thesis here are two main concepts leading the discussions on the grounds of this study; one of them is line and the other one is

landscape.[1] They are neither compatible nor comparable. They construct the ground for architecture where architecture is not only a part of the ground, but it becomes the ground. This ground is responsive to current changes and discovering the depth of lines and landscapes is architect's field of study. These depths are investigated via roots of disciplines by tracing their history and they are revealing and constructing the roots of topological grounds.

While the dual stance of architecture/landscape architecture[2] and its reflection on academy and practice still exists, this investigation locates itself where they penetrate each other. To avoid any disjunction, the discussions are looking at their co-existence. To this end, with the assistance of a theoretical framework this study constructs its argument by the accumulated knowledge on disciplinary boundaries and produces a series of assessments. These assessments are looking at divergent grounds trying to discover the thicknesses and particularities to be able to design more productive landscapes.

To be able to discuss the augmented field of architecture two arguments on landscapes come forward. First, the interpretation of J. B. Jackson (1909-1996), who was a pioneer in landscape studies in United States, is very critical. He states that landscape always requires a human interaction, brings the discussions to articulated

[1] Base of the research on lines and landscapes was done by the author during the master's studies at Columbia University, Advanced Architectural Design program. Various versions of understanding and representing the landscapes and lines via drawings and photographs was studied within different studios.

[2] The base of this investigation is twofold. First of all, it is derived from being in the threshold of both disciplines by having a dual degree on architecture and landscape architecture and proceeding with combining this dual stance while teaching architectural design studios in various institutions. Second, as a scholar with an ongoing architectural design practice that works within various scales and tries to pursue the research by not differentiating the disciplines.

nature as a piece of architecture.[3] Second dominant figure, Charles Eliot (1859-1897) who was an American landscape architect, influenced the developments on the profession, where he proclaims that landscape architecture should be situated within the school of design instead of horticulture.[4] For him it is an art of design covering agriculture, forestry, gardening, engineering and even architecture itself. Following their definitions this dissertation states that augmented landscape architecture has the potential to curate the cities.

While doing that the thesis starts from the disciplinary dualities by looking at the emergence of landscape architecture and its relationship with/within architecture. These dualities bring up the discussions on the boundaries which is defined with the ideas of Immanuel Kant on "demarcation line"[5]. Even though, demarcation line is seen like differentiating two sides and creating oppositions, Kant argues on the potentials in that line that breaks the oppositions. Two-dimensionality of line needs to go beyond and find the three-dimensionality to discover these potentials. Expanding the two-dimensionality of line to a layered three-dimensional system requires consulting on dualities such as diptych, dialectic, dialogic and hybrid relationships.

Immanuel Kant and his definitions on "demarcation line" is important to discover the potentials of boundaries. He states that there is always something positive in each boundary. To better understand and break the disciplinary boundaries of architecture and landscape architecture, it is important to look at their thresholds and bonds. Following the definitions of Kant on boundaries, lines and dualities, demarcation

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[3] John Brinckerhoff Jackson. 1986. *Discovering the Vernacular Landscape.* Connecticut: Yale University Press.

[4] Charles William Eliot, ed. 1903. *Charles Eliot, Landscape Architect.* Boston: Houghton, Mifflin and Company; the Riverside Press.

[5] Immanuel Kant. 1997. *Prolegomena to Any Future Metaphysics.* Translated by Gary Hatfield. Cambridge: Cambridge University Press: 105.

line refers to the gaps, hinges, bonds between dualities. What is positive in that line corresponds to the moment it breaks the hierarchies and oppositions.

Learning from dualities, this research is referring to the demarcation line that breaks the hierarchies and oppositions, instead while investigating how two things exist/come together it creates continuities and connections. The depths and structure of these continuity and connections brings topological studies to the surface where the fourth dimension of this line is discovered. Topology is suggested both to change disciplinary and material bonds and borders of the architectural ground.

To develop a new ground for architecture it is important to look at the potentials of disciplinary boundaries. They change/evolve over time by producing new disciplines such as urban design, environmental design, landscape design or interior design. Every time its relationship to city and nature is redefined, its focus produces new ways and fields of communication. Looking at the relationships of architecture and landscape architecture, these fields are always in a state of change. When landscape architecture as a discipline emerged and the landscape architecture programs started to take place in architectural departments, their affinity became apparent. While different approaches try to rename this togetherness, per se the question of their theorization became more and more irrelevant.

By looking at different instances around the world, such as recently developed cities in United Arab Emirates to create new communities, new technologies for agricultural lands in Saudi Arabia, new methods of water systems for sinking Netherlands, revealed islands after the melting glaciers in the Arctic, the shift on architecture's ground from a single artefact to a system becomes evident. Acknowledging the shifts of focus and field within various disciplines, landscape architecture is very dominant in architecture both in academy and practice.

This interaction however keeps both disciplines in distance even though they are working together on the same ground. Together with these studies new grounds of architecture are developed around the terms that have various meanings changed over time and used from different perspectives for various purposes. These terms can

be multiplied as, architecturalizing landscape, landscaping architecture, architectonics, land-arch and archiscapes. Instead of looking for new words this thesis proposes to elucidate the meanings of already existing words, where topology comes forward.

Following the discussions of topology[6] within the disciplines of mathematics, literature, art and architecture, the term is used to discover the continuities and connections of the ground. Learning from mathematics, properties of geometric forms that are generated under continuous transformations are the subject matter of this research. Since topology studies the properties of objects independent of their size and form, cultural and historical layers of the ground become essential. In other words, ground's form has a perpetual change due to the natural and artificial interventions, however, this research is looking at the forces that trigger this change.

To better understand these changes within form and cultural and historical layers, examining the relationship between topography and topology is important. Topography mostly represents the two-dimensionality of ground. By considering topology as the extended meaning of topography,[7] this research is looking at the ground's four-dimensional system. This system is represented with thick grounds, where deep research is crucial in order to unveil their visible and invisible features that occur in different time segments.

The best-known way of looking at those thick grounds are horizontal and vertical cuts. To discover the systems of the ground and topologically examine them, two

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[6] The word 'topology' in Ancient Greek refers to the knowledge of place; *topos* (τόπος) means "place, locality" and *-(o)logy* means "study of a branch of knowledge". Webster's Encyclopedic Dictionary defines 'topological' as the properties that do not change in structure and form.

[7] David Leatherbarrow, in his book "Topographical Stories: Studies in Landscape and Architecture" (2004) considers landscape and architecture as topographical arts. He tries to extend the meaning of the term topography to describe the milieu that gives these two disciplines their basic affinity.

terms are introduced in this study, “land form and built form”. Instead of binary oppositions: artificial/natural, under/below, inside/outside divisions, they represent the current visible and invisible conditions of the land. Both of them are essential but not exclusive, they are not static definitions of the current state of land. They change and overlap according to the natural and artificial forces.

To discover these dualities, dialectic comes forward with its features different than the others. Dialectic suggests a linearity and a contradiction between opposing sides. However, on the other hand, hybrid, dialogic and diptych relationships do not suggest any oppositions or hierarchies. Instead of discussing form in relation to space, program, tectonics, and image as autonomous entities, these terms (hybrid, dialogic and diptych) imply their topological co-existence.

This research uses the term ‘form’ in relation to the changing conditions of a place. Land form and built form are the terms to investigate these conditions and emerging landscapes. Natural forces that are subliminal, boundless, and formless create the **land forms**. Land forms are mostly considered as mountains, valleys, plateaus, canyons but they are also the forms that takes shape after the changes on built forms such as the conditions after earthquakes, floods, and wildfires. **Built form** is referring to the forms that take shape with human interaction. It is both a building and a garden. With natural or artificial elements, indoors or outdoors every act planned, designed or measurable constitutes the built form. Some of the built forms that are mentioned in this research are streets, farmlands, squares, buildings, riverbeds, parks, dams, and aqueducts. Both built form and land form are architecture and landscape. Their elements are fluxional, and states are not static.

The change on land form and built form is inevitable. However, their balance on productive landscapes is important for the future of cities. Due to the environmental crisis, interactions of natural and artificial elements have irrevocable consequences. For example, as the cities grow, the melting pace of a glacier is increasing relatively to the rising emission rates and increasing built surfaces. To keep up with these crises and act faster, architecture must be thinking in different scales, time segments and

paces. Instead of focusing on and starting from the details, architecture must see the bigger picture first that covers the field of multiple disciplines. Following these studies, it should focus on leading the discussions by taking the coordinating role on landscapes.

Line in design discourses is used to represent the ground. The coordinating role on landscapes is discovered via line as one of the most important architectural tools to observe and represent the conditions of landscapes and it is leading the discussions throughout the research. Firstly, to discuss the disciplinary bonds it looks at the boundaries, thresholds, and borders as lines. Secondly it is looking at material and conceptual lines within landscapes. These material and conceptual lines are thick and deep referring to the multiple and changing lines of land that are between different states or materials. Considering lines used in the discourse of architecture such as guide line, coast line, time line, section line. Thick line primarily refers to and investigates those conditions acknowledging the fact that they are not frozen and always in a state of change. Even though lines are mostly used to represent the static conditions of a land, by its continuity and multiplication this research use it to discover the dynamic layers.

Fundamentally, the research rises on two distinct pillars Chapter 2 and Chapter 4. Chapter 3, as a hinge, constructs the dialogue between these two. The first track, chapter 2, ‘Lines Within Landscapes’ investigates the background of the bonds and borders of architecture and landscape architecture. It constructs its argument around didactic framework, theoretical framework, and epistemological framework to define its own territory. By looking at the leading discussions on architecture and landscape architecture discourse, the chapter situates itself outside the ongoing studies to open up a new paradigm. Historical developments on disciplinary thresholds of architecture and landscape architecture are examined and conditions where they are penetrating one another and intertwined are investigated.

Second track, chapter 4, ‘Landscapes Within Lines’ traces the material and conceptual lines to work on new grounds of architecture; while uncovering the

current conditions of landscapes, tries to reproduce them. The study on these tracks were evolved at the same time trying to support each other. Different geographies that have topological grounds are rendered vertically and horizontally. The combination of vertical and horizontal cuts is used as a tool to discover unseen conditions of the ground. These conditions are the hints of understanding and projecting on the emerging landscapes and how to be a part of them architecturally.

Chapter 3 'Unfolding the Lines' discusses the material and conceptual lines that are determining the particularities of the 'ground'[8]. To unfold these lines, discover the depths and breadths[9], it is important to understand the dualities. By doing that it provides a new topological ground for the other two chapters. Borders, boundaries, thresholds, and bonds are investigated by looking at different dualities and their reflection on architectural theory throughout years. This investigation supports Chapter 2 and Chapter 4 to establish topological structures for emerging landscapes.

To construct its argument, the first track "Lines Within Landscapes: Between Architecture and Landscape Architecture" renders the relationship of two disciplines from three different perspectives; epistemological framework, theoretical framework, and didactic framework. Within these parts, historical developments on disciplinary thresholds of architecture and landscape architecture are examined by looking at curricular programs, emergence of landscape architecture and discovering the line in between. Conditions where they are penetrating one another and intertwined are investigated which was discussed in the fourth part "Discovering New Grounds". Leaving the ongoing discussions on architecture and landscape architecture behind, this part is looking at the connections of nature, landscape and architecture with its elements and relationships.

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[8] As mentioned before ground is used in two different meanings. Here again it points out both meanings of it.

[9] Aysen Savas in the book "Signifying Traces" discusses the line through Erimtan Museum.

The third chapter that acts as a hinge between the two tracks “Unfolding the Lines: Topological Ground” first discusses the line as an architectural tool and how it is horizontally and vertically articulated to better understand the ground. Antioch, currently known as Antakya -that is the southernmost city in Turkey- and Cappadocia -a historic settlement in Central Anatolia- with their additive and subtractive operational grounds are used as examples for this part which will also later be discussed in some sections of fourth chapter. Then the dualities starting from dialectic relationships to dialogic, hybrid and diptych is explored to extract the necessary parts that break the dualities in architecture.

Antioch and Cappadocia are two settlements with unique characteristics embedded in them. These unique landscapes with significant land form and built form can be multiplied around different geographies. These extremely creative examples require innovative ways of looking and reading the ground to be able to produce proper relationships. This research develops and represents its own methodology to understand and project on the ground. This methodology that acknowledges and investigates the depths of the ground via horizontal and vertical cuts can be transformed and modified according to where it is applied.

Starting from the two-dimensionality of the line to the point that is developed towards four dimensional landscapes are discussed in the last part of the third chapter, “Topological co-existence of land form and built form”. It is the main argument that the thesis suggests for reading and operating on the emerging landscapes. Putting forward the meanings of land form and built form that discovers topological grounds it leads the discussion to the fourth chapter where thick grounds and thick lines are unfolded.

The second track “Landscapes Within Lines: Thick Lines and Thick Grounds” focuses on understanding and projecting on new grounds. Landscapes are physical entities composed by natural, cultural, and artificial layers imposing on each other and generating the ground. Meanwhile, material, and conceptual lines are guiding the visible/invisible layers of it. Material lines are to observe and project on the

landscapes and conceptual lines are to explore the topological nature of the ground. The discussions on them continues throughout the thesis and they are deeply discovered via references, drawings, and constructed images.

Learning from Alexander von Humboldt and his drawings, a personal narrative is developed in the research. It does not propose a methodology but suggest different ways of using text, photographs, and illustrations. These tools are used both to discover and convey the meanings of landscapes around the world via tryptic and polyptych. They are multiplied, fragmented, combined or reproduced to construct an argument on the landscapes.

As mentioned, series of investigations that took place throughout the research is presented in this fourth chapter. This research is looking at these contemporary landscapes as topological grounds that are living, thick, multi-dimensional and operative environments. These investigated grounds have a topological order between land forms and built forms without separating artificial from natural. Grounds that are not represented as a line but observed via lines that constitute a thick surface and blur the boundaries.

In this regard, topology is not only associated with physical conditions of land forms but also in relation to the acts of natural forces to open up a debate on the physical and theoretical conditions of the change within land form and built form. Topological studies in design fields, examples on topological grounds, how they are constituted and developed, are investigated throughout this research. It also seeks out different terminologies and elements of the related disciplines within different cultural geographies. Starting from the roots of architecture and landscape architecture disciplines, by being aware of their subject areas and interdisciplinary relationships, the research proposes a new ground to better situate the argument. These arguments aim to lead the discussions around the emerging landscapes.

This part reproduces the landscapes by trying to reveal their ecological, archaeological, and anthropological layers of different geographies. The investigation continues with multiple images. These images contain photographs,

drawings, writings, and aerial shots. With these multiple images the aim is to show the dynamic relationships that generate the conditions of land form and built form. Potentials of the grounds is discovered by reading different portions of land form and built form to operate on them. After a wide reading of these lines, the study focuses on two distinct cultural geographies and their new grounds by tracing unseen and lost lines.

Geological and geographical data is examined and synthesized to figure the topological ground of architectural space in prominent locations of Antioch and Cappadocia. They are based on research projects that were conducted throughout the evolution of this study. By various drawings it suggests a method of research that is based on the designer's approach and point of view. They are incredible formations with their naturally and culturally layered thick grounds and they are declaring a discussion on the obsolete forms of these layers.

In essence, these examples can be multiplied. As Antioch, many cities in Anatolia share the same horizontally accumulated layers by different civilizations such as Knidos Peninsula, Bodrum, Gobekli Tepe, historical peninsula of Istanbul. Also, as well as Cappadocia, Travertines of Pamukkale, Lake Meke, are examples of vertically rich natural formations that share different characters. Each of these geographies have the potential to be examined in a thesis. The main aim of this research is to reveal their importance in terms of land form and built form while trying to speculate on the topology of their past, present, and future.

As well as these geographies, the research methodologies can be multiplied and transformed. Different ways of reading, understanding, and operating on the ground can be developed where they should learn from the accumulated knowledge in both academy and practice. The proposed methodology in this research respects the depths of the extremely creative grounds and tries to reveal the continuities and connections via applying a three-dimensional grid system. This system overlaps various time segments and via horizontal and vertical cuts reveals and proposes productive architectural programs and spaces.

Briefly, this study puts forward and investigates “Lost Lines and New Grounds”. It suggests a new paradigm for emerging landscapes that is not separating architecture from landscape architecture. Moreover, it is responsive to the climate change, the contemporary technologies and most importantly to the ground itself. Lines, surfaces, and spaces are the research tools. Architectural space is discovered by these tools within the ground and generates operative design methodologies. While doing that it follows a topological approach. Each chapter has a different research topic however their connection and continuity aim to build the argument of emerging landscapes.

CHAPTER 2

LINES WITHIN LANDSCAPES: BETWEEN ARCHITECTURE AND LANDSCAPE ARCHITECTURE

"a surface is the boundary of corporeal space,
and is therefore itself a space,
a line is a space,
which is the boundary of the surface,
a point the boundary of the line,
but yet always a place in space."

Immanuel Kant

What are the emerging landscapes of Anthropocene?[10] How are they formed and what triggers this formation? What is the difference of man-made and natural landscapes? Is there a physical or conceptual line that create limits, boundaries, or thresholds between these formations? How does this line act? Does it create continuities, hierarchies, or oppositions? What is the relationship of these formations with/within the ground? Which disciplines are involved in this emergence? What is

[10] The term "Anthropocene" is proposed by biologist Eugene Stormer and chemist Paul Crutzen in 2000 to state the importance of human in geology and ecology. According to them the role of mankind has changed from a third person passive observer to a central role responsible for the planetary change which brought the need of coining a term for a new geological period.

(http://www.igbp.net/download/18.316f18321323470177580001401/1376383088452/NL41.pdf)

the relationship of these disciplines? Which terms define these relationships? How to proceed with these landscapes?

As the foundation of emerging landscapes, ground change form according to acts and forces that is operated by different disciplines. These so-called landscapes are either formed by natural forces or with human interaction. Considering the human interaction; architecture, landscape architecture and urban planning disciplines are responsible with these formations. In addition, geology and geography are the disciplines that are mostly looking at the natural forces. Today, due to ecological crisis, correlation between those disciplines is more important than ever.

Within them, architecture has the leading potential to bring them together. It curates the landscapes and operates on the ground. This curation is possible by rediscovering the boundaries, breaking the hierarchies and oppositions. The boundaries that have a role in the changing of ground can be determined in practice and theory. Their correlation is very crucial to be able to operate on emerging landscapes and speculate on the past, present, and future of the ground that is the foundation of architecture.

Throughout many years, landscape architects such as Frederick Law Olmsted, Charles Eliot, John Brinckerhoff Jackson, and contemporaries as Garrett Eckbo, David Leatherbarrow, Charles Waldheim, Robin Dripps and James Corner are speculating on those relationships from different perspectives. Architects as Greg Lynn, Bernard Tschumi, Robert Venturi, Anthony Vidler, and Peter Eisenman are asking questions regarding the relationships and continuities within architecture.

Putting the period that they are active aside, each of these architects and landscape architects have an impact on the changings ground of the disciplines. Even though their arguments are different their contribution questions the ongoing debates. These names can be multiplied, however their contribution to academy and practice throughout last decades stand out. To dwell on their approach and enhance the relationships, it is crucial to resituate architecture as the curating discipline of emerging landscapes.

2.1 Epistemological Framework: Demarcation Line

The bonds and borders between theory and practice or between different disciplines require research on associated terms as boundaries, lines, and thresholds. Immanuel Kant (1724-1804) who is a significant figure in modern philosophy states that limits contain mere negations. However, according to him in all bounds there is something positive which he exemplifies as "a surface is the boundary of corporeal space, and is therefore itself a space, a line is a space, which is the boundary of the surface, a point the boundary of the line, but yet always a place in space".[11] This definition, in his critiques[12] published between 1781-1790, is an introduction to understand the different approaches on relationships. It also opens up another debate for the discussion on material and conceptual lines.

Kant's argument on bounds leads the discussions throughout this research. Considering the 'demarcation line' as a thick entity, every line within/between different conditions creates a new space that is to be discovered. While lines look like they are separating two sides, they do connect as well, which changes the existing conditions. The entangled nature of lines and spaces within them are the

[11] Immanuel Kant. *Prolegomena to Any Future Metaphysics*. Ed. Gary Hatfield. Trans. Gary Hatfield. Cambridge: Cambridge University Press, 2004: 105.

[12] Kant's Copernican Revolution reconciles modern science with traditional morality and religion. Critique of Pure Reason (1781-1787), the Critique of Practical Reason (1788), and the Critique of the Power of Judgment (1790). According to him, human understanding is the source of the general laws of nature that structure all of our experiences, and human reason is the foundation for the belief in God, freedom, and immortality. Therefore, since they all rest on the same foundation of human autonomy, scientific knowledge, morality, and religious belief are mutually consistent and secure. It is also the end of nature according to the teleological worldview of reflecting judgment which Kant introduces to unify the theoretical and practical parts of his philosophical system. (Michael Rohlf. 2020. *Stanford Encyclopedia of Philosophy*. Edited by Edward N. Zalta. Vers. Fall 2020 Edition. https://plato.stanford.edu/entries/kant/.)

main problematic of the research that is both metaphorically and directly looking at disciplinary bounds and physical bounds.

As one of the leading concepts that directs the discussions throughout the research, line is approached from two perspectives. They are material and conceptual lines. Considering the definitions of Immanuel Kant on “demarcation line”, where he states that there is always something positive in each bound, it is important to find the positive within material and conceptual lines. In this case following his definitions, how two things exist/come together via these lines are investigated. Each line refers to the gaps, hinges, bonds between dualities and what is positive in them when the lines break the hierarchies and oppositions.

Firstly, discovering the lines and spaces between disciplines will help to set up a new ground for architecture that will fulfill the current needs of trans/multidisciplinary approaches. In this regard the disciplinary threshold between architecture and landscape architecture comes forward and it brings up many questions on their relationship. To better understand and expand their relationship it is important to look at them both in academy and practice. The theorization of architecture and landscape architecture in relation to one another change positions according to different approaches. While considering these different approaches, theories, and potential relationships; expanded field of architecture where they co-exist becomes crucial.

Material and conceptual lines that define the disciplinary and physical bounds represent this co-existence. It suggests, continuity that unifies instead of separating one from another. Discovering the definition of these lines and theories on them helps the recognition of thresholds and how to approach them.

2.1.1 Material and Conceptual Lines

Italian architect, Marco Frascari (1945-2013), in his article “Line as Architectural Thinking” states that architectural lines are material, spatial, cultural and temporal

occurrences of refined multi-sensorial and emotional understandings of architecture.[13] His discussions about Leon Battista Alberti's understanding of denoting lines (lineamenta) derives from the use of tracing lines which are associated with the artifact not necessarily as a part of it but also as a guide for it.[14] This brings the knowledge of the line to the research; it generates a constant change within ground where there is no such physical or theoretical line in between. Instead, there are an accumulation of denoting lines that are acting as a guide, representational or operational tool.

> *The protracted translation of lines of drawings into building lines and vice versa is the most essential phase of the architectural process of imagination by which buildings are conceived and erected, since the ontogenesis of architectural lines assimilates itself the primary processes of designation that take place on construction sites. Lines are tense enigmas slowly translated on paper and their solution determines architects' ability to consider and savour the facture of the building.*[15]

Line is considered as one of the most important architectural tools to observe and represent the conditions of landscapes. As well as the translations of building lines and lines of drawings that Frascari mentions, the knowledge of ground and how it is translated to drawings is an important topic. This translation is not only two ways but also acts in three ways between reading the ground and producing operational drawings to reveal the unseen conditions, constituting the drawings of what we see and its reflection on reality.

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[13] Marco Frascari. 2009. "Lines as Architectural Thinking." *Architectural Theory Review* (Routledge) 14 (3): 200.

[14] Ibid. 208.

[15] Ibid. 201.

Lines of ground can be seen as bounds of under/belowground, inside/outside, artificial/natural, however, each of these bounds represent new conditions. To use them as an operational tool, they require a broader meaning which should be referred as “thick lines”. They collect moments from the past, present, and future to reveal what is unseen. Thick lines refer to the multiple and changing lines of land that are between different states or materials. Considering lines used in the discourse of architecture such as guide line, coast line, section line and time line, ‘thick line’ primarily refers and investigates those conditions acknowledging the fact that they are not frozen and always in a state of change. Throughout the research ‘thick lines’ as material and conceptual lines are further discovered with different illustration and texts that tries to understand and represent new operational grounds.

2.1.2 Working on the Line between Architecture and Landscape Architecture

Looking at the conditions where architecture and landscape architecture co-exist let us look at their roots and discover the particularities of their common ground. To do that initially, it is critical to understand their disciplinary bonds and borders in terms of historical developments where significant theories on their coexistence are constructed.

Charles Eliot, J.B. Jackson, Frederick Law Olmsted are the first landscape architects who had been discussing the relationship of architecture and landscape architecture in United States stating that to convey the broader meaning of architecture, it requires the word landscape. After the contributions of Charles Eliot and his colleagues in the beginning of 20th century, contemporaries as Garrett Eckbo, David Leatherbarrow, Charles Waldheim and others have studies working on the relationship of landscape architecture with different disciplines, especially architecture. According to different approaches, the theorization of architecture and landscape architecture swap positions. While they are being a part of each other they also constitute the foundational theories of another.

David Leatherbarrow, professor of architecture and chair of the graduate group in architecture at the University of Pennsylvania School of Design, Philadelphia, in his book "Topographical Stories" published in 2004, questions the common premises of architecture and landscape architecture. He states that according to the "traditional understanding" these two disciplines are seen fundamentally different from each other and until recently landscape was seen as the offspring of architecture. He argues that both disciplines form a singular cultural framework which is "topography", and it is the only topic that they have in common. He tries to extend the meaning of the term topography to describe the milieu that gives these two disciplines their basic affinity. While both disciplines are associated with topography, their intimacy changes. Topography is mostly showing what is visible on the terrain. Maps that are representing the topography are abstract drawings showing slopes and elevations, roads and parcel rules via lines and points.

While Leatherbarrow discuss the relationship of architecture and landscape architecture he states that construction of buildings and actual making of landscapes are both ancient. According to him the difference is that landscape architecture lacks a long history of self-named practitioners while individuals identified themselves as architects in the remote past. However, the theory and practice of architecture and landscapes were always as important in the history, the main difference is landscapes were discussed by the fields of agriculture, art theory, architecture, or aesthetics.[16] Architects has always discussed other fields within architecture. On the other hand, in relation to architecture, landscapes were mostly a subset of them due to their subject areas, which started to change at the end of nineteenth century.

[16] David Leatherbarrow. 2004. *Topographical Stories: Studies in Landscape and Architecture.* Philadelphia: University of Pennsylvania Press: 10.

Starting from the meaning of the word 'landscape' itself, John Brinckerhoff Jackson also known as J. B. Jackson[17], in his book "Discovering the Vernacular Landscape" published in 1984 questions the relationship of the discipline landscape architecture with the disciplines that interact with it. Considering the period that landscape architecture has emerged, he first discusses the use of the word landscape by painters and gardeners. Significantly, he suggests that the use of landscape always contains a **human interaction**. Regardless from the impact, this interaction is defined in both aspects of a user and a designer.

The discussion covers many approaches and changes that span from the argument of "landscape as a composition of manmade spaces on the land" to the persistent definition of landscape: "A portion of the earth's surface that can be comprehended at a glance."[18] The importance of his definition is that landscapes are more than geographical and geological fragments. They introduce a system that instead of fragmenting, brings together to operate within natural and artificial elements. Some examples for those systems can be given as infrastructure, roots of plants, rivers, and green corridors.

The "composition of manmade spaces" resembles the use of both artificial and natural elements. Geography and geology are looking at the horizontal and vertical layers of the ground however their integration is important to discover. This discovery reflects on the understanding of elements that constitute the landscape. Their history reflects on their future, current conditions interact with each other. Reflections and interactions are the references for operational grounds that constitute the landscape.

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[17] J. B. Jackson is a significant figure speculating on American Landscape, his studies contributed to the cultural landscape studies of America.

[18] John Brinckerhoff Jackson. 1986. *Discovering the Vernacular Landscape.* Connecticut: Yale University Press.

Gareth Doherty, who is Associate Professor of Landscape Architecture and Director of the Master in Landscape Architecture Program at the Harvard University Graduate School of Design, and Charles Waldheim, who is the John E. Irving Professor of Landscape Architecture and Director of the Office for Urbanization at the same university, are one of the most important scholars who contributed to the theories on landscape architecture. The book, "Is Landscape…? Essays on the Identity of Landscape" pursues the scope of different definitions of landscape to both "disturb and develop" the received understanding of landscape architecture.

Garrett Eckbo (1910-2000), who was an interdisciplinary scholar he was always trying to study and teach within the threshold of landscape architecture and architecture departments at the Harvard University Graduate School of Design, contributed to the book with his article 'Is Landscape *Architecture*'. The article states that the togetherness of people and nature define the relationship of landscape and buildings where he mentions the challenge is to generate new forms between people and nature that will reflect in architecture and landscape.[19] His books and projects discussing how forms produced by human and natural forms should blend into each other instead of segregation has been very important on the theory of both disciplines.

> *Landscape architecture must do what its name implies - it must integrate landscape and architecture. True landscape architecture produces systems of relations in which neither "landscape" nor "architecture" loses its integrity, disappears, or becomes mere decoration for the other. All of this, of course, is subject to definition, and these vary with the source.*[20]

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[19] Garrett Eckbo. 1983. "Is Landscape Architecture?" *Landscape Architecture Magazine* (American Society of Landscape Architects) 73 (3): 64-65.

[20] Ibid.

Clemens Steenbergen and Wouter Reh, who are both significant landscape architects teaching at TU Delft, developed different research areas in landscape architecture at the school. They published books on the relationship of architecture and landscape architecture. As one of the most distinguished books reflecting their studies, 'Celebrating 10 Years of Landscape Architecture Education, Section of Landscape Architecture Faculty of Architecture and the Built Environment Delft University of Technology' elaborates the educational developments in TU Delft and highlights landscape architects who played a part in. The book is structured in three different sections profile, work, and people. The disciplines existence, transformation in relation to urban and architectural issues are discussed through projects.

As the first theme on this relationship, Steenbergen and Reh with a team of research and teaching staff, define a method of investigation that breaks down the formal characteristic of a landscape composition into four layers:

> *the rationalized and activated topography (basic form); the architectural elaboration of three-dimensional landscape space (spatial form); the metaphorical images referring to the natural, cultural, and urban landscape (image form); and the use and experience of the landscape (programme form).*[21]

The layers that they put forward was discovered after defining the operative grounds as land form and built form in this study. Acknowledging basic form, spatial form, image form and programme form informs the potential characters of ground. Land form and built form is considering the ground in terms of all these 4 layers of

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[21] Inge Bobbink, et al. 2022. *LA.X Celebrating 10 Years of Landscape Architecture Education.* Delft: Section of Landscape Architecture Faculty of Architecture and the Built Environment Delft University of Technology: 10.

definitions however it is contradictory since the idea of this research is not to differentiate basic form from spatial form or image form from programme form. According to this research their togetherness represents land form and built form.

Their research was followed with a theme on metropolitan landscapes that enlarges the scale and discusses the transition from a city/landscape division to a more dynamic metropolitan landscape "as a carpet of urban and landscape fragments".[22] Urban landscapes, formed with horizontal and vertical layers, are important for understanding and developing a method on cities that are curated by landscapes.

Furthermore, in their book "Landscape and Architecture: The Design Experiment of the Great European Gardens and Landscapes" investigate the European Gardens in relation to their landscapes. While looking at **landscape architectonic**, they put forward architecture and landscape as two distinct topics with relational historic changes. According to them, the model of the villa (Figure 2.1 and Figure 2.2) represents an infinite reservoir of landscape architectonic concepts for anchoring these qualities in the contemporary landscape. It contains the design keys for dealing with different landscapes and placing them distinctly over against the new urban topology, through this time and place can again receive an original meaning.[23]

[22] Ibid. 10.

[23] Clemens Steenbergen, and Wouter Reh. 2003. *Architecture and Landscape The Design Experiment of the Great European Gardens and Landscapes*. birkhäuser publishers. 389.

Figure 2.1 The Boboli Gardens, Villa Medici, Villa Cetinale. (Steenbergen and Reh. 2003, p.52, p.44, p.68)

Figure 2.2 Villa D'este, Villa Gamberaia, Villa Giulia. (Steenbergen and Reh. 2003, p.92, p.60, p.84)

From the painters to the urbanists, landscapes are both a tool to represent the view and construct ideas on. Charles Waldheim, in his book “Landscape Urbanism Reader” states that landscape has become a lens through which the contemporary city is represented and a medium through which it is constructed. Landscapes are both the foundation of cities and their current form. The topologic quality of this perpetual change is suggested as the forthcoming extended field of architecture in this research.

Apart from the meaning and the use of landscape as a word, landscape architecture is seen as the discipline that deals with tectonics of land. English landscape architect, garden designer and garden historian, Tom Turner, claims that landscapes are real places that are perceived and seen, dependent on physical and mental points of view. Foregrounds and backgrounds switch depending on position[24]. In his book "City as Landscape" published in 1996, he states that planners, designers, artists, architects can learn from each other, but public suffers from over-fragmentation and over-specialization. A wholistic approach is required to better understand and operate on grounds both for the public and architects. This research proposes regardless of who transforms the land under investigation, architects have the potential to curate these relations and landscapes are an emerging tool for this both for the public and designers.

As these studies accumulate, bonds and borders of architecture and landscape architecture according to the changing relationships of cities, landscapes and nature are institutionalized under different theories. These theories can be multiplied as environmental architecture, landscape urbanism, landscape morphology, green urbanism, ecological urbanism, etc. Initially, it is critical to understand their disciplinary bonds and borders in terms of historical developments. While looking at these developments it is important to mark the moments that studies their co-existence.

[24] Tom Turner. 1996. *City as Landscape: A Post-Post Modern View of Design and Planning*. London: Taylor & Francis.

2.2 Theoretical Framework: Emergence of Landscape Architecture

To define the relationship between architecture and landscape architecture, it is crucial to look at the emergence of landscape architecture in the United States[25] at the end of nineteenth century, since it was where the first landscape architecture program was established. This examination requires research on landscape architecture and its associations in terms of its relation to nature, then its relation to architecture whether produced as a single object or as a city.[26]

Considering the discipline, in the United States, where the American Society of Landscape Architects was founded in 1899, landscape architecture began to gradually replace landscape gardening in the late 19th century. In 1893 the first landscape architecture course was offered in Harvard University. In 1900 the world's first landscape architecture program was established by Frederick Law Olmsted again at the same university. His partner Charles Eliot[27], who died in 1897, states in his writings that landscape architecture belongs to the school of design instead of horticulture and it is an art of design covering agriculture, forestry, gardening, engineering and even architecture itself. In the late nineteenth century, when landscape and architecture began to converge, Eliot goes on to say that the word "landscape" is needed to convey the broad meaning that "architecture" entails.[28]

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[25] Garrett Eckbo in his article "Landscape Architecture" discusses the evolution of the discipline. He states that the public park designs within the cities started in United States with Frederick Law Olmsted.

[26] This is an important topic of research that should be extended to look at gardens and urban spaces of Persian, Spanish, Japanese geographies.

[27] Charles Eliot studied at Harvard University where he took courses on horticulture, botany, geology, ... Later he worked with Frederick Law Olmsted in many landscape architecture projects in Boston including The Emerald Necklace, also he directed early development of the Boston Metropolitan Park System.

[28] Charles William Eliot, ed. 1903. *Charles Eliot, Landscape Architect.* Boston: Houghton, Mifflin and Company; the Riverside Press: 630.

On the other hand, looking at Europe, before the emergence of landscape architecture, landscape gardening of royal palaces was very significant in terms of their size and their use. Until in seventeenth century France and later in eighteenth century England, gardens of kings' families as a park were an essential part of the royal palaces and royal life. These gardens were later opened to the public and gradually changed to an unbound space and became a part of the city. Examples of these gardens can be given as, King's Garden in Copenhagen, it was temporarily opened to the public in 1771 and permanently in 1819. Kew Gardens in London was opened to the public in 1840 and Kensington Gardens in 1841.

Figure 2.3 Palace of Versailles. (Aerial image retrieved from Google Earth)

English landscape architect Tom Turner, gives Louis XIV's park in Versailles (Figure 2.3) as an example that became unbounded when he projected the avenues outwards and opened the park to the public, crossing over the fences showed that all

nature was his garden.[29] Following this, the nineteenth century 'public parks' emerged, which again had a different kind of boundary. This change of boundaries for landscape brings the problems of dealing with not only the single building, but also the city with its infrastructure and different users. This provides the base for architecture and landscape architecture to become closer. This closeness initiates the interdisciplinary studies in terms of practice as well as academic research.

The worldwide evolution of landscape architecture[30] requires deep research in different geographies from the Middle East to Europe and America. Its interaction with city and rural as garden design, preserving natural landscapes or proposing agricultural lands has various effects on the evolution of the discipline. However, in this research, the focus is more on urban landscapes where natural and artificial elements co-exist and according to the culture and nature of the cities. The aim is to enhance this co-existence.

Theories on urban scales are institutionalized employing various terms such as landscape urbanism, urban morphology, landscape morphology, urban design, and urban landscape. These terms are cultivated within the discussions on architecture and landscape architecture where landscape architecture for many years has also changed its name from, landscape gardener, garden designer, garden architect and landscape designer depending on where it had been discussed and constituted.

According to the Oxford Dictionary, the word landscape dates to 17th century and defined as a natural scenery on a painting. It is originated from the Dutch word

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[29] Tom Turner. 1996. *City as Landscape: A Post-Post Modern View of Design and Planning*. London: Taylor & Francis: 179.

[30] While looking at the evolution, garden design around the world becomes crucial. Spanish gardens, Japanese gardens, Persian gardens are an important research topic for the roots of landscape architecture, however they are a topic for another research with their wide and deep background. This research mentions the garden design when it augments the productivity of cities.

landscap and its rough equivalent in French is *paysage*. The roots and meanings of the word landscape change according to different cultures which reflect the continuity of changing approaches on landscapes.

Landscape comes from Dutch *landschap* "landscape," in art, a secondary sense from Middle Dutch *landscap* "region," mentions the condition of a land; land "land" + -scap "-ship, condition". This research is looking at the conditions of land in relation to not only their current conditions but also considering their connectivity and connections of past, present, and future conditions. In Figure 2.4 there are photographs of ecological healings of WWII bomb scars in Germany which shows different conditions.

Figure 2.4 Henning Rogge's photographs of the ecological healing of WWII bomb scars. (source: https://hyperallergic.com/137324/photographs-of-the-ecological-healing-of-wwii-bomb-scars/)

The French word for landscape *paysage*, stands for countryside (*pays* country). Its roots are from the Latin word *pagus* which Jean-Francois Lyotard mentions as "*pagus* was used to refer to the frontier region on the edge of towns and it refers to regions of countries which whilst they are not necessarily uncultivated, are not exactly where you would go for stroll."[31]

[31] Lyotard, Jean-François. 1989. *The Lyotard Reader.* Oxford, UK; Cambridge, Mass., USA: Blackwell: 13-14.

The different meanings of the word landscape, make it very important for cities and communities beyond recreation purposes. Landscapes function to create productive -not only agriculturally but also culturally- cities, a groundbreaking change from scenery of a painting. In addition to these shifts, the memory of the land, what it carries throughout centuries in natural and cultural terms, is a part of the broad meaning and understanding of landscapes.

An associate professor of landscape architecture at the Harvard Graduate School of Design Sonja Dümpelmann in her article "What's in a Word: On The Politics of Language in Landscape Architecture", states that by looking at the nomenclature, the profession in Germany shows it clearly that the word choice and the name of the profession has always been political.[32] She states that a garden can cover an entire territory or a smaller area, as well as a landscape, and can also be considered at any scale. She also mentions that, even though the subjects related to landscapes and gardens share the same content, the difference comes from the idea that in the United States the 'landscape architect' was dealing with a spacious land that was not shaped by man before. However, in Europe 'garden architects' were dealing with the land that was already been shaped by man for millennia.

Dümpelmann's article states that, in the United States the discussion was dominated by the visual perception and painterly interpretation of landscape, they were approached as the contrasting yet integrated elements of the cities. On the other hand, in Germany the discussion up until WWII were dominated either by stylistic concerns (the nature garden vs the 'architectonic' garden) or concerned by the merging of **productive -**as orchards and sports facilities- and visually appealing landscapes. After WWII the discipline gained a significant importance to heal the

[32] Sonja Dümpelmann. 2014. "What's in a word: on the politics of language in landscape architecture." *Studies in the History of Gardens & Designed Landscapes* (Routledge) 34 (3): 223.

cities in Germany, natural features started to be a part of city centers and residential and agricultural areas were to flow into each other.

Leberecht Migge (1881-1935), who was a German landscape architect, believed that it was possible to solve economic and political problems with parks and gardens in cities. He stated that those landscapes could become a nationwide or international program, which can operate cross political borders.[33] He believed that productive lands are not only a research and design topic for rural areas but can also be a part of the cities where they would create self-sufficient societies.

An important obstacle for these self-sufficient societies is the political borders that break the continuity of land with rules that are not respecting the nature. Political borders are lines that are dividing land into two different parts conceptually and sometimes physically. This division prevents physical flows of transportation and interaction as well as holds different government policies. However, natural flows and forces are connected and continuous within those borders. In terms of landscapes, they have a four-dimensional system that operates cross borders. The most striking examples can be given as: Amazon Rainforests as the world's largest tropical rainforest covering lands in South American Countries such as Brazil, Columbia, Peru, Bolivia, Ecuador, Suriname, Venezuela and even French Guiana that is an oversees region of France. Patagonia, as the region compassing deserts, fjords, lakes, glaciers is governed by Argentina and Chile.

[33] Ibid, 222.

Figure 2.5 borders of countries, Amazon River and Amazon Rainforests. Produced by the author.

The division by border lines exist in every geography in different scales. This constructed line within geographies and geologies as well as between artificial and natural elements is arbitrary and disruptive for landscape architecture and architecture. Their co-existence unfolds these lines and inhabits them. The forms, territories and programs created within them enhances the social relations, increase productivity of societies. Figure 2.5 shows South America; red lines are the political borders. However, Amazon Forests crosses these borders, Amazon River in some cases while crossing the border sometimes it defines the border where these political borders are following the river.

A parallel investigation is conducted by Sinan Cem Kizil at METU where he states that the defined boundaries cannot be reduced only to the rules of geography or political conditions. Power, resources, finance, meteorology, astronomy and many more topics drives the debates on territorial conflict within the borders. There are

cases that this complexity of borders becomes buffer zones that thickens the borderline with bridges, towers, rivers, barracks and even villages.

2.3 Didactic Framework: Current Curricular Programs

To understand the roots of architecture and landscape architecture it is crucial to look at the academic programs established in different cultural geographies. According to their locations and backgrounds each landscape architecture program has its own statement and generates different initial theories. As it was mentioned before, natural, political, and social circumstances trigger this variation. Landscape architecture[34] has slowly become an important topic for architectural programs that are following current debates and leading the discussions. To conduct research on these topics, selected universities and programs can be multiplied according to their tendencies in every continent. However, in this part, regardless from the quantity of examples, examinations on the well-known[35] and first programs are chosen that also have distinct locations with the relationship of nature, city and architecture that acts as a research field.

[34] Istanbul Technical University constitutes the base of this research where architecture and landscape architecture programs are working together under the Faculty of Architecture. However, while the first year of the curriculum is the same for both programs they evolve separately and lose their contact within the following years. This observation belongs to the author by completing the dual degree program of architecture and landscape architecture at Istanbul Technical University within the years 2008-2014. Meanwhile the base of the research started with this observation, Istanbul Technical University was not involved in the selected programs.

[35] Since the main argument of this study is not only discovering the academic programs but is to constitute the expanded field of architecture as the new ground for architecture in academy and practice, institutions are selected according to the knowledge and experiences of the author. These chosen examples are observed by either being a part of these institutions while studying and teaching there or by being aware of their syllabus, academic staff, and publications.

Initially, three outstanding landscape architecture programs are selected that have a crucial impact and lead the discussions around the world. The first three institutions are Harvard University, ETH Zurich and TU Delft. These institutions have a statement both with their groundbreaking curriculum and within the geographies they are located. Each of them has their own cultural landscapes in education. Their connection to the geographies that they are a part of constitutes the research environments for their curriculum and social life.

In addition, two architecture programs that are dealing with the expanded field of architecture in relation to landscape architecture are selected. These institutions are Columbia University in the City of New York and Middle East Technical University in Ankara are first hand experiences. Even their names have a strong statement in relation to where they are located. On the other hand, these two campuses have opposite relations to the city, one creates an atmosphere supported by New York City. The other one constructs a natural environment within the city and detaches itself from it. These selected architecture programs that are looking at the emerging landscapes and atmospheres, are rendered by considering their physical environments. Their structure is mostly based on interdisciplinary studies and tries to speculate on the accepted boundaries/study fields of architecture.

At this stage, universities from the US and Europe had priority to trace the roots of the disciplines, track the current conditions and project on the discipline's future.[36] The main similarity of the selected universities is that they are conducting close research with architecture and contribute on their relationship. By looking at their calendar, events, exhibitions, and syllabus through their digital archives, the research

[36] This investigation and programs can be multiplied. The selection here considers the oldest or most significant programs in US and Europe by paying attention to the bond of them with the architecture programs. It neglects the fact that this classification can be done according to many other topics like the accreditation of discipline, having a graduate or undergraduate program, etc.

tries to investigate the particularities and differences of them. While having an important role, their impact, size, and network creates different disciplinary borders. This study is not a comparative study between different institutions. Instead, by acknowledging various perspectives of leading discussions, the study reveals the unique features of outstanding institutions.

2.3.1 Landscape Architecture Programs

As the first established and named 'landscape architecture' program in the world with the aim of engaging urbanism, environmentalism, and culture; **Harvard University,** Department of Landscape Architecture currently continues to be a leading department that investigates the developing contexts of the discipline. It puts forward its mission as, "to advance research and innovative design practices in the natural and built environments, as they intersect with processes of urbanization."[37] The institution define that the traditional disciplinary boundaries mostly do not correspond the challenges of the built environment. For that reason, the coursework spans the depth and breadth of the field and aims to create "strong pedagogical connections to urban planning, urban design, and architecture."[38] While the standing point of the institution is critical in terms of the evolution of the landscape architecture discipline, it operates as a separate program.

Giving importance to the onsite investigations, the studio structure (discussions on emerging landscapes) is supported with travels to a different region around the world. According to their program definition, they argue on the importance of exploring multiple ways that landscapes contribute to the complexity of the

[37] n.d. Accessed December 17, 2021. https://www.gsd.harvard.edu/landscape-architecture/.
[38] Ibid.

contemporary city, to the equitable distribution of ecological and environmental resources, and to the creation of a better future.

Since the establishment of the program, the practicing scholar's contribution to the university has a great impact on the course schedules and studio works. Besides the faculty members, the program also benefits from the ongoing events, has access to and engagement with the extra-departmental assets of the Graduate School of Design. These include an intense calendar of lectures, exhibitions, and events that relate to current design culture across disciplines. The publications: New Geographies, Harvard Design Magazine and Studio Reports periodically compose new ideas, research, and share them. Their podcast series: Design Now, Future of the American City, The Nexus and Talking Practice are also important contributions to the design field that constructs a discussion ground which cross the borders of GSD to share ideas.

Figure 2.6 Harvard University Campus area. Produced by the author.

Boston's green structure has an important role on the discipline's history and current research position. Several unique resources and assets are part of the Department's coursework and culture, such as the Harvard Forest, the Arnold Arboretum, the Harvard Center for the Environment, and Dumbarton Oaks.[39] The forest provides a research area which suggests a hands-on landscape experience. The provoking location, history and network of the university supports the research and sets the role of the university to lead the discussions around the world.

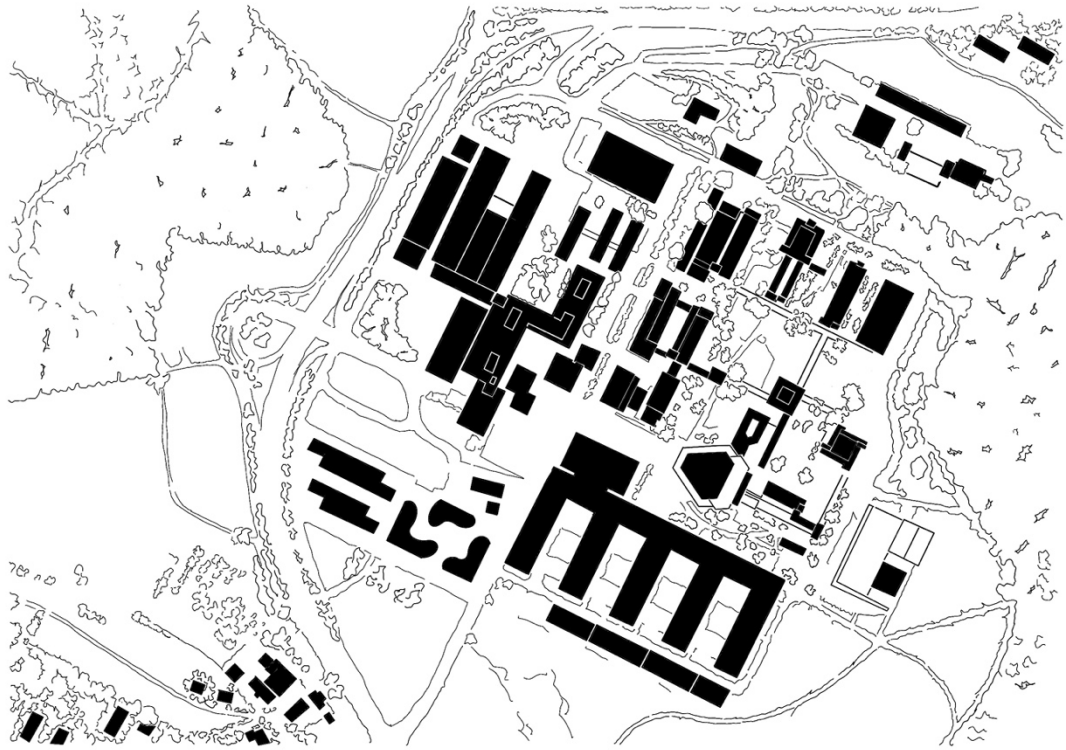

Figure 2.7 ETH Zurich, The Hönggerberg Campus. Produced by the author.

One of the most important landscape architecture programs in Europe is at **ETH Zurich**, Institute of Landscape and Urban Studies. The main differing character of the university is their involvement in digital tools. Master's in landscape architecture

[39] Ibid.

and PhD program is, while focusing on design and planning of open spaces, concerned with the large-scale environment. It engages with a variety of fields

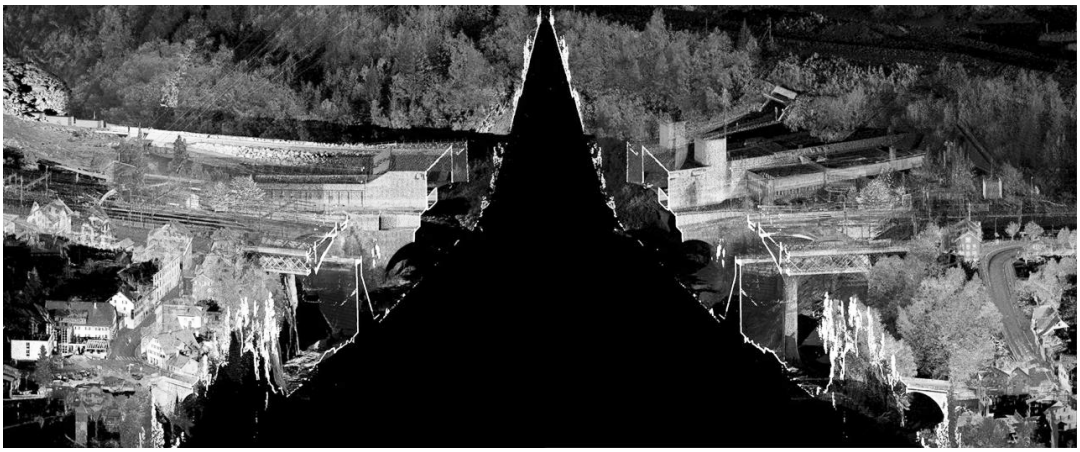

Figure 2.8 A section on point cloud model of Göschenen, Switzerland. (Source: Girot, Christophe. 2013. *The Elegance of Topology.* Vol. 3, in *Topology: Topical Thoughts on the Contemporary Landscape*, 79-115. Berlin: Jovis.)

ranging from cities and other urban areas, landscapes and territories, and policy making. Landscape and Urban Studies is part of the Network City and Landscape (organized in 2002), which also includes the Chair of the History and Theory of Urban Design at the Institute GTA and two Institutes of the Department of Civil, Environmental and Geomatic Engineering. It is defined as a driving force in the new Future Cities Laboratory Global, a research project intended to continue the Future Cities Laboratory founded in Singapore in 2010.

The chair of the landscape architecture program, Christophe Girot, is a key faculty in this research since he is dealing with new methods concerning landscape architecture and topology, new media in landscape analysis and perception. Girot states that they are focusing on large scale landscape design and modeling methods, with a particular emphasis on the topology of nature in and around cities.[40] The LVML (landscape visualizing and modeling laboratory) of the ETH funded by the

[40] n.d. Accessed July 28, 2022. https://girot.arch.ethz.ch/?team=christophe-girot.

Swiss National Science Foundation shared by the Department of Architecture and the Department of Civil Engineering and Geomatics[41] has enabled significant advances in point cloud modeling and applied landscape design. Researchers have achieved groundbreaking results in point cloud design, modeling, and acoustic sensing.[42] Figure 2.8 shows a section on point cloud model of Göschenen, Switzerland.

[41] The field is described as of comprising geographic information science and cartography, geodesy and navigation, cadastral and land surveying, engineering geodesy and geomonitoring, remote sensing and photogrammetry. (n.d. Accessed July 28, 2022. https://baug.ethz.ch/en/studies/geomatics.html.)

[42] n.d. Accessed July 28, 2022. https://girot.arch.ethz.ch/?team=christophe-girot.

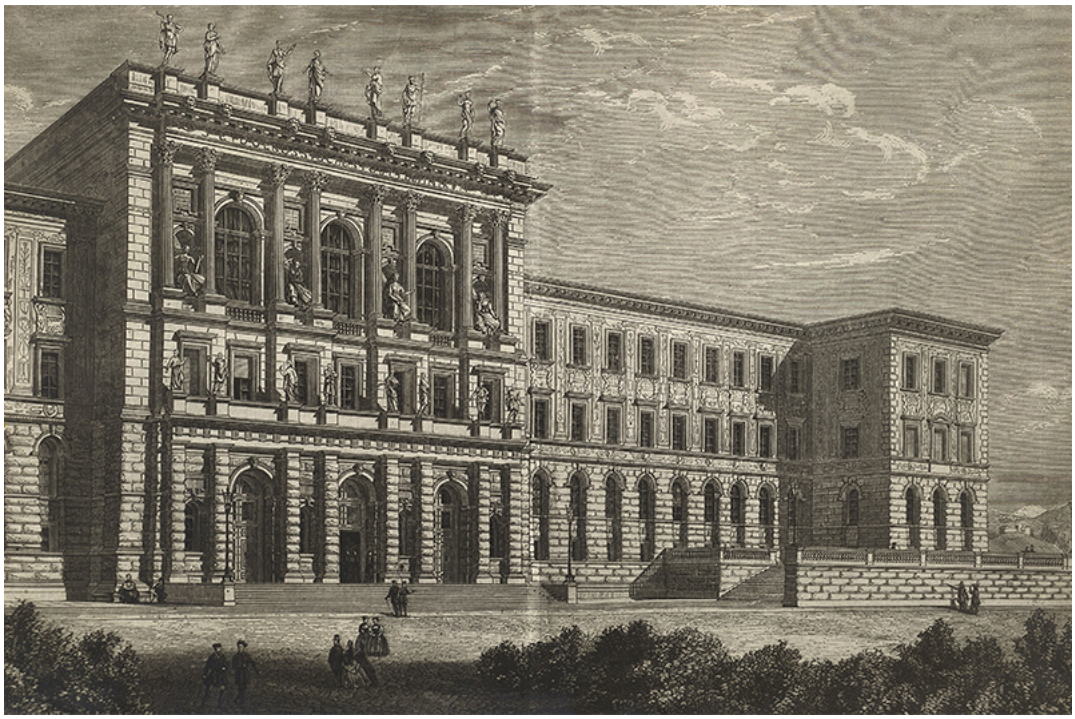

Figure 2.9 Illustration of the main building of ETH Zurich. (Source: https://ethz.ch/en/news-and-events/eth-news/news/2014/06/temple-to-science.html)

The main building of ETH Zurich was built between the years 1858-1864 designed by Gottfried Semper (1803–1879). At the beginning it was not located in the city center but with the growth of the city and the university, the building started to be integrated to the city. Currently the department of architecture and landscape architecture of the university is in Hönggerberg Campus which was built on the outskirts of the city between 1964-1976.

Another very important university with a great impact on the development and transformation of the discipline is the landscape architecture program at **TU Delft**. Landscape Architecture has been a part of the curriculum since the 1940s which became a complete masters track in 2010 where the aim is to anchor architectural quality in the urban landscape. As part of the Landscape Architecture track, students design spaces influenced by **nature, art, and technology** with the formal, material,

and cultural characteristics of the site serving as their inspiration.[43] The book "Celebrating 10 Years of Landscape Architecture Education" renders the evolution of the Landscape Architecture masters track at TU Delft with examples from student works, general profile of the program and their academic staff.

They argue that the ability to spatially organize and architecturally process networks and infrastructures make landscape architecture indispensable for current spatial issues. The course schedule is organized according to the profession as it encompasses dwelling, work, infrastructure, recreation, nature, and water landscapes at various scales and at different planning levels: from architectural ensembles including the garden and urban fragments to metropolitan park and water systems. In practice, landscape architecture plays a role in all these areas, with varying intensity and in various stages and plan forms. Exactly this **'coordinating role'**, in a world becoming more and more complex, is needed.

[43] n.d. Accessed July 28, 2022.

https://www.tudelft.nl/en/education/programmes/masters/architecture-urbanism-and-building-sciences/msc-architecture-urbanism-and-building-sciences/master-tracks/landscape-architecture.

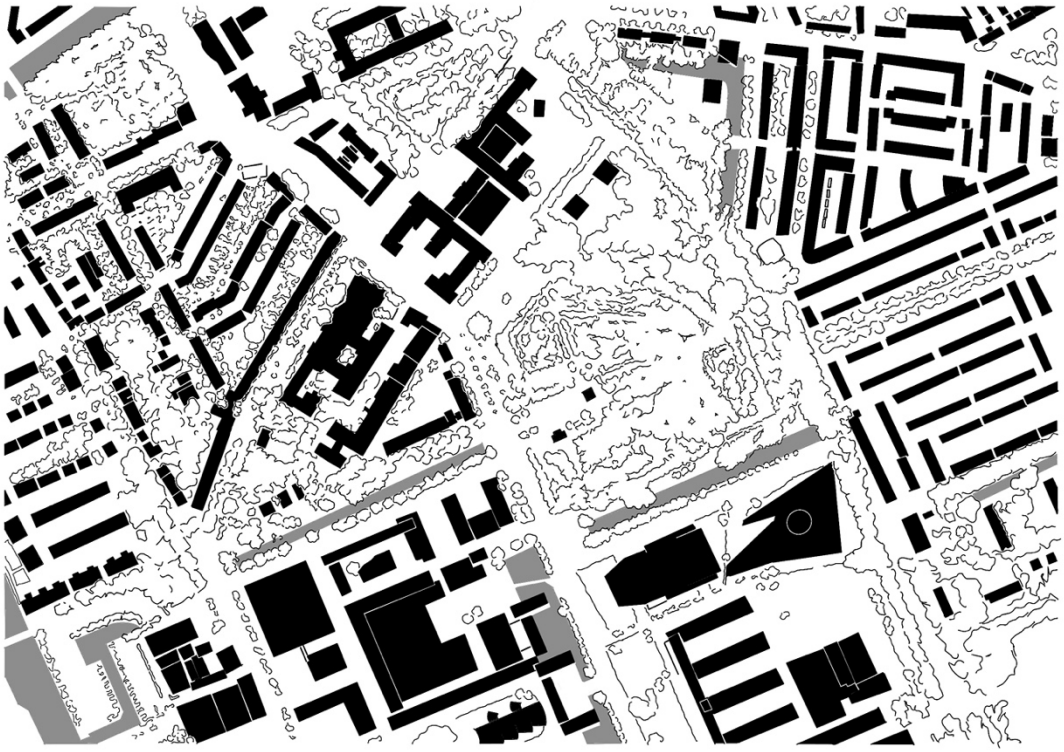

Figure 2.10 TU Delft Campus and its surrounding. Produced by the author.

This coordinating role represents the revealed systems of nature itself and systems that are developed to prevent natural disasters and changes due to climate change. The Netherlands has a unique location for water management and requires design solutions to prevent floods from the sea and rivers. Nico Tillie, who is a member of the Faculty of Architecture and the Built Environment and Urban Ecology Lab, states that the campus of TU Delft should serve as a living lab for the future of cities. The lab is working by considering the natural systems and how they can structure the campus according to the future of it.[44]

Location of The Campus is surrounded with water canals and parks as well as an arboretum that is used as a research area. Their research on the city of Delft regarding

[44] n.d. Accessed July 27, 2022. https://www.tudelft.nl/en/delft-integraal/articles/okt-2021-naar-de-natuur/view-of-nico-tillie.

the water canals has an important impact on the future of The Netherlands. Landscape Compositions and Systems is a landscape architecture research program that aims to establish a critical body of knowledge that will enable landscape architecture to respond to contemporary societal problems within the built environment. The research group is exploring and developing the foundations - theory, methods, and tools - of landscape compositions and systems in the built environment.[45]

Each of these institutions are working on extending the field of landscape architecture with solutions for environmental issues by using their location as an investigation area. According to the problems that they are dealing with, they extend and specify the field of the discipline in their university. Their campuses have strong connections with the public they are interacting with. By providing open public spaces and specialized green structure, each of them has a unique curriculum with related exploratory lands.

2.3.2 Landscape in Architecture Programs

Taking the landscape architecture programs into consideration, its recognizable that nowadays the architectural programs that are leading the discussions around the world are also engaged with the same issues. Due to social and cultural necessities, environmental and technological changes, the need for a more integrated program that embraces a wide perspective becomes crucial.

Being aware of the framework, it is possible to note that architecture programs also share the similar contents with landscape architecture.[46] By only looking at the

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[45] n.d. Accessed July 28, 2022. https://www.tudelft.nl/bk/over-faculteit/afdelingen/urbanism/organisatie/secties/landscape-architecture.

[46] In this part the selected programs are considered due to the author's personal experiences.

Architectural Design Studio at **Columbia University**, Graduate School of Architecture, Planning and Preservation, the similar research topics are remarked. The graduate programs in GSAPP does not have an autonomous landscape architecture track. However, the architectural design studios are concerned with transdisciplinary cooperation which has a common ground with landscape architecture. Some of the architectural studio topics from 2020 can be listed as; 'R/Urban Ecologies', 'The XR School climate change', 'An urban factory', 'Infrastructural Geographies',' From Landscape to Architecture from Architecture to Landscape', 'Design for Obsolescence - Dual Futures of Parking Decks, Prisons, Zoos', 'In the name of GOD - An Investigation to a Rural Religious Settlement', 'Scales of Environment', 'The Space of Water'.

Master of Architecture at GSAPP is framed as "exploring both academic and professional concerns through a set of inquiries and premises: architecture and its design practices are critical in addressing contemporary challenges; architectural specificity is the result of transdisciplinary cooperation; architecture's future agency lies in the discipline's capacity to mobilize realities across different scales and time frames."[47]

According to their Advanced Design Studio brief, from spring 2019, fundamentally the programs are focusing on "Architecture and Environment". For a shared discussion about architecture's engagement with the world, the brief states that Architecture and Environment built on the hypothesis that climate change is ground zero. By addressing climate change through design each studio constitutes its own world. These worlds are structured by technical aspects (energy consumption and carbon footprint) as well as social and political aspects (inequality and public policy).

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[47] n.d. Accessed July 27, 2022. https://www.arch.columbia.edu/programs/9-m-s-architecture-and-urban-design.

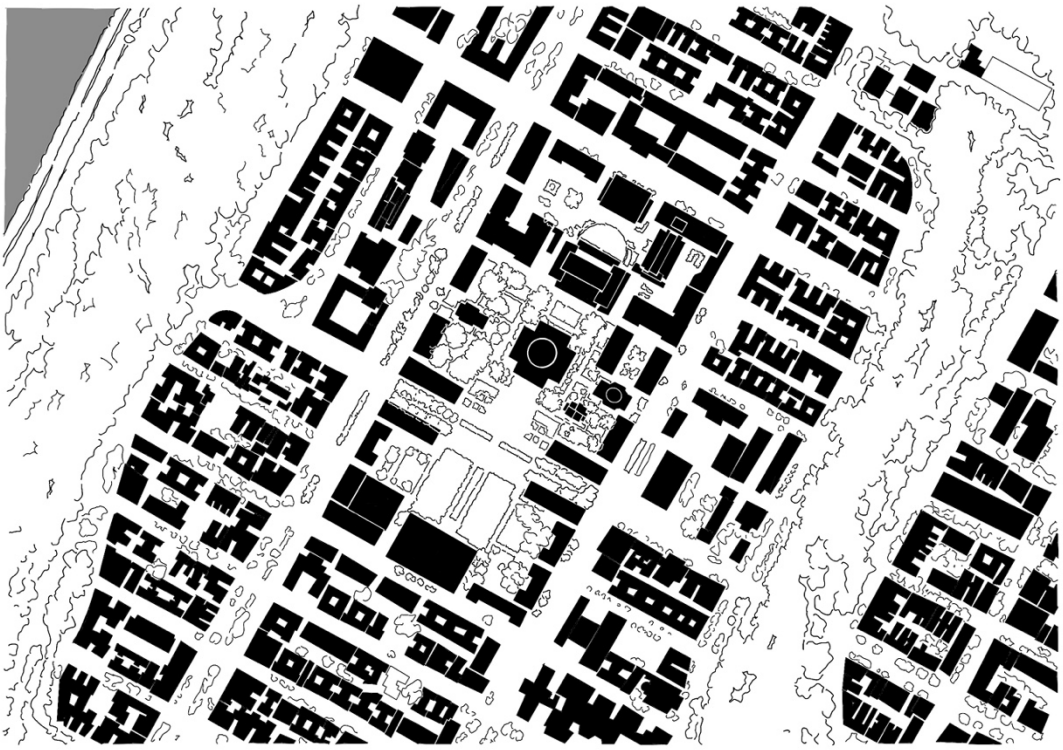

Figure 2.11 Columbia University Campus in New York City and its surrounding. Produced by the author.

The university is located in New York City, district of Harlem benefiting from the multicultural environment of the city which is always in flux. The campus takes space of two Manhattan blocks and the buildings settles on the borders of the block that creates a large courtyard. The courtyard is supported with smaller lawns and courtyards between the buildings. As well as them, the statement of "New York City as the campus of Columbia University" and its proximity to Central Park, Riverside Park and Morningside Park gives the university a unique location.

As an opposite example to Columbia University in terms of Campus development but similar approach to the curriculum in architecture program, **Middle East Technical University**, Department of Architecture, lead the discussions. Columbia University is located in the City of New York and considering the city as their Campus and METU constructed its own mostly enclosed environment with its forest, both of them has a constructed ground specially operating as an investigation area both with its natural and artificial elements.

The Arch 401-402 Architectural Design Studios look for ways in which the design exceeds the ongoing disciplinary boundaries of architecture with an interdisciplinary group of instructors[48]. With the collaboration of engineers, architects, landscape architects the studio focuses on understanding the depths of architecture with different disciplinary approaches. Acknowledging recent planetary challenges necessitate a common design act which introduces the ground as operating a shared transdisciplinary milieu for mutual dialogue.

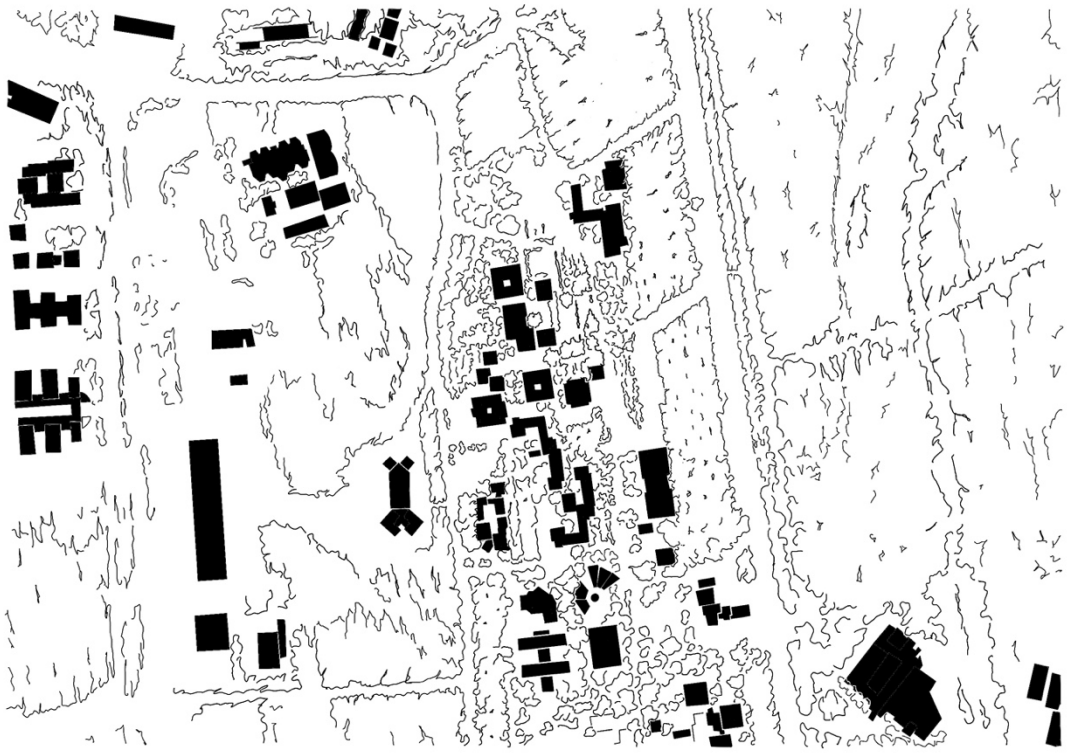

Figure 2.12 Middle East Technical University Campus, Ankara and its surrounding. Produced by the author.

[48] – Ayşen Savaş (coordinator, architect), Arzu Gönenç Sorguç (engineer), Funda Baş Bütüner (landscape architect), Emre Erkal (engineer, architect), Nesli Naz Aksu (architect, landscape architect) and Sezin Sarıca (architect)

Ayşen Savaş and Güven Arif Sargın, who are both architects teaching at Middle East Technical University, has significant studies on the campus. In their article, "A University is a Society': an Environmental History of the METU 'Campus'" they discuss the impacts of the campus design and how it generates a society within the city, Ankara. They state that,

> *the university was designed as a total entity, a three-dimensional modern grid spread over the barren Anatolian prairie, and, in half a century, succeeded in transforming its immediate environment into an 'ideal landscape'*[49]

Even though it is different from the other examples, METU is another outstanding campus that inspires the relationship of landscape and architecture.

These different approaches represent the wide field of interest for both disciplines. Each of them signifies the importance of new technologies, current environmental crisis, and the need of a **coordinating role**. All taken into consideration, it is necessary that the changing borders of both disciplines should be acknowledged. However, to further develop the studies, the set of vocabulary that challenges the working areas of architecture should be clarified and adjusted to current conditions of architecture and landscape architecture. Nature and its elements, in this case, is the most crucial element to understand and unfold their relationships.

The relationship of disciplines in these universities and their ground is unique in each case, but their main goal is to provide a research area within the cities both for architects and landscape architects while discovering their relationship. The selection can be expanded to different geographies, and examples can be multiplied. However, each case creates a different scenario both with their curriculum and

[49] Guven Arif Sargin, and Aysen Savas. 2013. "'A University is a society': an environmental history of the METU 'campus'." *The Journal of Architecture* (Routledge) 18 (1): 79.

experience ground. These scenarios change to propose solutions in relation to where they are located and what are the needs of emerging landscapes.

2.4 Discovering New Grounds

'Ground' as the foundation of this research is discussed both literally and conceptually. Primarily it addresses the paradigm shifts and changing grounds of the discipline of architecture and landscape architecture. By understanding the depths of historical, practical and academical developments of both disciplines it suggests a topological ground that does not differentiate them. This topological ground is cultivated together other disciplines and brought them together.

As the 'Earth's Ground', it questions the interactions on/of water, earth, and air. Following the ongoing investigations on the ground, it refers to the depths, systems and networks covering the continuities and connections of existing under/belowground natural and artificial elements of landscapes. Topology is used to unpack these continuities and connections, dispose the hierarchies and oppositions of dualities, and construct a new structure.

Robin Dripps, who is teaching at University of Pennsylvania, School of Architecture, in her article "Groundwork" that was published in the book "Site Matters" edited by Carol J. Burns and Andrea Kahn, mentions that most of the discussions on architecture has omitted ground and she states the importance of ground that engages with architecture and become a part of it.[50] She explains the ground as,

> *Grounds operate with great nuance. They resist hierarchy. There are no axes, centers, or other obviously explicit means of providing*

[50] Robin Dripps. 2005. "Groundwork." In *Site Matters: Design Concepts, Histories and Strategies*, edited by Carol J. Burns and Andrea Kahn, 59-92. London, New York: Routledge: 59.

> *orientation. Single, uncomplicated meanings are rare. Instead, there are open networks, partial fields, radical repetition, and suggestive fragments that overlap, weave together, and constantly transform. Within this textural density edges, seams, junctures, and other gaps reveal moments of fertile discontinuity where new relationships might grow. Relationships among grounds are multiple, shifting, and inclusive. They engage the particular and the concrete rather than the abstract and the general.*[51]

Her argument leads to further study the conditions where architecture is not only a part of the ground, but it becomes the ground. It produces overlaps, transforming and weaving together. These arguments bring the question of 'ground line' that is thick and inclusive. That thick line creates spaces and contains both natural and artificial features that are interlaced. Stan Allen discusses this in his article 'Field Conditions' as the thick 2D stating that "the new institutions of the city will perhaps occur at moments of intensity, linked to the wider network of the urban field, and marked by not by demarcation lines but by thickened surfaces."[52]

2.4.1 Nature's Coordinating Role

In order to understand the difference of landscape and nature by looking at the contemporaries; James Corner's article "Terra Fluxus" is critical as well as Joel Sanders' article "Human/Nature: Wilderness and the Landscape/Architecture

[51] Ibid. 71.

[52] Stan Allen. 1999. *Points+Lines: Diagrams and Projects for the City.* New York: Princeton Architectural Press: 98

Divide" on wilderness. James Corner[53], who is a landscape architect and theorist, mentions Victor Gruen's definition of "landscape" as not being the "natural environment" but being the "environment in which nature is predominant." According to him nature is a moral as well as practical antidote to the corrosive environmental and social qualities of the Modern City and is mostly represented by a softly undulating pastoral scene which is the city's "other," it's essential complement drawn and excluding building, technology, and infrastructure.[54]

On the other hand, Joel Sanders' article discusses the roots of landscape/architecture divide in order to go beyond it. According to him, wilderness is one version of the human/nature dualism, and it reinforced the Western conception of buildings as constructed artifacts qualitatively different from their ostensibly natural surroundings which creates the dilemma of untouched nature as wilderness and designed nature. He mentions William Cronon who puts forward the relationship of landscape and nature as: "If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not."[55]

Diana Balmori, both a practitioner and an academic landscape architect, in her book a Landscape Manifesto published in 2010, criticizes the Modern Movement by putting forward the divergence between architecture and landscape. An object (architecture) standing on a flat plain (landscape) they are slashed apart as Modern

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[53] Charles Waldheim in his book Landscape Urbanism mentions that his research on contemporary landscape and its increasing relevance for questions of the city has been central to the formulation of landscape urbanism.

[54] James Corner. 2006. "Terra Fluxus." In *Landscape Urbanism Reader*, edited by Charles Waldheim. New York: Princeton Architectural Press: 26.

[55] Joel Sanders. 2011. "Human/Nature: Wilderness and the Landscape/Architecture Divide." In *Groundworks Between Landscape and Architecture*, edited by Joel Sanders and Diana Balmori. New York: The Monacelli Press: 16.

Movement's invention.[56] A significant example is Villa Savoye which was designed by Le Corbusier (1887-1965) who is a Swiss-French architect designed Villa Savoye at the end of 1920's. The villa is elevated with pilotis to free the ground where the relationship of building and land is detached. Another example is Peter Eisenman's theory, cardboard architecture where he explores the relationship amongst elements such as plane, line, column, or volume. To do that he suggests freeing the architecture from physical conditions and programs where it is detached from its surrounding.

In reference to these examples, 'Groundwork: between Landscape and Architecture' written by Diana Balmori and Joel Sanders, where they are working together on the bond between architecture and landscape both in their practice and academic career, discusses Modern architecture and Modern landscape as two unequally matched disciplines, together reinforced the nature/culture, mind/body dualism by confirming nature and architecture as fundamentally opposite bodies.[57]

In terms of the relationship of nature and the city; both James Corner and Diana Balmori mention that landscape brings the city into nature. Balmori in her book *A Landscape Manifesto*, discusses the relationship of nature and the city by stating that landscape's task in cities today is remarkably different, even though the city is still its focus. In her own words:

> *It is not about creating parks. Nor it is about greening cities. Instead of embedding nature in the city, it is about embedding the city in nature. It is not about planting trees, but it is about creating a*

[56] Diana Balmori. 2010. *A Landscape Manifesto.* Connecticut: Yale University Press.

[57] *Groundworks Between Landscape and Architecture*, edited by Joel Sanders and Diana Balmori. New York: The Monacelli Press: 16.

different relationship between landscape and its elements (water, earth, air) and the city.[58]

In order to understand landscape and nature in relation to their elements, in his book *The Critique of Aesthetic Judgement*, Immanuel Kant explains the beauty in nature as the sublime which is a type of aesthetic experience. According to him the sublime names the experiences that overwhelms us like violent storms or huge buildings and distinguishes them into two as 'mathematical' or 'dynamical'. The mathematically sublime is overwhelmed by size such as "shapeless mountain masses" and the dynamically sublime is overwhelmed by force as it is in the case of "boundless ocean heaved up" or "hurricanes with all the devastations they leave".[59] He expands his idea on the beautiful and the sublime by stating that the beautiful in nature concerns the form of the objects (being bounded), but the sublime can also be found in a formless object (unboundedness). In the case of the beautiful our liking is connected with the presentation of quality, on the other hand in the case of the sublime, it is connected with the presentation of quantity.[60]

Architecture is a discipline that designs according to given or found information of the land, measures every detail, and draws in scales. The aesthetics comes either from the ratio discovered by the architect or its attachment to the ground itself. When the attachment is strong and operated by existing conditions it is more than beautiful, it is unbounded and subliminal. Discovering new methods of reading and operating on the ground helps generate new grounds for architecture.

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[58] Diana Balmori. 2010. *A Landscape Manifesto.* Connecticut: Yale University Press.

[59] Immanuel Kant. 1987. *Critique of Aesthetic Judgment.* Translated by Werner S. Pluhar. Indianapolis/Cambridge: Hackett Publishing Company. 261.

[60] Ibid, 98.

2.4.2 Elements of Nature

By looking at the meaning of landscape, without its disciplinary boundaries the bond between architecture and nature becomes significant again in the twenty-first century. This brings the discussion of the relationship between landscape, nature, and architecture to the surface once more but this time their meanings are tending to mix or come together.

Referring to the definitions of architecture and landscape, a reductionist approach is to look at the meaning of a term 'land-arch' in Megapolis Dictionary of Architecture. It names the bond as a contract between architecture and landscape which is a hybrid one; either architecturalizing the landscape like modeling, cutting, and folding or landscaping the architecture such as lining, enveloping, covering.[61] By this, a shift of relationship between architecture and landscape to architecture and nature occurs.

Understanding how nature works in the sense Kant explains as the subliminal experiences and their forces, is an important factor in embedding the city into nature or the other way around for them to work together. If architecturalizing landscape and landscaping architecture does not consider the accumulated material and cultural layers that already exist in a site, it means that it has many deficiencies. By considering natural systems, tools to evaluate and transform the existing situation should be found.

In order to understand this dual relationship, it is important to consult on geography and geology since they are the supplementary disciplines. Geology investigates the deep layers of Earth and formations of its elements and geography looks into the lands, their features and relationship with people. Looking at the systems of earth, vertical layers of geology and horizontal layers of geography becomes crucial. Their

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[61] Manuel Gausa, et al. 2003. *The Metapolis Dictionary of Advanced Architecture.* Translated by Edward Krasny. Barcelona: Actar: 379.

integration brings the “essence of ground” that is aware of the particularities of land. Revealing these particularities between vertical and horizontal layers of land introduce systems that are three-dimensional and lead to flexible strategies.

Systems of earth are analyzed in five layers which are geosphere, biosphere, cryosphere, hydrosphere, and atmosphere. They interact to produce the environments we are familiar with. As well as being overlapped they are also interconnected. These interconnections show the natural forces and natural elements that will give clues on the relationship of artificial and natural grounds. For example, the article “Earth’s Systems” states that,

> *when a parcel of air in the atmosphere becomes saturated with water, precipitation, such as rain or snow, can fall to Earth’s surface. That precipitation connects the hydrosphere with the geosphere by promoting erosion and weathering, surface processes that slowly break down large rocks into smaller ones. Over time, erosion and weathering change large pieces of rocks—or even mountains—into sediments, like sand or mud. The cryosphere can also be involved in erosion, as large glaciers scour bits of rock from the bedrock beneath them. The geosphere includes all the rocks that make up Earth, from the partially melted rock under the crust, to ancient, towering mountains, to grains of sand on a beach.*[62]

Within the layers of Earth, elements of nature are also a part of the constructed landscapes as both being a physical entity like sand, rocks, trees and as forces and flows of nature like air that converts the land, changes sea levels. Human existence also affects these actions in different scales. In larger scale, while urbanization triggers global warming that cause melting of glaciers in smaller scale, they shape

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[62] n.d. *National Geographic.* Accessed July 20, 2022. https://education.nationalgeographic.org/resource/earths-systems.

the land that forms the built form. Their effects can be multiplied and cover extensive impact areas.

The interconnection of these geographical relations gives clues on the suggested elements. Elements that are converting the land form are both architecture and landscape. As stairs and walls provide the perpetual change of the land, green also becomes a part of a room. Elements cannot be assigned to any discipline, once they are used to transform the land, they become a part of neither one condition nor another. In this regard, instead of walls, doors, stairs; folds, nets, blobs become significant, and these new conditions are the ones to be expanded to constitute a new set of tools and elements for designing and understanding the landscapes.

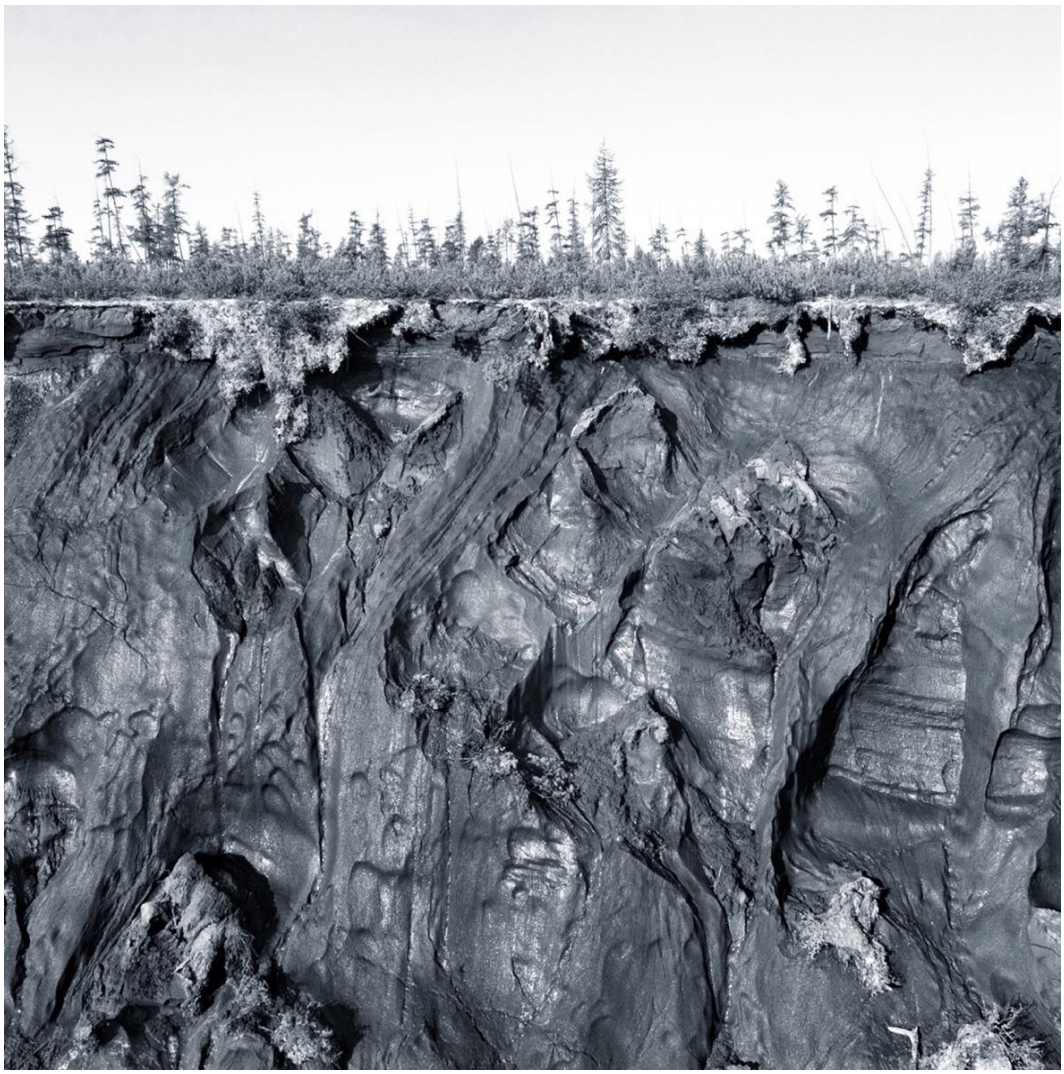

Figure 2.13 permafrost. (Accessed in 18.06.2020 source: https://www.nationalgeographic.com/science/article/arctic-thawing-ground-releasing-shocking-amount-dangerous-gases)

The image in Figure 2.13 shows the crater that caused by thawing of permafrost. The layers within the ground that was once hard soil, thick with ice was holding the organic remains of seeds, leaves, grasses, and animals that died thousands of years ago. By heating up, sinking, and filling with rain and snow the ice melted and the remnants revived. This change, by reviving the ground cause the release of greenhouse gases and has the potential for landslides over short period of times.

These interactions create the land form where built form is also becoming an integrated part of it. Regardless from the fact that being natural or architectural they both contain the same elements, but their formations are different. This reading is not only surficial but also four dimensional that covers formally the deep land and sky, conceptually the memories and cultures of that lands.

Figure 2.14 ‘Gomero de la Recoleta’ Ficus elastica planted around the end of 18th century in Buenos Aires. Photo taken by the author in 2016.

As mentioned before until the end of the nineteenth century, the roots of landscape architecture were related to gardening and evolved/changed over time; in relation to these developments the bond between artifact and nature has also constantly changed which affected the relationship between architecture, landscape, and nature. In this

regard, the threshold in between them as bounded or not starts to become necessary to discuss as an intervention to nature since parks and buildings in cities are replacing the wild environments. Turner, in his book "City as Landscape: A Post-postmodern View of Design and Planning" brings up parks and boundless space as means of landscape architecture while mentioning its evolution. According to him, imparkments create parks and the world's first park was made when homo sapiens bounded a space by a fence to protect an area of land.[63] This definition is important to understand the first insights of the detachment of landscape and nature. Once a touch has been made to the wild environment, whether by reshaping the existing natural elements or not, its basic features change.

A park is according to Frederick Law Olmsted, where city does not exist that was counter argued by Bernard Tschumi as being somewhere culture takes place instead of nature. A meadow is an open field existing with softscapes. A water source is where first settlements were established to benefit the use of water as infrastructure. A mountain is where the climate changes and transportation get harder. The meanings assigned to elements of nature can vary according to the designer. What is important is that their natural features are used to augment the cities and cultivate the ground.

Frederick Law Olmsted, one of the first and most important landscape architects of the United States, first intertwined cities with parkways to link the parks in Boston. The idea was that the boundaries started to fade away and green space started to spread out to the city. His project Central Park is significant to understand the relationship of city, landscape, and nature as mountains, water source, green areas, and vegetation. It is an artificial landscape; planned and constructed, that was embedded in the city where Olmsted's aim was to create a place for visual

[63] Ibid.

observation both of nature and the city.[64] He contends; the beauty of the park as the 'other' with fields, meadow, the prairie of the green pasture and the still waters are to complement the beauty of the buildings in the city and this complementary yet contrasting 'other' was attributed to landscape architects. As the city developed in time, the park remained almost the same, yet it became even more significant. This relativity of change constitutes the dialogic relationship of natural and artificial elements of the city.

Their co-existence creates hybrid conditions that are the elements of new grounds, neither architectural nor natural. They are landscapes that breaks the hierarchies and oppositions. This break represents the changes required to discover architecture's new ground that is lost due to the paradigm shifts, ecological and cultural crisis, and technological developments. Institutions informs us that architecture has found its lost ground in landscape programs. However, how it will be augmented both in academy and practice is very crucial. Next chapter opens up new discussions on augmenting the architectures ground by looking at different geographies.

[64] Sanders, Joel. 2011. "Human/Nature: Wilderness and the Landscape/Architecture Divide." In *Groundworks Between Landscape and Architecture*, edited by Joel Sanders and Diana Balmori. New York: The Monacelli Press: 17.

CHAPTER 3

UNFOLDING THE LINES: TOPOLOGICAL GROUNDS

"Ecology is urbanism's best insurance policy;
landscape is infrastructure's most flexible strategy."

Pierre Belanger

Continuity and connectedness in architectural theory and related disciplines has been an important topic. Informed from the philosopher's Gilles Deleuze and Felix Guattari, architects such as Greg Lynn, Robert Venturi, Denise Scott Brown, Anthony Vidler has been discussing the topic over these years. Either formally or conceptually relations between different materials, cultures and histories have been discussed, and topology started to take place as a crucial topic of study to further discover them. On some current occasions it was attributed to the topographical forms or on others to some building forms that are suggesting smoothness and fluidity. More than what we see and observe via physical forms, it is important to discover the unseen attributes of them. Topology in this sense is studied to discover the essence of the land in relation to its formal character.

This chapter is formulated around relationships that bring the discussions from two dimensional lines to the discussions on dualities such as dialectic, dialogic, hybrid and diptych relationships that suggest a layered three-dimensional system. This system states that architecture and landscape are no longer different or opposing sides. To represent their coexistence without losing their identity or disciplinary integrity the term topology stands out. Learning from these dualities, topology opens up a new debate on grounds that is living, thick and a four-dimensional system. Here four-dimensionality indicates the changes that are triggered by time and forces. It changes the disciplinary and material bonds and borders of the architectural ground.

The geographies that are very rich in fourth dimension helps investigating and operating on new grounds.

Cities that are built on top of each other throughout centuries -like most of the cities in Anatolia; Antioch, Caria and Istanbul-, lands that are formed with volcanic eruptions -Cappadocia-, lands arise after the melting of glaciers, destructions of the built environment after the earthquakes can be given as some of the examples that defines the unusual changes on ground. This work sees them as topological grounds and to better examine and understand them, it puts forward two definitions: land form and built form. These terms are not new to architectural theory; however, their meaning has evolved in relation to the changing tendencies. They are used to provide the visibility of unseen horizontal and vertical layers of ground.

Strategies for emerging landscapes require an understanding on how to read the ground and represent the ideas. To suggest a strategy, horizontal and vertical lines lead the discussions on discovering the continuity and connections of ground. They act as a hinge to read, understand, and convey ideas for operative grounds. Even though line is one of the most important tools in architectural knowledge, it's usage change according to the strategies for landscapes. Texts, perspectives, plan, and sections are produced via lines. Looking at histories of line and its relation to landscapes, opens up different new discussions on understanding the potentials of lines and landscapes to propose new strategies. While collecting and combining the studies on "lines" and "landscapes", their relation is discovered, revealed, and unfolded.

This chapter acts as a hinge between Chapter 2 and Chapter 4, which learns from the "demarcation line" and discovers the potentials of hinge. By unfolding the line between disciplines and formations it tries to open the discussions on what kind of strategies can be developed to understand topological grounds. To establish or uncover a new way of interpreting the "demarcation line" between different entities, it is critical to understand the relationships on investigating how two things

exist/come together. Starting from diptych and discovering other dualities, particularities on relationships, continuities and connections are studied.

3.1 Horizontal and Vertical Lines

Perspectives, axonometric drawings, maps, sections, and plans are used to study a terrain and present ideas. The most used sections and plans are represented by lines, coordinated with horizontal and vertical sections. The drawn idea conveyed with these drawings is filtered and reduced according to the designer's approach. However, the challenge of representing the complexity of the ground requires a shift from two dimensional drawings to four dimensional systems that are collecting and representing more data.

Peter Eisenman in his dissertation "The Formal Basis of Modern Architecture", originally submitted in 1963, in a theoretical and critical sense examines form in relation to architecture.[65] He analysis different buildings of Le Corbusier, Giuseppe Terragni and Frank Lloyd Wright by redrawing them to discover the formal basis of their architecture. His free hand drawings throughout the thesis constructs the ideas that the dissertation tries to convey. An example of this dual construct is on The Acropolis.

[65] Peter Eisenman. 2006. *The Formal Basis of Modern Architecture.* Zurich: Lars Müller Publishers.

The Acropolis can be considered as the horizontal plane and the columnar grid of the Parthenon as the vertical plane. These then act as the absolute references and provide the perceptual tension to the mountains beyond which may be thought of as 'mass' as the specific condition, this juxtaposition of the specific form -mountains, and the generic form- the columnar grid creates a dialectic situation.[66]

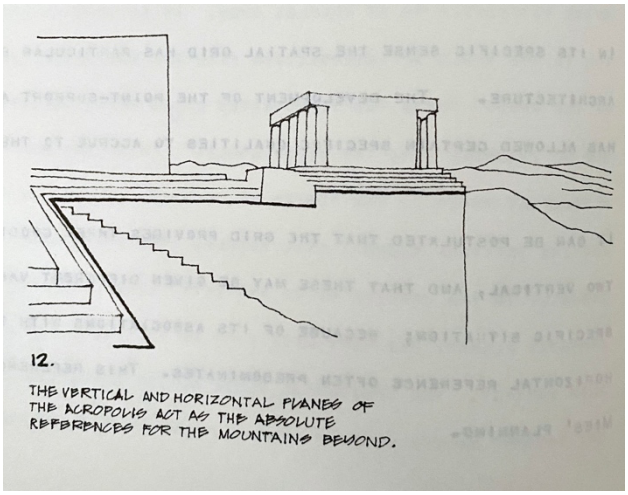

Figure 3.1 (Source: Peter Eisenman, The Formal Basis of Modern Architecture)

Eisenman's horizontal lines represent the stairs of The Acropolis as well as the mountains. While the forms and formations of stairs and mountains are different from each other, their representation becomes similar with lines. The vertical and horizontal planes that Eisenman mentions are also represented via lines however, the vertical and horizontal lines do not give direct reference to the planes. He gives the mountains beyond The Acropolis as a reference to vertical and horizontal planes and he associates these planes to generic form that is in a dialectic relationship with the specific form, mountains.

[66] Ibid. 67.

Marco Frascari explains line as a heuristic device that goes beyond its suggested meaning to discover generative graphics.

> *Pulling pieces of geometry, geology, alchemy, philosophy, politics, biography, biology, mythology, and philology from alien territories, architects should write and draw with hesitation, discovering the multiple aspects of architectural graphesis, a generative graphic process understood in its slow making. The fruitful vagueness ruling architectural graphesis comes from the ambiguity embodied in the Latin spell: nullo dies sine linea, where linea (line), an heuristic device, must be understood as a line of writing, as a line in a drawing or as the pulling of a line on a construction site, but not as linearity.*[67]

One of the most significant examples to these generative drawings can be given as Alexander von Humboldt's drawings. Humboldt (1769-1859), who is a German geographer, has published numerous books as 'Cosmos', 'Views of Nature' and 'Essay on the Geography of Plants'. The most inspiring part of this books is where he presents detailed illustrations of geographies, he visited during his trip to South America with Aimé Bonpland between 1799-1804. Physical, ecological, and social properties of these environments are represented in different Essays after his return from the trip.

His illustrations are depicting the information he has gathered throughout their trip via cross sections, perspectives, texts, drawings, and notes forming a 'tableau'. They collect and represent information that is not only scientific but also empirical on the depths of ground. This layered information is not representing only the spatial qualities of the ground but also the perceptions of Humboldt with juxtaposing the

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[67] Marco Frascari. 2009. "Lines as Architectural Thinking." *Architectural Theory Review* (Routledge) 14 (3): 202.

information he observed. The sectional illustrations read and translate the interconnected perceptions of the nature via his personal narrative.

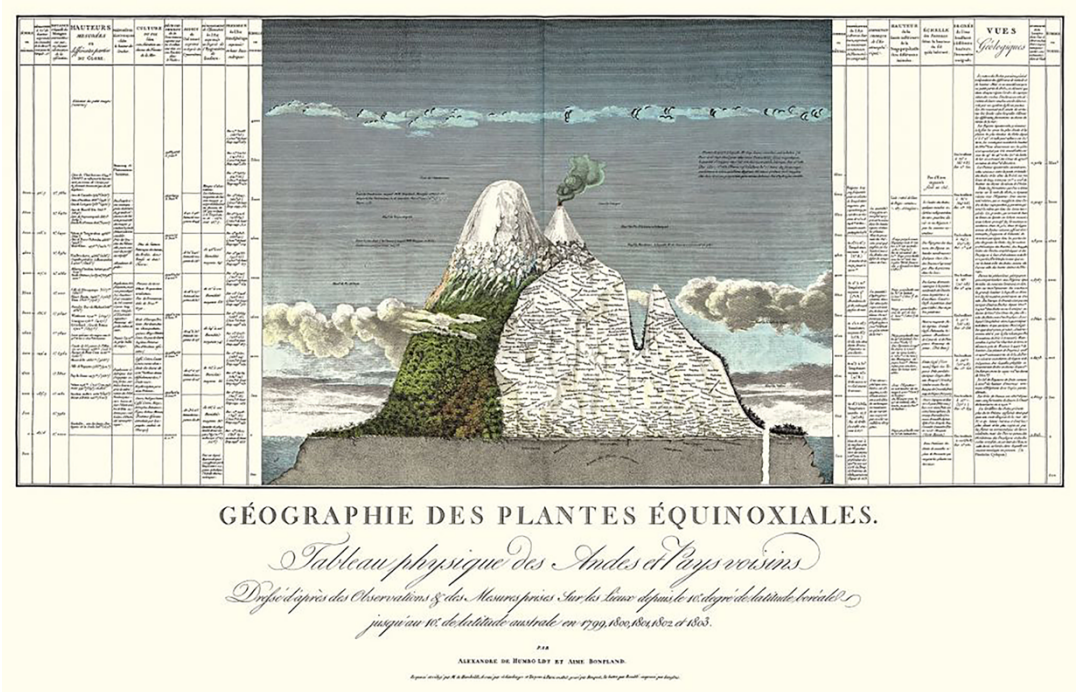

Figure 3.2 Naturgemalde. Tableau Physique of the Andes, Geography of Equinoctial Plants. Alexander Von Humboldt and Aime Bonpland, 1807

Figure 3.2 "A Physical Tableau of the Equinoctial Regions" is explained by Alexander von Humboldt as bringing together the observed physical phenomena both on the surface of the earth and in the surrounding atmosphere.[68] The tableau contains Humboldt and Bonpland's personal observations. It is a compilation of measurements and observations regarding the snowline, vegetation, temperature, altitudes considering climate, soil, flora, fauna, and their interrelation. Even though it looks like a cross section, it collects and connects information beyond that

[68] Alexander von Humboldt and Aime Bonpland. 2008. *Essay on the Geography of Plants.* Edited by Stephen T. Jackson. Translated by Sylvie Romanowski. Chicago, London: The University of Chicago Press: 61.

horizontal line. The text creates a layered ground for the observations and connects the illustrations in sectional and planar dimensions.

In their book "Cartographic Grounds" Jil Desimini and Charles Waldheim looks at the mapping and visualization of data in design culture. They state that it changes the way architects, landscape architects, and urban designers communicate ideas about buildings and landscapes.[69] They state that Humboldt's observations revealed new patterns of vegetation zones in the matter of geology, topography, and climate. His main concern was about the need for an integrated global perspective on ecology which he was trying to express the richly intertwined ecological networks he encountered in the tropics via juxtaposition of text and image.

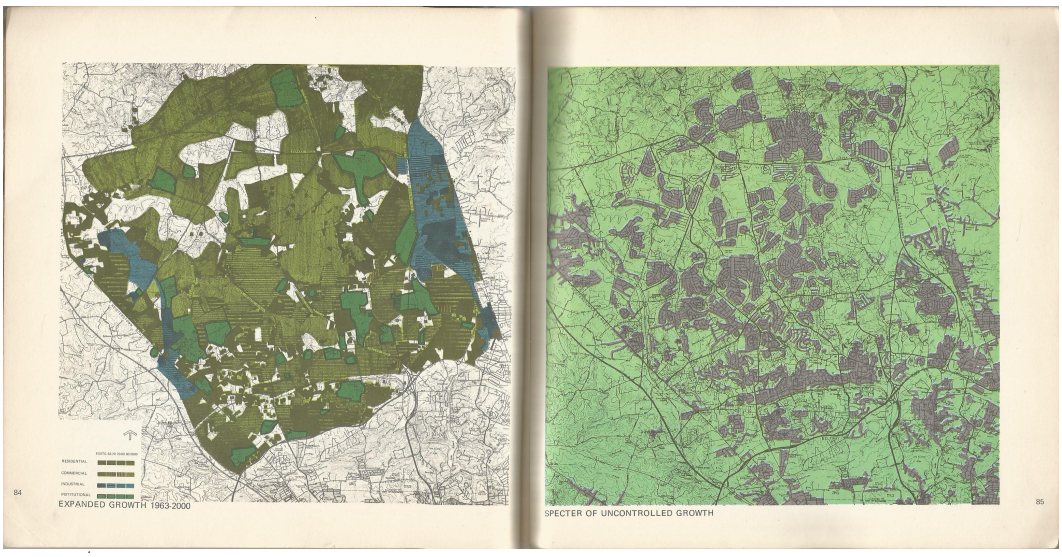

Figure 3.3 Growth patterns by Ian McHarg. (Source: Ian McHarg, Design with Nature)

Following the works revealing the thick line of deep ground, another very significant figure discussing the relationship of man and nature is Ian McHarg (1920-2001).

[69] Desimini, Jill, and Charles Waldheim. 2016. *Cartographic Grounds: Projecting the Landscape Imaginary.* New York: Princeton Architectural Press: 9.

Similar to Humboldt's cross-sectional drawings, McHarg in his book "Design with Nature" published in 1969 overlaid planetary information of land and possible emergent conditions to project on the land's future. These overlays are seeking projections on the relationship of man and its environment. While doing that the book reveals the unseen connections, systems, ecologies, and habitats in relation to cities.[70] Instead of differentiating them or considering separately, he focuses on the human cooperation and the biological partnership.

Another very inspiring geographical illustration is "Tableau Comparatif des Principales Montagnes, des Principaux Fleuves et Cataractes de la Terre" dating back to 1830. It can be translated as *the principles of the mountains, the principles of the rivers and waterfalls*. The tableau combines heights and lengths with the help of texts, lists and observations compares them. The data represented through perspectives are of mountains from Europe, Asia, Africa, and America. It shows the active volcanos, according to the dynamics of the current conditions of mountains in 1830s. In addition, shows the heights of mountains as well as cities and snowlines reflecting the vegetation zones.

[70] McHarc, Ian. 1969. *Design with Nature.* Philadelphia: Natural History Press.

Figure 3.4 Tableau Comparatif Des Principales Montagnes, Des Principaux Fleuves Et Cataractes De La Terre.
(Source:https://commons.wikimedia.org/wiki/File:Tableau_Comparatif_Des_Principales_Montagnes,_Des_Principaux_Fleuves_Et_Cataractes_De_La_Terre.jpg)

The information on mountains is combined with the data of rivers and waterfalls delicately unfolded with comparative features. Where the riverbeds are located, which countries/cities they pass through and the sea that they are connected is combined with the lengths and branches of them. The close ups on Figure 3.5 and Figure 3.6 shows the geographic relations of vertical and horizontal lines of plans and sections with complementary texts of information about their location, height, length, and width. The Tableau narrates the cities, trees, vegetations, mountains, soil types, rivers, waterfalls, and landmarks. It combines the natural and artificial elements of different geographies.

Figure 3.5 close ups of Tableau Comparatif Des Principales Montagnes, Des Principaux Fleuves Et Cataractes De La Terre.

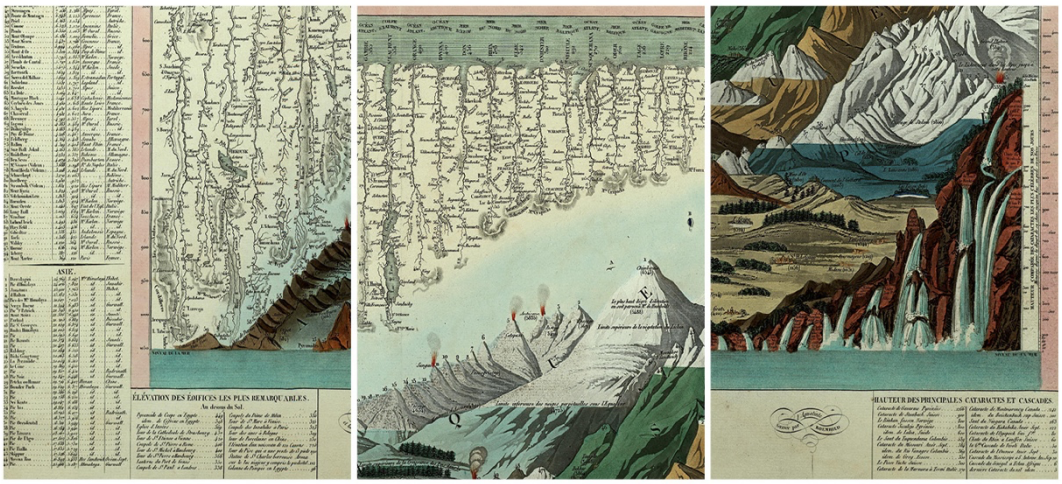

Figure 3.6 close ups of Tableau Comparatif Des Principales Montagnes, Des Principaux Fleuves Et Cataractes De La Terre.

Looking at these examples, geographies with strong historical backgrounds help to discover the thick lines and thick grounds that are rich with horizontal and vertical layers. Significant natural and cultural formations represent the four-dimensional system of those grounds. Antioch, currently known as Antakya, and Cappadocia are one of the many geographies that can be rendered to discover these thicknesses. Both regions hosted various cultures since they were first found around 300 BC. Their significant geography and climate have an important impact on the civilizations and

settlements that has lived in and around these lands with their strong natural and cultural features.

The selected locations are a part of this research process since they were developed not following the end of the research period as case studies, but they helped to develop the theoretical and conceptual ideas throughout the research. The drawings and images were used as an investigation tool on thick lines and thick grounds while trying to propose cultivated landscapes on those geographies. The togetherness of these illustrations is representing the story of the design and weaves the topics throughout the research process and thesis.

3.1.1 Lines of Accumulations: Antioch

Antioch, currently known as Antakya, has hosted many different civilizations since B.C. 300. Greek, Hellenistic, Roman, Mesopotamian, Armenian, Byzantine, Arab, and Turkish cultures has affected the cities change over centuries. These different cultural, spatial, and ecological aggregations created the city's current condition that is still in a state of change. A multilayered culture/nature relationship defines the spatiality of the city. The natural and artificial encounters and spaces of artifacts,

Figure 3.7 Conceptual overlapping maps of Antakya. Produced by the author.

natural elements with the effect of natural forces as earthquakes or changing civilizations contributed to today's physical conditions of the city.

Figure 3.8 Lines of Orontes River. Produced by the author.

Because of its geographic location, throughout different civilizations it became an important city on trade routes such as Silk Road and spice trade. During the Early Roman period the city became one of the largest cities of the Empire with its geographic, economic, and military strength. With the change of trade routes, repeated wars, and changes in borders the city lost its significance during the Middle Ages. Repetitive earthquakes caused the damage on built environment which also affected the future of Antioch. Figure 3.9 collects the data of Antioch's past and changing conditions to discover the depths of current lines and grounds.

The Orontes River is the most important geographic significance of the city. The first settlements built in BC 300 was taking the advantage of water by building around the Orontes River. Being close to the water to use it in agriculture and infrastructure was common during these decades around the world. Amik Valley, with its agricultural potential had a significant relation with the city by the existence of

Orontes River. Catastrophes and changing governments caused the city to be rebuilt in different periods. These new constructions were taking place on top of another. As well as the cities developments, Orontes River and its water flow has changed throughout these years that had a significant effect on the land form and its fertility.

The current condition of Orontes River is segregated from the city. Once filled with productive water structure now detached from the city ground with concrete walls. Figure 3.9 shows The River, its form, and its relationship with its surrounding. The depth and width of Orontes River has changed throughout years by artificial and natural forces. The form takes shape according to geographical conditions as well as cities and agricultural lands. In some parts The River is controlled with canals and concrete walls, in others it is blended with the ground and green.

Due to the tremendous history of the city, the current conditions require deep research on the accumulated seen/unseen layers buried underground. Instead of living on the existing ground and covering the old cities with buildings, delicate research to reveal the significant hidden city structures is proposed. This connects the vertical layers of the city through centuries. As well as the vertical connections horizontally, the city is very fragmented. Figure 3.10 shows a proposal that tries to connect vertical and horizontal layers of the city by understanding historic and current lines. A proposed green structure connects programs and suggests productive recreational areas that changes the cities lost ground. The main idea is by using artificial and natural elements, bringing vertical and horizontal layers of the city together.

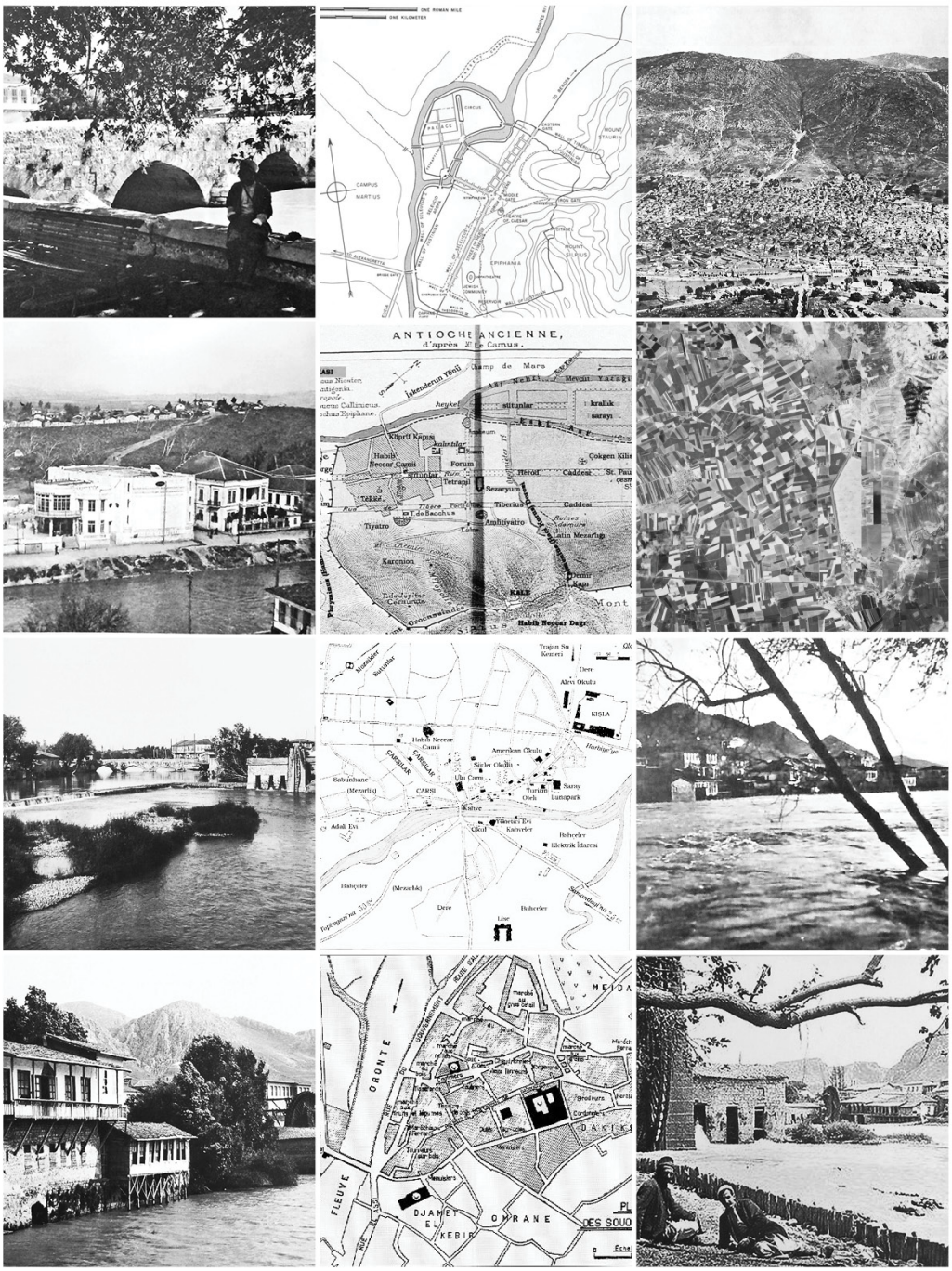

Figure 3.9 Photographs and maps of Antioch. Shows the historical lines of Antioch via photographs and maps from different centuries. Their overlaps reveal the depths of the ground and shows the essence of it. Edited by the author.

Figure 3.10 Lines of Antioch that is the natural and artificial lines that are thick and productive. Edited by the author.

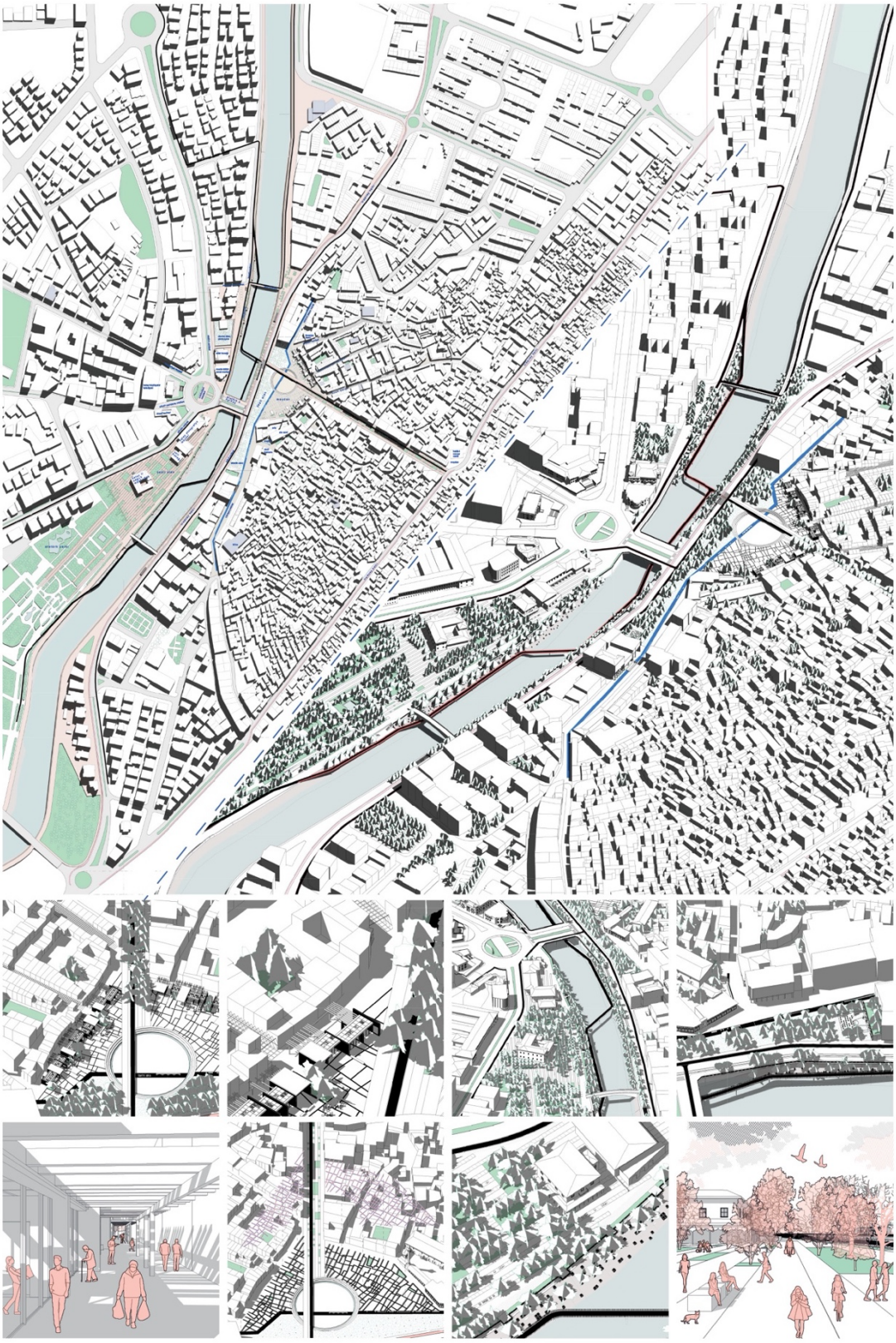

Figure 3.11 The proposal for Antioch. Produced with the team of azaksu architects.

3.1.2 Lines of Carvings: Cappadocia

Cappadocia as a region in Central Anatolia, was bounded with mountains and rivers and was formed by the volcanic eruptions. These eruptions covered the region with thick ashes that turned into a soft rock ‘tuff’. With the natural forces, wind, and erosions the topography was formed and caves, underground tunnels were carved by people that interconnects this topography. Consequently, in response to its unique formations, years after in 1985, the 'rock sites of Cappadocia' have become a UNESCO World Heritage Site.

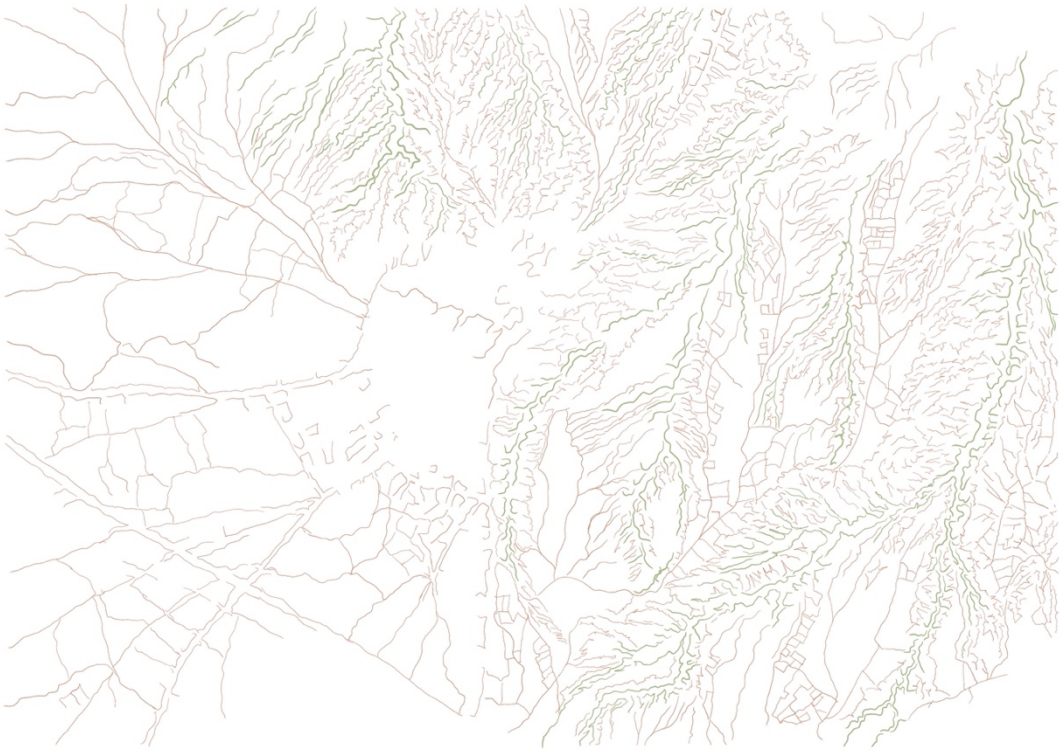

Figure 3.12 Lines of Cappadocia. Produced by the author.

With its unique thick ground Cappadocia is very different from Antioch. As the ground of Antioch is formed by accumulation, Cappadocia’s thick ground is formed by erosions and carvings. The natural materiality of land provides the interventions to sync with its formal boundaries. Moreover, while these thick grounds have different properties, they demonstrate the main idea of multiple horizontal and vertical lines within the ground. Series of vertical cuts of the ground reveals hidden

conditions of the land. Each cut is different from each other and represent the significant topologies.

Thick land of Cappadocia is constituted with architectural spaces formed by the accumulated layers or with the natural forces. Either naturally or artificially formed, rooms, tunnels, gardens, castles have distinctive formations that has curved corners and fluid connections between elements of architecture. Nonstandard openings of caves represent the ground and its significant character. This unique and stunning character of Cappadocia influence various operations on reading and representing the ground different than other cities. Any proposal on these formations considers the depth in terms of character and history of the area.

The formations of these grounds happen in different time segments and paces. While considering the current conditions and reading the ground with vertical and horizontal cuts, another layer of time and pace must be added to represent the character of Cappadocia. Figure 3.13 shows the natural and artificial formations of Uchisar Castle and Argos Hotel. Natural formations are inhabited by people as well as tamed formations that interact with them.

Figure 3.13 Thick ground of Cappadocia. Photographs taken by the author.

The carvings allow various sizes according to scales of the programs they are suggesting. Dating back to Byzantine era, as well as dwellings, the productive grounds of Cappadocia expanded in size and substance which became very

significant. The climate and soil are very suitable for wine and grape production. As well as vineyards covering the grounds, dovecotes, beehives, winepresses are carved as important productive programs of these unique landscapes.

These extremely unique landscape requires discovering and developing different methodologies to understand and project on the ground. Cappadocia stands out with both its natural formations throughout centuries and how these formations are transformed by human. Antioch on the other hand is different and significant with its accumulated cultural layers that undergone various wars, natural disasters, and civilizations. Its location and importance within trade routes has affected the landscapes. Since both these landscapes are still in transformation to work on them, a design methodology to understand was developed. The vertical and horizontal lines and cuts represents the methodology to discover the depths of the ground in sections and plans which is further discussed in Chapter 4.

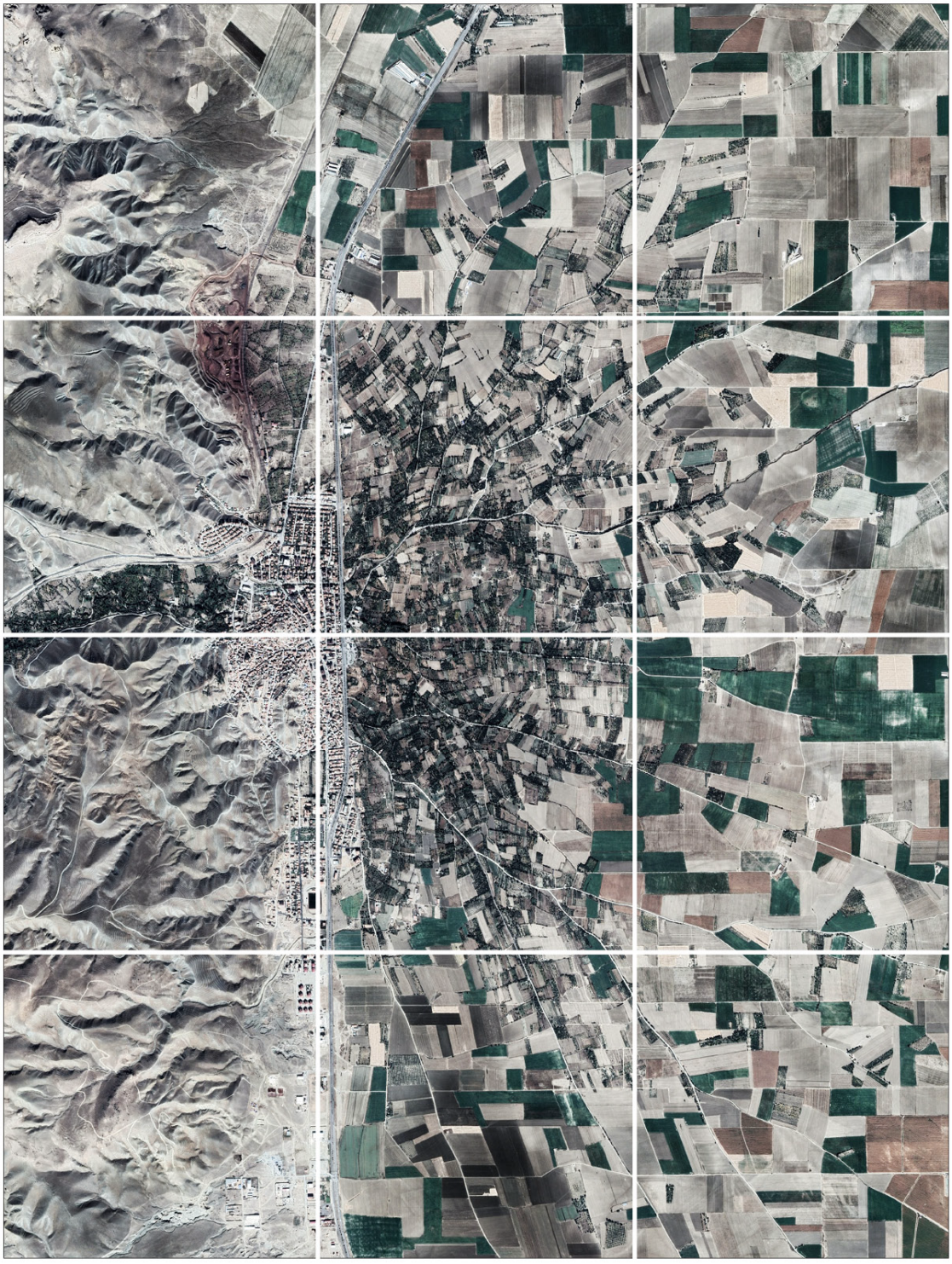

Figure 3.14 Thick lines of Cappadocia. Google Earth image edited by the author.

3.2 Unfolding the Demarcation Line: Thick Grounds of Land Form / Built Form

Following the horizontal and vertical lines, this part discusses theoretical lines as well as material lines that are the most important research tools for architecture. Lines suggests continuities and connections via tracing and weaving to integrate different conditions. Even though dualities considered as representing divisions and breaks, they can bring together and connect. To unfold these lines, looking at dualities is crucial to trace continuities within different time segments and spaces. As one of the dualities, dialectic represents hierarchies and oppositions, on the other hand dialogic puts forward interrelations and circularities where hierarchies and oppositions are broken. To further the discussions, diptych is very crucial in terms of opening up a new discussion for this research. Diptych while brings two different things together, hinge that connects them creates a third thing. As well as diptych, hybrid relationships suggest co-existence of different things where they become something else.

Leon Battista Alberti (1404-1472), the Italian architect and theorist, is known with his writings on perspective and painting and is an important figure to trace line back in architectural thinking. In his book "De Pittura" he composes a section on illustrations, starting from "the point" mentioning "the surface" and many others. He states that "points joined together continuously in a row constitute a line… So, for us a line will be a sign whose length can be divided into parts… If many lines are joined closely together like threads in a cloth, they will create surface."[71] As the relationship of line and surface mentioned by Alberti, same can be said for ground and space. Surface/space here is defined as the thick land. This surface/space is a

[71] Alberti, Leon Battista. 2011. *Leon Battista Alberti: On Painting: a New Translation and Critical Edition.* Edited by Rocco Sinisgalli. Translated by Rocco Sinisgalli. Cambridge University Press: 113.

four-dimensional thick land that we are penetrating by lines which are divided, multiplied, changed, and doesn't represent an established boundary in between.

Thick lines carry various meanings according to their context. In her book "Erimtan Museum: Signifying Traces" Aysen Savas discusses the thick line, with its various depths and meanings, from the line between a wall and the ground to the line that creates the historical city walls. The idea is to separate the container and the content while trying to blur the line that separates them. Historical city walls are carrying different layers that are formed by materials, things, spaces, techniques, ideas and memories, the mortar which holds the structures together. To unveil the "deep structure" of the remaining masonry walls of the historical buildings, a unique representation technique was developed.

Figure 3.15 line models, photographs from the museum opening in 2016 (Source: Aysen Savas, Erimtan Museum: Signifying Lines)

> *Employment of three-dimensional lines, or line models as they were labeled in the opening exhibition of the museum, enabled the thorough*

understanding and innovative interpretation of the constructional and representational characteristics of the historical walls.[72]

Investigating this representation technique with three dimensional lines discovers the potentials of how dualities exist that are defined by seen lines and reveals the unseen layers of them. These thick lines, as the line between ground and artifact or between different elements of the artifact can be physical as well as conceptual. Conceptual lines represent the forces of nature or the traces of history that forms and transforms the land form and built form. Each of these thick lines are scaleless, boundless, and formless that represents the essence of ground as four-dimensionality of the land.

Their correlation depends on various forces and acts that define the four-dimensionality. Tim Ingold, a British anthropologist, in his book "Lines: A Brief History" published in 2007, argues that line represents growth and movement.[73] To better situate the growth and movement on land; the obsolete line, that signifies threads and traces, will be correlated to built form and the surface to the existing condition of the land (land form).

As Alberti, Ingold puts forward threads and traces, which stand out among others, to represent the significant relationship between the lines and surfaces they are drawn. Traces are additive or reductive marks left in or on a solid surface by a continuous movement where threads are suspended between points in three-dimensional space and have surfaces instead of being drawn on surfaces.[74] The main point of this research starting from the dual relationships puts forth that this surface which is correlated to the land form is a four-dimensional thick surface and traces and threads execute the built form.

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[72] Aysen Savas. 2022. Erimtan Museum: Signifying Traces: 18.

[73] Tim Ingold. 2007. *Lines: A Brief History.* London, New York: Routledge.

[74] Tim Ingold. 2007. *Lines: A Brief History.* London, New York: Routledge.

Cynthia Davidson, in the opening essay of the book she edited “Tracing Eisenman” states that tracing is doubling, doubling back, going over to find a new truth, another history.[75] This doubling back to create a built form can be interpreted in many ways and each time it might change, however every time it constitutes itself based on the land form.

Traces and threads directed the work of many architects. Greg Lynn again in the book states that thinking of Derrida affected Eisenman and Tschumi and in consequence of that the term “traces” started to dominate Eisenman’s discourse and design technique. He states that signs are self-evident, clues are accidental, traces are provocative and can never be fully resolved.[76] This reflects the importance of “traces” on operative grounds. They should be provocative in order to trigger understanding new dimensions of the ground that are not visible. All Greg Lynn’s notion of fold, Bernard Tschumi’s notion of deconstruction and Peter Eisenman’s approaches to traces are not considered as a three-dimensional study that traces and threads the relationship between built form and the thick surface of land form. This provocative notion of traces will open up a debate on new dimensions and help to unfold the “demarcation line”.

3.2.1 Diptych as the Foundation of Dualities

Eisenman introduces the term ‘diptych’, both in his studio and practice, which for him is an investigation area of bringing two things together. Diptych is a relief carving or painting made of two parts, which are typically joined by hinges. They are hinged so that they can be closed like a book to protect the interior paintings.

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[75] Cynthia Davidson, ed. 2006. *Tracing Eisenman.* New York: Rizzoli. 25-31.

[76] Greg Lynn. 2006. "The Talented Mr. Tracer." In *Tracing Eisenman*, edited by Cynthia Davidson. New York: Rizzoli.177-195.

Diptych paintings has the relationships like it is in topology as two sides preserve their initial qualities and with the existence of hinge that brings them together their relation creates a third thing. According to Eisenman's idea the hinge is something other than the narrative space of the diptych, it is the conceptual thing that initially held it together and the hinge is an artifact which is always the other.

Figure 3.16 The Wilton Diptych, 1395-1399. (source: https://www.nationalgallery.org.uk/paintings/english-or-french-the-wilton-diptych)

Originally it is a Greek word 'diptukhos' that means 'folded in two', from di- 'twice' + ptukhē 'a fold'. The first diptychs are known as the ancient writing tablets consisting of two wooden pieces hinged together and waxed from the inside to be able to write on. The Wilton Diptych, shown in Figure 3.16 is an example of diptychs dating back to 1395-1399.

The format was first used in art and literature. Roni Feinstein[77], who curated the exhibition Contemporary Diptychs: Divided Visions in 1987 at the Whitney Museum of Modern Arts, states that in the Middle Ages the form was felt into disuse although some diptychs with religious themes appeared and in the fifteenth century it revived along with the triptych and polyptych format, for altarpieces. She also puts forward that, as soon as two images are brought together in diptych format, a dialectical situation is constituted involving suggestions of either/or, this/that, before/after and near/far.[78]

Topology considers the connection between objects to be more important than the objects themselves. This notion brings the understanding of the artificial and natural elements not being important separately. Instead, their co-existence, connection and continuity becomes crucial for architecture. Bringing up the terms as land form and built form is important for topology. By examining it with the layers of the landscape that acts as a hinge between the land form and built form, an augmented ground for architecture is suggested. If we see these correlations as a hinge, it becomes a joint, a gap or a concept relating land form and built form that break the dominance of these two components. Topology takes an important role in this sense, instead of only thinking about bringing two things together, various operations as modification and excavation becomes crucial.

[77] Roni Feinstein was the director of Whitney Museum of Modern arts for 7 years organizing exhibitions and supervising all museum functions. She curated the exhibition Contemporary Diptychs: Divided Visions between March 20-May 22, 1987.

[78] Feinstein, Roni. 1987. *Contemporary Diptychs: Divided visions.* New York: Whitney Museum of Modern Art: 2-3.

3.2.2 Dualities on Architecture

Dualities represent various perspectives to relationships which introduce hierarchies, oppositions, and contradictions. An important contribution to discuss the relationships is the term 'dialectic' which was a method of philosophical argument that involves some sort of contradictory process between opposing sides.[79] By dialogism, George Wilhelm Friedrich Hegel (1770-1831) who is a German philosopher lived in 19th century, argues on the contradictory process of opposing sides. In his philosophy it is seen in contrast to a dialogic process which relies on a contradiction between opposing sides, and it suggests a linear evolution of development. Hegel's discussion on unity is not by ignoring differences but by mediation of differences.[80] Unity of dualities is important for this research, but it varies according to the togetherness. By mediating differences, sides keep their own qualities but create a unity when they are together. Breaking or differentiating them does not change their individual qualities.

Mikhail Bakhtin (1895-1975), the Russian philosopher and linguist mostly known with his concern on "other-voicedness", in "Creation of a Prosaic", express it by stating that if you take a dialogue and remove the voices (the partitioning of voices), remove the intonations (emotional and individualizing ones), carve out abstract concepts and judgments from living words and responses, cram everything into one abstract consciousness - and that's how you get dialectic which lose all sense of the "human creativity".[81] In his published work "Problems of Dostoevsky's Poetics"

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[79] Maybee, Julie E. 2020. *Hegel's Dialectics.* Winter 2020. Edited by Edward N. Zalta. Metaphysics Research Lab, Stanford University.

[80] Georg Wilhelm Friedrich Hegel. 1967. *The Phenomenology of Mind.* Translated by James Black Baillie. New York: Harper&Row: 77-79.

[81] Gary Saul Morson, and Emerson Caryl. 1990. *Mikhail Bakhtin: Creation of a Prosaic.* California: Stanford University Press.

Bakhtin introduces the concept of dialogism by stating that a monologically understood world is an objectified world that corresponds to a single and unified authorial consciousness.[82] His discussion, different voices being more productive than a single voice, contains the interaction within times, users and discourses.

"The Dialogic Imagination: Four Essays by Mikhail Bakhtin" which was edited by Michael Holquist discusses dialogic process in contrast to a dialectic process. The first chapter "Epic and Novel" states that the whole of literature is an organic unity of the highest order, each is a unit, and all units are connected with a deep structure.[83] Understanding the break of this highest order and deep structure is crucial in the dialogic process since it is open to change and suggests more possibilities of relationships within itself and interrelated to the others and other times.

While comparing epic and novel the main difference is that epic is constituted by the past which is the world of "beginnings" and "peak times". The epic past is walled off from all subsequent times by an impenetrable boundary, it is absolute and complete, inaccessible to personal experience.

> *In general, the world of high literature in the classical era was a world projected into the past, on to the distanced plane of memory, but not into a real, relative past tied to the present by uninterrupted temporal transitions; it was projected rather into a valorized past of beginnings and peak times. This past is distanced, finished and closed like a circle.*[84]

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[82] Mikhail Bakhtin. 1984. *Problems of Dostoevsky's Poetics.* Edited by Caryl Emerson. Vol. 8. London: University of Minnesota Press: 6.

[83] Michael Holquist, ed. 1981. *The Dialogic Imagination Four Essays by M. M. Bakhtin.* Translated by Caryl Emerson and Michael Holquist. Austin: University of Texas Press: 4.

[84] Ibid. 19.

On the other hand, a novel is the opposite of epic, symptoms of change appear more often and characterize the novel as a developing genre. It allows other voices than the authors. While epics tend to be monologic, novels are dialogic by nature.

> *Every specific situation is historical. And the growth of literature is not merely development and change within the fixed boundaries of any given definition; the boundaries themselves are constantly changing. The shift of boundaries between various strata (including literature) in a culture is an extremely slow and complex process. Isolated border violations of any given specific definition are only symptomatic of this larger process, which occurs at a great depth.*[85]

To extend the speculations on the fixed boundaries Michail Bakhtin states that the interrelationship between time segments is important. When the present becomes the center of human orientation in time and in the world, time and world lose their completeness as a whole, as well as in each of their parts.[86] This interrelationship brings up the notion of change within different times that helps us better understand/interact with the moment we are penetrating. Even though it sees time in segments, it supports the idea of continuity between them.

Considering the dualities, the dialogic relationships of landscapes are important for reading and representing on operative grounds. If the nature is where human is not involved, has its own rules, it is somewhere that is not in dialogue with architecture. Considering nature as somewhere human interaction does not exist, it correlates with what Bakhtin calls as 'epic'. It's lack of interaction and 'human creativity' makes it monologic. Whereas landscape contains human interaction, it is open for other-voices, dialogues, and interrelationship within time segments. Separating nature -

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[85] Ibid. 33.

[86] Ibid. 30.

wilderness- from natural elements, landscapes represent the dialogic relationship of artificial and natural elements. Their interaction in nonhierarchical, interrelated and does evolve change together over time.

3.2.3 Breaking the Dualities

Hybrid as one of the dual relationships, is used in architecture in building concepts, production techniques and their representations and it was a key point in Venturi's work. In his book Complexity and Contradiction, he mentions,

> *I like elements which are hybrid rather than pure, compromising rather than straightforward, ambiguous rather than articulated, perverse as well as impersonal, boring as well as interesting, conventional rather than designed, accommodating rather than excluding, redundant rather than simple vestigial as well as innovating, inconsistent and equivocal rather than direct and clear. I am for messy vitality over obvious unity. I include the non sequitur and proclaim the duality.*[87]

Robert Venturi always uses the idea of hybrid in his work within different programs. As he states in his essay "A Bill-ding Board Involving Movies Relics and Space" their scheme for Franklin Delano Roosevelt Memorial is architecture and landscape. The fountain for Philadelphia Fairmount Park is architecture and sculpture where the approach was to contrast thereby enhancing the sculptural forms already existing in the neighborhood but not only to design another sculpture but also try to combine several things at once. Copley Plaza is architecture and urban design, and The National Football Foundation Hall of Fame is a building and a billboard; the duality

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[87] Robert Venturi. 1977. *Complexity and Contradiction in Architecture.* 2. New York: Museum of Modern Art: 160.

of each project comes from its context and its program. The idea is to enhance them by combining them with the design.[88] Which is to say in their case that the idea is to change the individual meanings of the components while bringing them together. This change creates hybrid conditions and prevents design to be neither architecture nor landscape, neither sculpture nor urban design.

Venturi proclaims that he prefers "both-and" to "either-or" black and white and sometimes gray to black or white. For him contradictory relationships express tension and give vitality as well as an architecture of complexity and contradiction has an obligation toward the whole and its truth is in its totality or in its implications of totality[89]. Tension in this case creates hybrid relationships where both sides lose their initial meaning and their boundary blurs.

Around the same year the Parc de la Villette competition (1982) had also a significance in terms of the discussion that are related to architecture and landscape. The high number of architect participants and submitted projects opened up new discussions that brought architectural culture and landscape closer for the contemporary city. Charles Waldheim states in his article "Landscape as Urbanism" that by La Villette landscape itself is conceived as a complex medium capable of articulating relations between urban infrastructure, public events, and indeterminate urban futures.[90]

Bernard Tschumi's winning proposal for Parc de la Villette supports the idea of urban organization being based on 'culture' instead of 'nature'[91]. The Park is a

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[88] Robert Venturi. 1968. "A Bill-ding Board Involving Movies, Relics and Space." *Architectural Forum:* 75.

[89] Ibid.

[90] Waldheim, Charles. 2006. "Landscape Urbanism." In *The Landscape Urbanism Reader*. New York: Princeton Architectural Press: 40.

[91] n.d. Accessed July 27, 2022. http://www.tschumi.com/projects/3/

discontinuous building overlapping existing features of the area and articulating new activities including workshops, gymnasium and bath facilities, playgrounds, exhibitions, games, competitions, and concerts.[92] The project was also a part of the exhibition "Deconstructivist Architecture" in 1988 curated by Philip Johnson and Mark Wigley at Museum of Modern Arts. In the book published on the exhibition they state that superimposition of points, lines and surfaces are the basic principle of the project. Different than their independent character, when superimposed they produce distortion, reinforcement, and indifference.[93]

The term deconstruction, that Jacques Derrida suggests discussing since 1971 has different definitions. It is always "on the move" as quoted from Derrida in the book "Deconstructions: a User's Guide" which was edited by Nicholas Royle. The book tries to put forward the relationship of deconstruction within different theories with a final text by Derrida. In his essay "What is Deconstruction" Royle puts forward the meanings of deconstruction from different dictionaries and mentions that Derrida persists that it transforms and multiplies the contexts in which it takes place. Quoting from Derrida that

> *This destabilization on the move in, if one could speak thus, 'things themselves'; but it is not negative. Destabilization is required for 'progress' as well. And the 'de-' of deconstruction signifies not the demolition of what is constructing itself, but rather what remains to be thought beyond the constructivist or destructionist scheme.*[94]

Following Kant and his ideas on "transcendental idealism" Derrida is interested in foundation conditions of experience. According to him the relationship of experience

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[92] Ibid.

[93] Philip Johnson. 1988. *Deconstructivist Architecture.* New York: The Museum of Modern Art: 92.

[94] Nicholas Royle, ed. 2000. *Deconstructions A User's Guide.* New York: Palgrave: 6.

and time is about repeatability and this minimal repeatability found in every experience is "the trace" which he also states as the experienced difference. The significance of traces for deconstruction is stated as *the logic of the 'non present remainder' with a much broader and more ghostly conception*.[95]

While these traces provide no difference within things and times, his critique of oppositions and hierarchies becomes important. He reverses the statements on one side being more valuable than the other. To better express his ideas, he invents the term *différance* to capture the double movement of a present both differing from and dividing itself, deferring itself, across time (Derrida, 1972a).[96] Derrida's indications on deconstruction and *différance* opens up a critical discussion on *in between,* however it is required to move from his theories to the theories that propose a more connected understanding of relationships.

3.2.4 Thick Grounds of Land Form and Built Form

Each of these theories mentioned, help us to better speculate on the dualities which demonstrate abstract theories on boundaries. Even though they help us to understand the roots of a more united approach this research has to be enhanced to formulate a more integrated relationship of land form and built form. To discuss it further it is crucial to look at the theories of relationships that have a more united approach without oppositions and hierarchies. This section of the study will benefit from the previous research however requires a to be completed.

Subsequent to these discussions, in his essay on "Architectural Curvilinearity" Greg Lynn offers examples of new approaches to design that move away from "logic of conflict and contradiction" to develop a "more fluid logic of connectivity." Departing

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[95] Ibid., 147.

[96] Ibid., 122.

from the Euclidean geometry of discrete volumes, this new fluidity of connectivity is manifested through folding and employs topological geometry of continuous curves and surfaces. Even though Greg Lynn's idea of fold helps us to uncover the forms of topological geometries and how they become a design strategy, they do not relate the built form with its context. While looking at the continuity of a floor to a wall and roof which blurs the definitions of each architectural element, their relationship with the land and atmosphere is not discussed. Furthermore, it cannot be approached by considering all the current and past features where memory of the landscape becomes an important factor.

In addition to the hybrid conditions of elements of architecture and landscape, a deep understanding of the land is provided by looking at its memory. The pace of change within physical conditions as well as social and symbolic meanings are different from each other. Warped time, warped space and meanings become important to understand and constitute the change of new relationships.

Anthony Vidler in his book "Warped Space: Art, Architecture, and Anxiety in Modern Culture" states the changing expressions and forms that describe the design processes as. types, signs, structures, and morphologies of rationalism was displaced by the cuts, rifts, faults, and negations associated with deconstruction which was replaced over the last decade by all words that have been employed to describe theoretical and design procedures such as folds, blobs, nets, skins, diagrams. This new vocabulary and its materializations intersect and extract many of their techniques from digital technology which many of the built and projected designs would be unrealizable without it.

Also, Vidler claims that this new vocabulary has something to do with contemporary interests in the informe which seems to trace its energies from a reading of Bataille, Deleuze and Guattari.

> *The representative forms of this by now strong tendency are complex and curved, smooth and intersecting, polished and translucent, thin, and diagrammatic. Both the new vocabulary and its materializations*

> *intersect with and take many of their techniques from digital technology; indeed, many of the projected and built designs would be unrealizable, if not unimaginable, without it. They are words and forms conceived and manipulated in a virtual space, with, nevertheless, an intimate relationship to production techniques and the technology of materials. Such a relationship would be impossible without the digital interface that construes information, theoretical and practical, according to the same rules of representation and replication.*[97]

In line with Vidler's ideas on this new vocabulary, topological continuity between aesthetic and physical conditions of ground is what comes forward. This new vocabulary breaks the hierarchies and oppositions, the continuity and connection between forms and concepts unfold the lines that constitute thick grounds.

3.3 Topological Co-Existence of Land Form and Built Form

> *For Kant, each term of the pair is inseparable from the other: subject and object, perception and reality, schema and senses. Otherwise, the world collapses into shapeless abstraction or a senseless kaleidoscopic scattering. It was the task of the twentieth century neo-Kantians, and it is our task as well, to topologize the field of the encounter of each of the pair of terms.*[98]

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[97] Anthony Vidler. 2000. *Warped Space: Art, Architecture and Anxiety in Modern Culture.* Cambridge, Massachusetts: The MIT Press: preface.

[98] Sanford Kwinter. 1998. "The Hammer and The Song." Edited by Like Bijlsma, et al. *Oase* (48): 31-43.

Stanford Kwinter in “the hammer and the song” introduces the diagram as the topologized schema. According to him they challenge the theory of perception and frees the established concepts of space. Topology here represents to unfold and cover the perpetual change.[99] Topology has been used within many disciplines to represent the unseen continuities, changes that are independent of the objects size and form.

Within the discourse of landscape architecture, Christophe Girot argues that landscape architecture needs a term like tectonics in architecture, which has helped to establish a theory of design and construction. In his research, topology is chosen for that term which suggests a sense of wholeness by referring to the physical and poetic reality of a landscape. The elegance of topology reflects the physical, aesthetic, and artistic aspects of the landscape with an understanding of its past. According to Girot, since topology relates to the genealogy of place, it is based on the meaning of a terrain; technically, culturally, and symbolically.[100]

He states that highly precise digital models inform us better about the physical interrelation of complex surfaces with forces and changes in the environment. It is not the quantity of data produced by a model that is relevant to topology, but rather the quality and precision of information that can be mined and retrieved from it. The “elegance of topology” could be best defined as the refined art of picking out the essential features of a site.[101]

To take Girot’s established idea further, looking at the complex structure of ground with its depths and history is important where land form and built form becomes forward in this research. “Topology means not only controlling a landscape, but also intuitively understanding its full potential. Adopting a topological approach to

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[99] Ibid.

[100] Christophe Girot. *Topology: Thinking about Ground in Landscape Architecture*. Zurich: Institute of Landscape Architecture, 2015.

[101] Ibid.

landscape may help us uncover and disclose the particularities and condition of a specific location with all its accumulated cultural and natural layers".

Here the interrelationship of different layers of landscapes brings the topological quality of the land instead of its elements. The combination of these different approaches should be investigated to better understand the full potential of "landscape". While doing that by Peter Eisenman's idea of "hinge" how the unity of two things is provided is important to investigate to apply it on the relationship of land form and built form.

In his essay "En Terror Firma: In Trails of Grotextes" Peter Eisenman states that the beautiful in Vitruvian sense as a dialectical category has been understood as a singular and monovalent condition, it has been about goodness, about the nature, the rational and truthful. Continuing by Kant's idea on beauty where he discusses that the sublime was within the beauty instead of being in dialectical opposition to beauty. His argument opens up a discussion on the difference between being in opposition and being within.[102] Eisenman discusses dualities in architecture through his practice and various readings, tracing a range from dialectic relationships to hinge in different forms. He is mentioning that there are many different twonesses in architecture; twoness of form and function, twoness of structure and ornament which are hierarchical categories meaning that they exist in opposition as independent conditions.[103] Therefore, indicates that, between these polarities a second displacing text is required to move. It will be present but not dominant and, in some way, according to him it can be called subliminal. When diptych relationships are considered; while bringing two different things together a third thing is produced which is the hinge.

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[102] Eisenman, Peter. 1989. "En Terror Firma: In Trails of Gro-textes." *Architectural Design* 41: 24.

[103] Ibid., 25-26.

Within the architectural theory, duality learned from Derrida has always been a matter of perceiving and designing the environment. As Eisenman mentions, the act of how two things are related to each other might not be a conscious act, but it exists anyway.[104] When the act is done consciously it becomes a design tool. A tool that breaks the hierarchies, regardless of being identical or not, two sides create a third thing that is neither one nor the other. Defining the binary relationships as hierarchical, he on the other hand proclaims a relationship where the two elements become one by addition of the third. His approach is to use it as a tool to understand the built environment and design by using it.

To better understand the artifact, nature, and landscape relationship in terms of land form and built form, an important resource to look at is Kenneth Frampton's book "Studies in Tectonic Culture" which was published in 1995. Here Frampton introduces a paradigm of essential pairing of architectural earthwork and framework, alternatively named topography and tectonics. David Leatherbarrow in his book review mentions "tectonics"--defined by Adolf Borbein in 1982 as "the art of joinings" but here considered more expansively as the interrelated arts of structure and construction-encompasses both cultural content and poetic meaning.[105]

While Gottfried Semper distinguishes the "elements of architecture" as the hearth, the platform/earthwork, the framework/roof and the enclosing membrane, Frampton reduces the elements into two: the topographical mass and tectonic frame.[106] Both approaches situate topography named as 'earthwork' as a platform that architecture must find a way to join in. Based on Bakhtin's dialogism that suggests an approach

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[104] Ibid., 24-27.

[105] Leatherbarrow, David. 1997. "Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture." *Journal of the Society of Architectural Historians:* 98.

[106] Ibid. 99.

between interrelated times and dualities defined by Kant, this separation is not necessary for the so-called emerging landscapes.

Landforms[107] are shaped and changed with natural impacts in various time frames. On the other hand, built form is associated with the man-made changes, artifacts on earth. However, this distinction requires a better definition to better discuss the changing ground of architecture. Considering the untouched nature as the ground zero of land, the formations either natural or artificial create spaces. To overcome the de facto debates on artefacts that are attached to the ground this research redefines or restates the meanings of land form and built form.

Land form takes shape or changes its shape with the natural forces that are as Immanuel Kant mentions subliminal, boundless, and formless. To better understand these forms unique geographical conditions that represent the "elegance of topology" comes forward. An example to the evolving land forms can be given as the revealing islands in the Arctic. In 2019 due to the melting of glaciers Russian army discovered five new islands in the remote Arctic. As well as the revealing of new islands, some islands were lost due to the sea level rise because of the melting of glaciers. While these changes affect the climate and cause shifts in natural sources, they also result in conflicts between countries. The debate on who owns these new revealed lands are a huge political debate.

Built form is the form that take shape with human contribution. Either with natural or artificial materials, indoors or outdoors every act planned, designed or measurable

[107] National Geographic defines landform as "a feature on the Earth's surface that is part of the terrain. Mountains, hills, plateaus, and plains are the four major types of landforms. Minor landforms include buttes, canyons, valleys, and basins. Tectonic plate movement under the Earth can create landforms by pushing up mountains and hills. Erosion by water and wind can wear down land and create landforms like valleys and canyons. Both processes happen over a long period of time, sometimes millions of years." (n.d. Accessed July 2022, 27. https://education.nationalgeographic.org/resource/landform.)

constitutes the built form. The meaning of the built form is mostly associated with the buildings and their relationship with the surrounding as streets, squares, etc. However, its definition stays short in terms of elements that constitute the built form. A garden is also a part of built form with its retaining walls, pavements, trees, or meadows. They express a four-dimensional form that are not static, they are alive, and changing in days, seasons, years.

3.4 Land Form and Built Form

To better formulate the land form and built form by looking at a geography is taking the research back to vertical and horizontal lines that are used to discover the thick grounds of Cappadocia. While the tectonic formations of Cappadocia can be defined as land form, the caves are considered as the built form. Volcanic and tectonic processes of Cappadocia Volcanic Province formed the landforms we see today, in over million years. Evolution of today's landscapes was also affected by the climate as well as the tectonic processes. Porosity of land is evidence that shows the three dimensionality of landform. Similarity of deep horizontal and vertical cuts expose the topological quality. The settlements of the city are carved out of these volcanic tuff landscape since it is a soft ground that gives possibility to easily transform. The underground cities, cliff cities and castles are the built form of the area. The topological dialogue of land form and built form recourses these formations and operations on the ground that constitute the landscapes.

In this research topology is used both to question the depths of land in terms of form and feeling as its essence. To discuss topology, it is necessary to pay attention to tectonics. Frampton discusses the term 'tectonic' as;

> *The dictionary definition of the term 'tectonic' to mean 'pertaining to building or construction in general; constructional, constructive used especially in reference to architecture and the kindred arts' is a little reductive to the extent that we intend not only the structural*

> *component in se but also the formal amplification of its presence in relation to the assembly of which it is a part. From its conscious emergence in the middle of the nineteenth century with the writings of Karl Bötticher and Gottfried Semper, the term not only indicates a structural and material probity but also a poetics of construction, as this may be practiced in architecture and the related arts.*[108]

By the readings of Christophe Girot, Greg Lynn, Anthony Vidler and Peter Eisenman this discussion of 'tectonic' is followed and enlarged with 'topology' that investigates the form and essence of ground and space. The space that is within the lines of ground as mentioned by underground cities or hidden features of the land that represent the depths of land form and built form is crucial for this investigation. Instead of only seeing the surfaces of their form, what they cover and what is within them is the main subject. There are many different layers under the Earth's surface with various forms and generated within changing paces and time segments. The most common examples can be given as the roots of the trees and underground infrastructure of the cities. In addition to them various horizontal networks as roads, pipes, roots, tunnels, rivers, and lands form the landscape infrastructure.

To discover the topological ground, it is important to look at the dualities such as above/belowground and inside/outside at the same time. Natural elements inspire the research as well as the artificially constructed grounds. Roots of the topological ground is twofold. Firstly, it is the literal meaning of roots of buildings as infrastructure and roots of plants. In both cases they are supporting and providing a system. Secondly it is the roots of disciplines as mentioned in previous chapter.

> *A knowledge of root distribution and root competition under different natural conditions is not only of much scientific value, but it also finds*

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[108] Kenneth Frampton. 2011. "Rappel a L'ordre, the Case for the Tectonic.": 21.

> *practical application in a better understanding of the value of plants as indicators for distinguishing lands of grazing value only from those with possibilities of crop production. It will result in a more intelligent solution of the ecological problems of grazing and will likewise be of great aid to the forester in selecting sites for afforestation. Moreover, a knowledge of root distribution will throw a flood of light upon many of. the problems of plant succession.* [109]

Professor of Plant Ecology in the University of Nebraska, J. E. Weaver (1884-1956) investigates the root systems of about 140 plant species and more than 1150 individual root systems of shrubs, grasses, and other herbs in his book 'The Ecological Relations of Roots' (1919). He studies the roots in relation to the soil types and climate of the region where these plants excavated. The book examines the roots with photos and illustrations of them. While looking at the roots singularly, he also discovers their network. By this research, while discovering the root habits he also discovers different layers of soil and prospers a deep reading of the ground. By revealing the hidden roots of plants to the ground. Weaver illustrates them and their relationship that possesses the deep ground and networks within it.

[109] John E Weaver. 1919. *The Ecological Relations of Roots.* Washington: Carnegie Institution of Washington: 1.

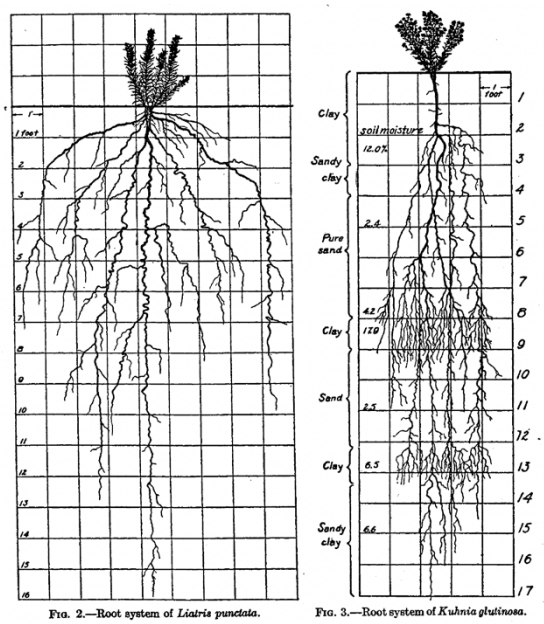


Fig. 2.—Root system of *Liatris punctata*.

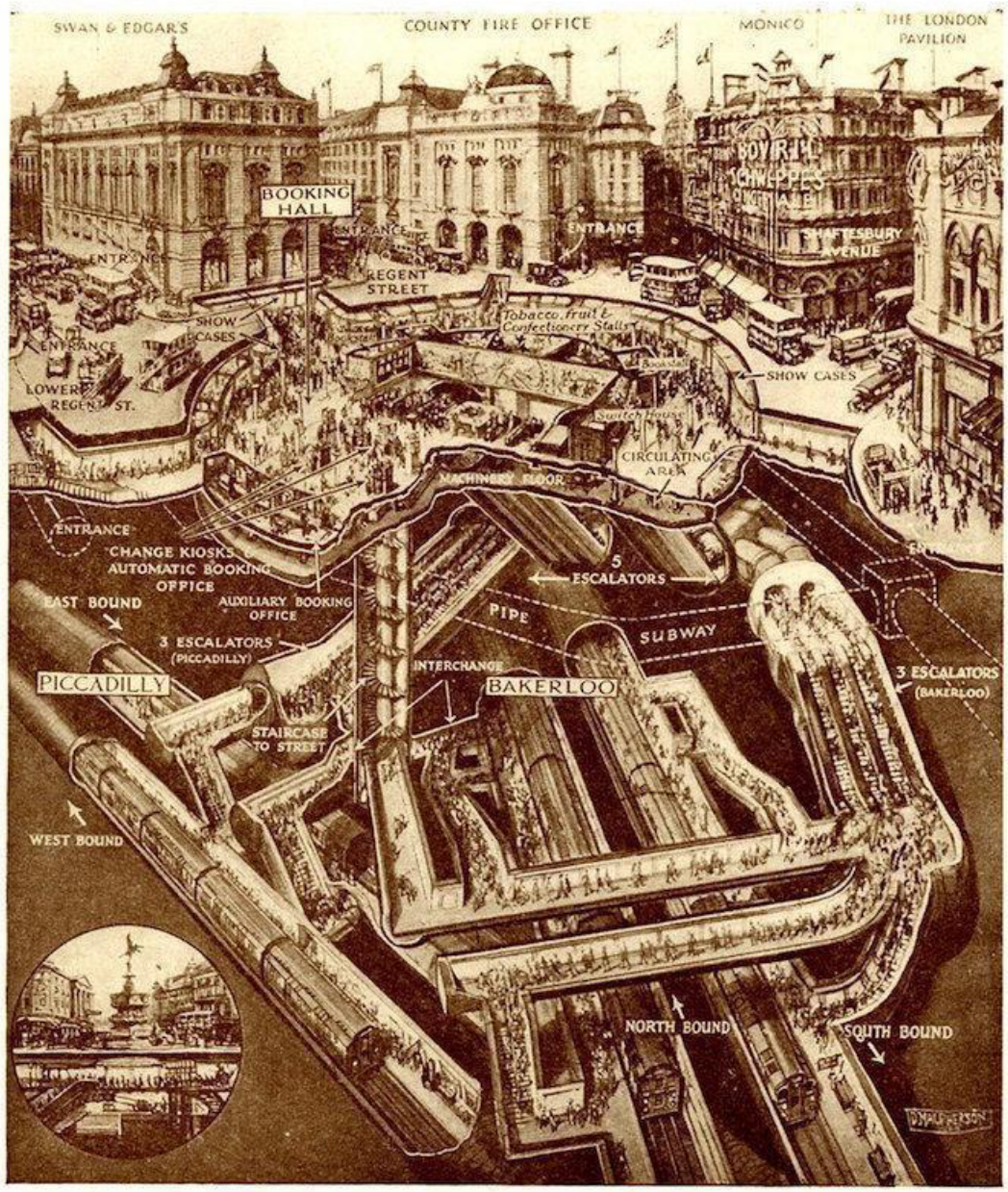
Fig. 3.—Root system of *Kuhnia glutinosa*.

Figure 3.17 J.E. Weaver and relations of the roots

A. *Panicum virgatum*, showing rhizomes, coarse roots, and complete single root.
B. *Stipa spartea*.

Figure 3.18 J. E. Weaver and relations of the roots

As well as the natural connections of roots, artificially built grounds are also topological. Either habitable or not; infrastructures, subways, underground cities, and foundations of buildings show the depths of ground. An example is given in Figure 3.19 where the topological ground depicted shows the sectional drawing of Piccadilly Circus Underground station. From surface to platform level, it cuts the topological nature of the building. The drawing represents the buildings on the north-west side of the circus, the underground station, connecting escalators and walkways, tunnels, and offices.



PICCADILLY CIRCUS TUBE STATION.

This station took four years to complete, and is designed to deal with over 50,000,000 passengers annually. There are eleven escalators that move at the rate of 100 feet a minute, some of which are reversible to deal with rush traffic. In the large circular booking hall, 15 feet below the ground level and covering an area of 15,000 square feet, are change kiosks, an automatic booking office, an auxiliary booking office, shops, and numerous show-cases in which the great stores can display their wares. The railway lines of the Piccadilly tube are 108 feet below ground level.

Figure 3.19 London's hidden tunnels. (source: https://londonist.com/london/transport/london-cutaways)

Christophe Girot's introduction of the term topology to the design field as `theoretical position and practical method of designing the contemporary landscape'[110] is what constructs the arguments on this part. This part weaves all the topics presented in the research and acts as a hinge. With the help of dualities, it is discovering different dimensions of the ground. Roots of plants, underground cities, subways, and infrastructures are the best examples to break the two dimensionality of the ground. To further discuss them shifts of time and space are discovered in the fourth chapter that are looking for the dimensions unseen and unpredictable.

[110] (A) Holistic observation and development of a place as opposed to for instance to engineering (where place results from technical functions); the orchestration of place whether directly or indirectly through the primacy of aesthetics; work on site specific relationships at all scales. (B) Mastering skills in landscape architecture through ground, water, climate, plants, and their dynamics through a deeper understanding of natural and cultural structures and established design traditions (symbolic, motivational, serendipitous, etc.). TOPOLOGICAL SPACE Elements ordered in space according to the necessity of their relationships, bringing together diffuse fragments and shaping them into meaningful, livable structures.

CHAPTER 4

LANDSCAPES WITHIN LINES: THICK LINES AND THICK GROUNDS

"The sublime moves us,
the beautiful charms us."

Immanuel Kant

As mentioned before the research suggests that for emerging landscapes it is crucial to look at the particularities and connections of topological grounds. This chapter aims to try to uncover these continuities by looking at the familiar architectural representation element: line. Throughout the architectural discourse line has been an important representation element for architects. This research does not differentiate the representation of a physical entity from the representation of a concept. While understanding the landscape via lines, the arguments states that, instead of only looking at the land's past and existing conditions, these vertical and horizontal lines should also give clues and project on its future.

Different suggested material and conceptual lines in landscape and architecture can be examined as guide line, coastline, timeline, skyline, borderline, property line, section line, etc. Each of these lines have different dynamic layers formally and conceptually. By briefly unpacking some of them and their potentials on ground, the aim is to find a way to read different portions of land form and built form and operate on them. After a wide reading of these lines, the study focuses on two distinct cultural geographies and their new grounds by tracing unseen and lost lines.

By moving from dualities to topology, to better read and represent these conditions different methods of investigations are observed. Initially, to break the hierarchies and oppositions that images suggest by representing only one condition of land, the

investigation continues with multiple images. These images contain photographs, drawings, writings, and aerial shots. With these multiple images the aim is to show the dynamic relationships that generate the conditions of land form and built form.

In the line of diptychs, triptychs and polyptychs are discovered for constructing a method of investigation and production. Moreover, new methods of metric drawings that are spanning the depths and heights of land both vertically and horizontally are introduced.

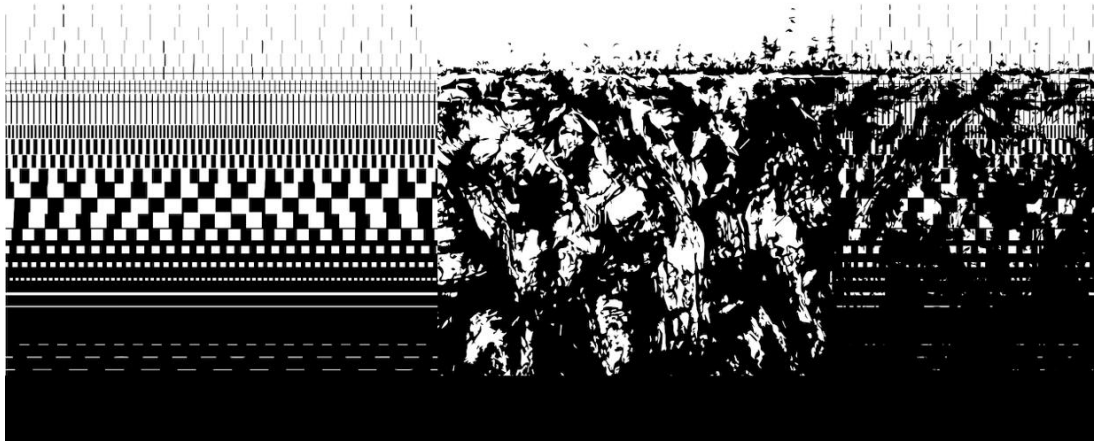


Figure 4.1 from lines to landscapes. Produced by the author.

4.1 From Diptych to Triptych and Polyptych

On the pattern of diptych, in mid 18th century tryptic are denoting a set of three writing tablets tied or hinged together.[111] Since then they are used in many different areas from writings to paintings. Gilles Deleuze, on his book “Francis Bacon the logic of sensation”, states that the triptych is one way of going beyond "easel" painting; “the three canvasses remain separated, but they are no longer isolated; and the frame or borders of a painting no longer refer to the limitative unity of each, but to the distributive unity of the three.”[112] Considering the dual relations, tryptic are not suggesting a duality, in their own way they are revealing or generating a continuity.

Figure 4.2 Francis Bacon, triptych, 1991. (Source: https://www.moma.org/collection/works/88170)

Figure 4.2 shows Bacon's final triptych which was made at the end of his career. It is a composite figure that steps in and out of stage like spaces. Closely cropped

[111] Oxford dictionary

[112] Gilles Deleuze. 1981. *Francis Bacon: The Logic of Sensation.* Translated by Daniel W. Smith. London, New York: Continuum: 85.

headshots of Bacon's face, at right, and, at left, that of a Brazilian racecar driver are seemingly nailed to the canvas. Christian religious painting is rooted in the triptych form; the center panel is often reserved for the object of devotion. From the black niche, a mass of flesh spills out. Bacon said his triptychs were "the thing I like doing most, and I think this may be related to the thought I've sometimes had of making a film. I like the juxtaposition of the images separated on three different canvases."[113] The color of the background creates the continuity of the tryptic, black frames provide the perspective that differentiates the three figures as well as bringing them together.

Deleuze also mentions that rather than a linear one, there is a circular organization in the triptych.[114] Following his statement, polyptychs are also important to discover since they propose different organizations. The Ghent Altarpiece also known as The Adoration of the Mystic Lamb, 1432, by Jan and Hubert van Eyck, shows the multidirectional nature of polyptychs with 12 panels that are joined with hinges. As well as the shapes and sizes of panels, how they are closed is also an important part of their statement and design.

Figure 4.3 The Ghent Altarpiece. (Source: https://en.wikipedia.org/wiki/Ghent_Altarpiece)

[113] n.d. Accessed July 27, 2022. https://www.moma.org/collection/works/88170.

[114] Deleuze. 72.

Engravings, paintings, sculptures, and writings are forms of diptych, tryptic and polyptych. How they are designed and joined together as hinged, tied, or folded is as crucial as their formation and statement. Therefore, this brings back the discussions on borders, boundaries, frame, and significantly line. As well as the panels, by recognizing the existence of these bonds and understanding the demarcation line that Kant suggests is also a part of the design that leads the operations on understanding and projecting on the ground.

The circular organization that Deleuze suggests appears as the cycles of different conditions of built form and land form where the cycle never closes or gets back to the same point, instead moving as a spiral. The construction of images via triptychs and polyptychs are omnidirectional and propose a nonlinear accumulation of lines to try to discover the essence of land.

“Thick” represents the depths of lines and grounds both metaphorically and physically. Thick lines and thick grounds are showing the circular and fertile nature of architecture itself. By unpacking skyline, coastline, and timeline the idea is to discover the changing and dynamic line that is both physical and conceptual. As well as the lines, topological, deep, and cultivated grounds represent the productive grounds that are thick and requires different perspectives to be seen and understood. This chapter is developed by the combination of photographs and drawings. They are all operative instead of representative, productive images instead of found ones.

4.2 Thick Lines

Unpacking timeline, coastline and skyline via tryptic images and examples from different geographies, examines their current static meanings. Firstly, timeline discusses the nonlinear formation of time and space within the accumulated layers of ground while mentioning the fluid continuity of past, present, and future. Coastline unfolds the hidden layers and multiple lines of water/land relationship horizontally and vertically. Lastly, skyline speculates on the existence of air and its

reflections on different levels of the ground and space. Changing horizons and silhouettes are the subject matter of this speculation.

4.2.1 Time | Line

> *Memories continually provide modifications to a sense of place which can never be exactly the same place twice, although there may be ideological attempts to provide 'stability' or perceptual and cognitive fixity to a place, to reproduce sets of dominant meanings, understandings, representations, and images.*[115]

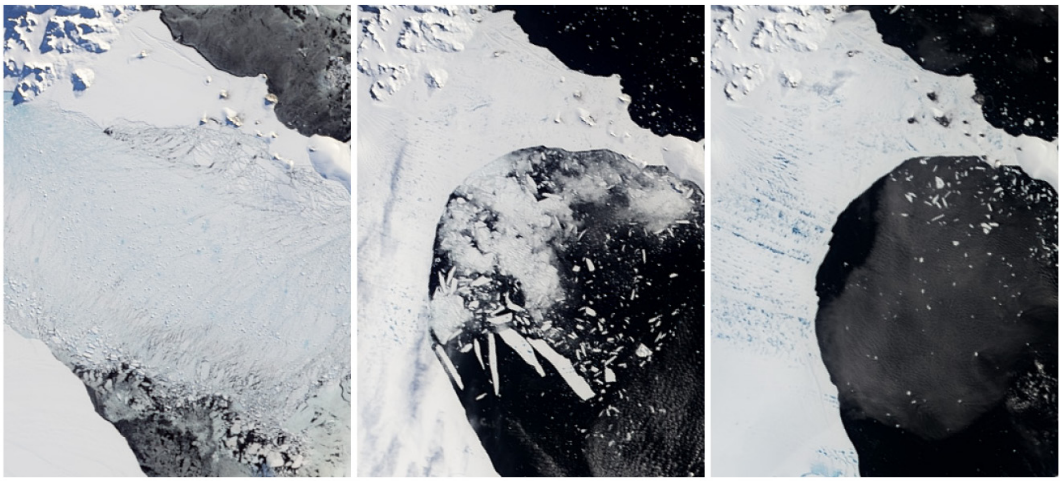


Figure 4.4 Melting of glaciers. Image retrieved from NASA and edited by the author.

Time for architecture and landscape architecture is an inseparable component both during the design phase and after. Its nature and subdivisions were always a question especially for designers and philosophers. In his book "The Culture of Time and Space", Stephen Kern discusses different modes of thinking and experiencing of time and space. In terms of time, he suggests considering it as past, present, and future,

[115] Christopher Tilley. 1994. *A Phenomenology of Lanscape Places Paths and Monuments.* Oxford/Providence, USA: Berg.

mentioning that even Bergson uses these terms where he insists on the division of the flux of time into three discrete parts distorting its essentially fluid nature.[116] While these terms seem like stating a linearity, Kern structures the book by juxtaposing different subjects that have their own fluidity in relation to their topics instead of a chronological order. His way of structuring the book and discussions opens a new way of formulating the time while subdividing it into common terms. This opens up the discussion on the three states of time to be correlated to land where their stance always changes according to considered space/material. Even though the construction of the timeline of land form and built form can be systematized by its past, present, and future conditions, it is a more complicated system that different elements of space have their duration, pace, and direction.

The book a "Thousand Years of Non-Linear History" by Manuel De Landa, discusses three words geological, biological and linguistics in a nonlinear way. He states these successive emergences will be treated as mere accumulations of different types of materials, accumulations in which each layer does not form a new world closed in on itself but, on the contrary, results in coexistence and interaction of different kinds.[117] Besides, for De Landa, each accumulated layer is animated from within by self-organizing processes with forces and constraints behind this spontaneous generation. Learning from geology these different accumulated layers of land form must be considered with different forces.

Geographical maps demonstrate a frozen time of the current situation without regarding accumulations, excavations or flows on the land form. In the book Cartographic Grounds, where different modes of representations on imaginary landscapes are depicted, the editors Jil Desimini, Mohsen Mostafavi and Charles

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[116] Stephen Kern. 1983. *The Culture of Time and Space 1880-1918.* London: Harvard University Press.

[117] Manuel De Landa. 2000. *A Thousand Years of Non-Linear History.* New York: Swerve.

Waldheim states that 'The trajectory of representation—of concept and context—has moved from the material and physical description of the ground toward the depiction of unseen and often immaterial fields, forces, and flows.'[118] These immaterial fields, forces and flows are main contributors of landscapes and they are what constructs the living environments and their pace of change. Also, as De Landa mentions the interaction and existence of these accumulated layers are interlaced. An intervention on ground doesn't always affect itself or its surrounding, instead its impact area is wider, both vertically and horizontally, than what it is shown in geographical maps.

Figure 4.5 Growth of Shanghai. Image retrieved from NASA and edited by the author.

According to the environmental crisis, interaction of artificial and natural elements, the pace of accumulations changes. As in Figure 4.4, the melting pace of a glacier is increasing relative to the development rate of cities, rising emission rates, etc. Instead of understanding time as a linear thread it is important to see its temporal depth, that many linear threads are interlaced. Different data should be integrated and

[118] Desimini, Jill, and Charles Waldheim. 2016. *Cartographic Grounds: Projecting the Landscape Imaginary.* New York: Princeton Architectural Press.

overlapped considering each accumulated material has their own timeline. James Corner's statement about the promise of landscape urbanism as the development of a space-time ecology treats all forces and agents working in the urban field and considers them as continuous networks of inter-relationships. [119]

Figure 4.5 shows the development of a city and the interrelationship of artefacts and natural elements. Different layers of networks are accumulated and have their own interaction. The space-time speculations that focus on these interactions and that tries to construct a well observed and balanced relationship enhance the ecological ground of architecture. These observations necessitate a deep and multifaceted investigation on current and past information of the land. Therefore, the future projections must always consider the interrelation of different layers and should design its own timeline.

Land is always changing with the interventions of natural and cultural forces. Land form investigates the spatiality of these changes whereas built form seeks to speculate on the projections on its future. The aim of designing the timeline is to orchestrate different continuities and connections.

Time | Antioch

Antioch, currently known as Antakya, has hosted many different civilizations since Antigonia, B.C. 307. Different cultural, spatial, and ecological aggregations created the city's current conditions. To better understand the genealogy of the city it is important to examine the topologies in terms of its archaeological, ecological, and anthropological traces.

The accumulated civilizations throughout history provide various cultural interactions. While nature has its own life cycle, its recreational, agricultural, and

[119] Corner, James. 2006. "Terra Fluxus." In *Landscape Urbanism Reader*, edited by Charles Waldheim. New York: Princeton Architectural Press.

ecological existence changes according to the daily life routines or rituals of the people. The idea of reflecting or projecting on these occurrences becomes crucial for the current and upcoming developments in the city.

A multilayered culture/nature relationship defines the spatiality of the city. These encounters and spaces of artifacts, natural elements with the effect of natural forces as earthquakes or changing civilizations contributed to today's physical conditions of the city. However, instead of respecting the particularities and essence of the land, today's conditions of the city are damaged and disrupted. The topological existence of the city is provided only if different cultural and natural elements are in a continuous interaction. Any kind of a rupture damages the essence of the land. As well as excavations and multiplications, these damages require operations of subtraction and simplification.

Elements of the landscape are dispersed above and below earth. They are the ruins, seeds, artifacts, bushes, trees, the Orontes River, etc. Besides approaching their singularity, connection, and continuity between them in terms of materiality and programs is what gives the atmosphere, essence of the land. To better investigate them a three-dimensional grid is used as a methodology in this research. This methodology is proposed as a way of seeing different depths and recognizing the essence of the land. The idea of cutting the ground with this grid is to reveal the hidden layers of the ground. Overlapping the maps that was found from different years and tracing the particularities and remains are the main idea. While doing those continuities and connections of urban programs within various time segments and current conditions of the city are discovered.

Figure 4.6 Antakya depth map. Produced by the author.

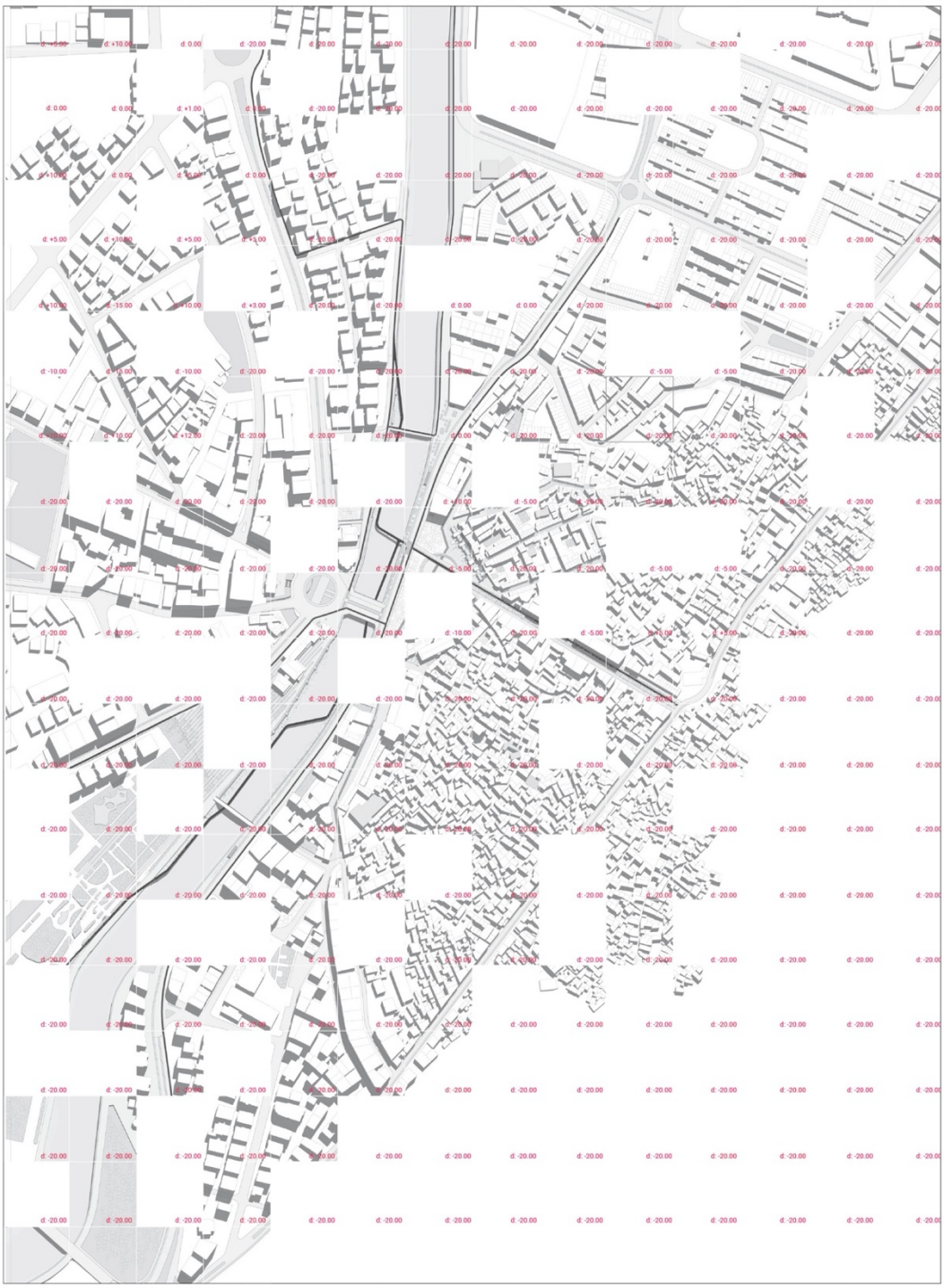

Figure 4.7 Antakya depth map. Produced by the author.

Figure 4.6 and 4.7 show the different depths of the region with vertical and horizontal cuts to investigate the geological and geographical data of the land. Maps of three different decades; 2021, 1936, 1880, root maps of trees, drawings of changing water level and water bed are embedded in the drawing. Each grid traces another hidden layer of the ground: some of them are the roots and foundations of the buildings, others are the former city walls and aqueducts. The embedded data of land form is processed topologically via these cuts and transferred into future scenarios.

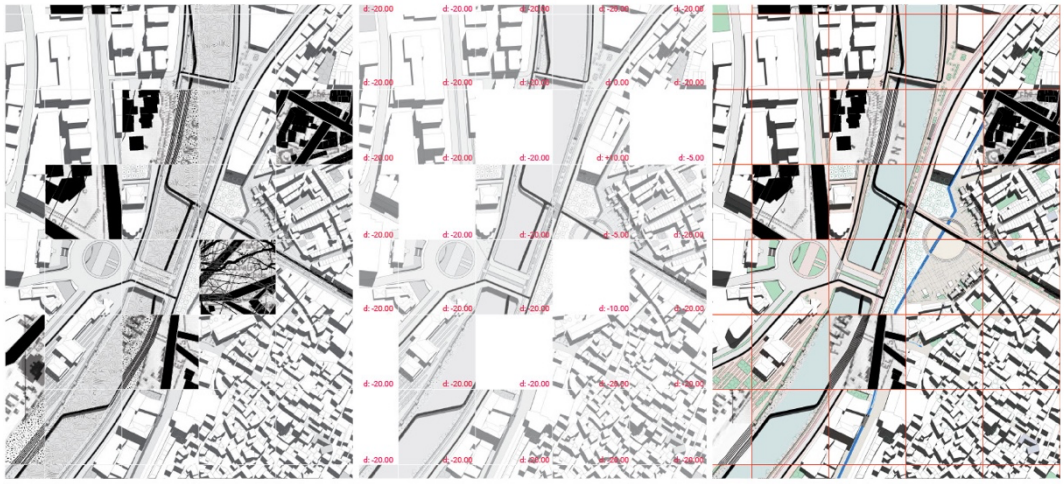

Figure 4.8 close ups. Produced by the author.

The close ups in Figure 4.8 shows the historical and new city center. Orontes River defines this different city centers. The west side of the river has been built around the beginning of Turkish Republic where the existing condition of east side has a history dating back to Ottoman Empire. However, under the ground of the historic city there are remains of natural and artificial elements of older towns, city walls and aqueducts. While the river acts as a separator within the current city, throughout years it's width, depth, character, and river bed has also change. These changes

shifted the flora and fauna in and around the river. The grid applied to the plans is considered as a two-dimensional grid that exceed the surface of the ground.

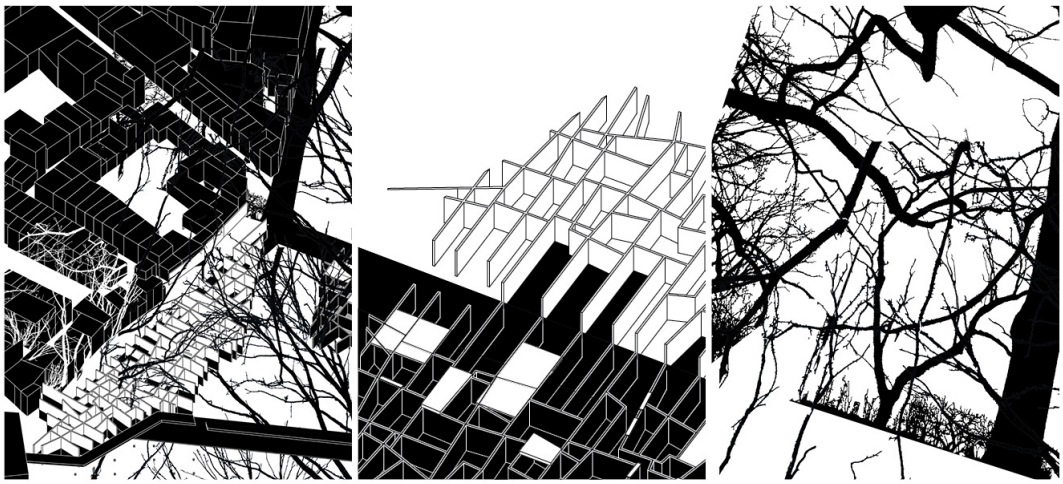

Figure 4.9 an abstract image of three dimensional grid and patterns that are composing the built forms of the city. It shows the topological structure of natural and artificial elements. Produced by the author.

Throughout years, the built form and land form of the city has changed. Within these changes land form of the city is defined via various natural forces in many decades. First of them can be examined as, the city has gone through earthquakes around the years 245, 526, 1901 and 1615. The debris after those earthquakes created the land form which was transformed to reestablish the built form of the city. Another important element that creates the land form is the Orontes River. Following the river, it changes its form according to topographies and users.

Some parts of the river are examined as built forms since they are tamed with human interaction. On the other hand, as mentioned, built form of the city covers the natural and artificial elements. The change on river bed, due to the needs of city, is an important act on the built form. The buildings, squares and street are affected by the river in terms of their structure and location.

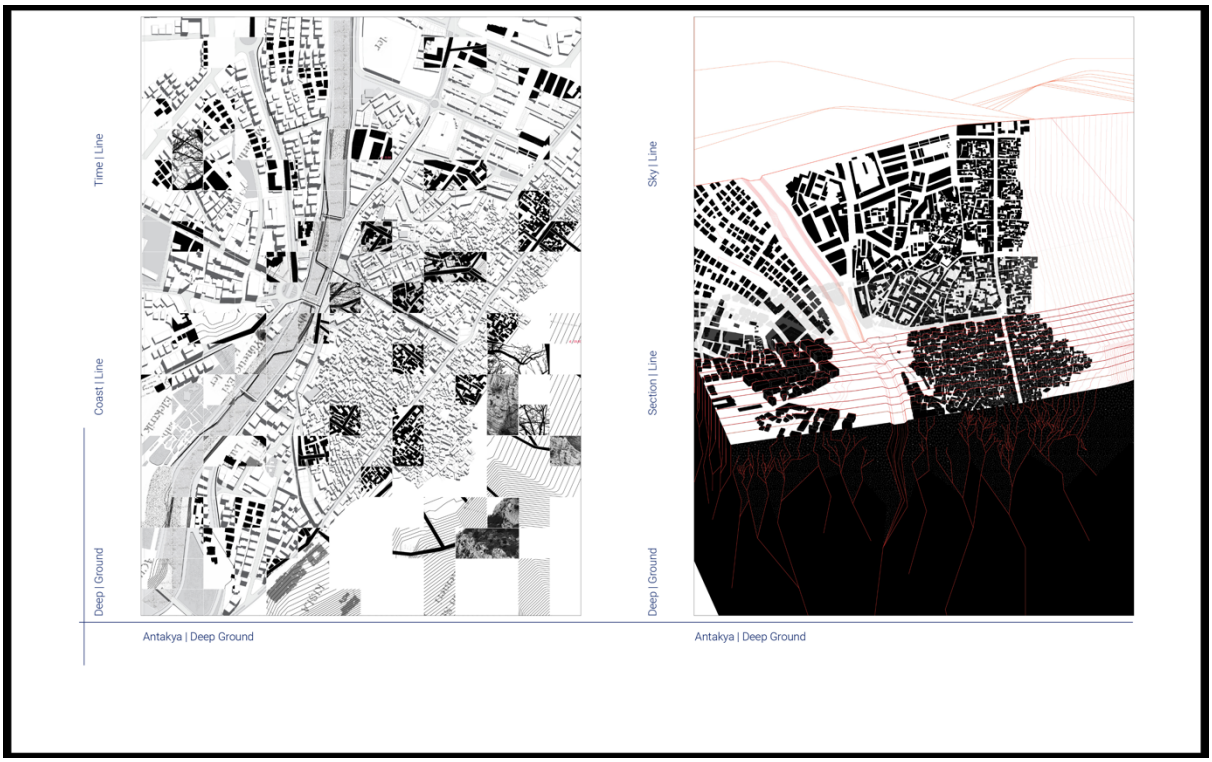

Figure 4.10 Produced by the author.

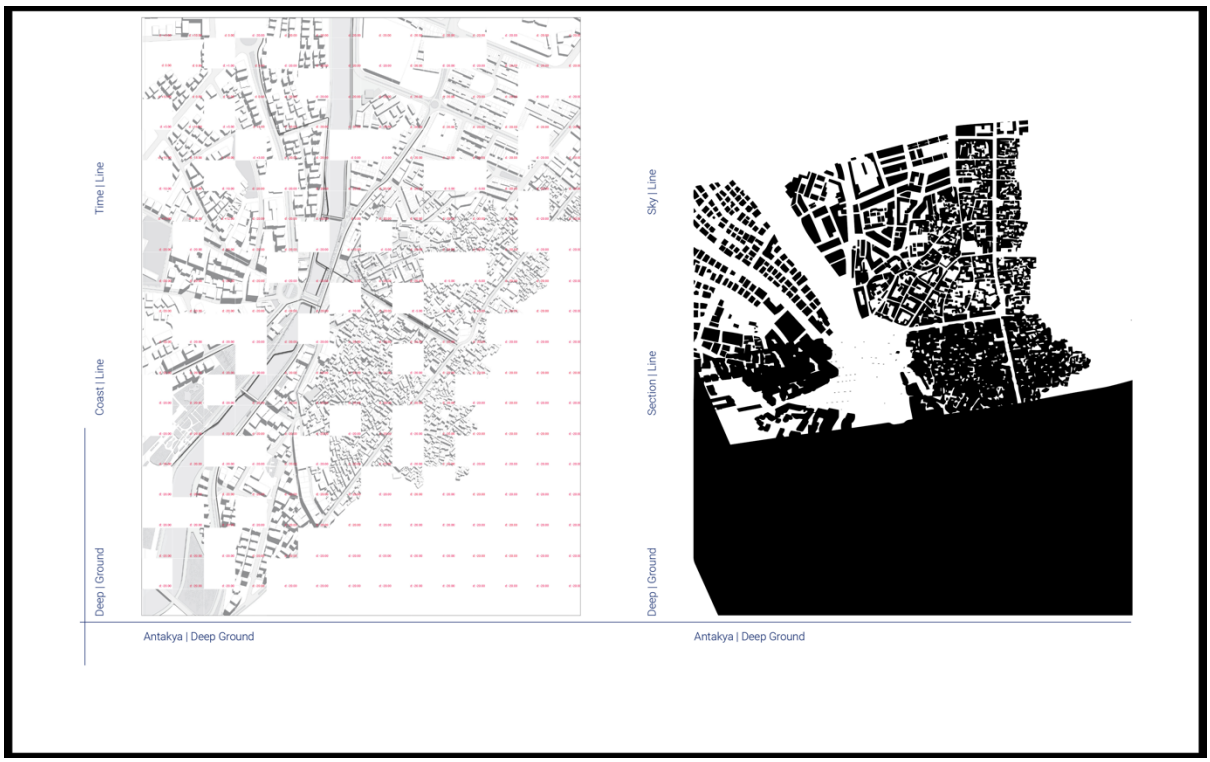

Figure 4.11 Produced by the author.

4.2.2 Coast | Line

Figure 4.12 Coast line. Photographs taken by the author.

As land is a multilayered thick formation where different time threads are interlaced, it is exposed to the forces of air and water. In this regard not only the land, but also the water is a part of land form and has an impact on the architectural ground.

The coastline has dynamic relations with both natural and cultural resources. Also, a great deal of aquatic and historical debris is found in the depths of water, which contributes to understanding the underlying processes. As mentioned before, what we see as a coastline is always in a state of change. It is both the change of the natural elements that constitutes the coast or their representation. To better understand and project on the architectural ground multiple lines are required that are reflecting the change of land form and pace of time.

Four-dimensionality of coastline should be discovered and enhanced where productive and living grounds are dominant. To define the complex land-water morphologies it is crucial to multiply the coastline and discover its particularities. The intertwined relationship of land and water breaks the line between them and becomes spatial. It represents in between environments of land and water ecosystems. In order to be able to unfold the hidden layers, multiplication of water/land relationship has to be unveiled via vertical and horizontal cuts.

A significant example to this situation in terms of land form can be given as the shipwrecks that exist under the water. They are either intentionally or unintentionally sunken or placed ships. They preserve historical information about life under or above water. Their existence provides a change in the fauna and flora of the area. While a coastline presents the water/land relationship it should also consider and reflect the spaces underneath. The pattern of this land form always changes according to the climate conditions, natural and artificial forces. The shipwrecks in Figure 4.13 are taken in Patagonia, where with the changes on sea level it is uncovered. While a ship is considered as built form, its form that is exposed to sea and various forces represents the land form.

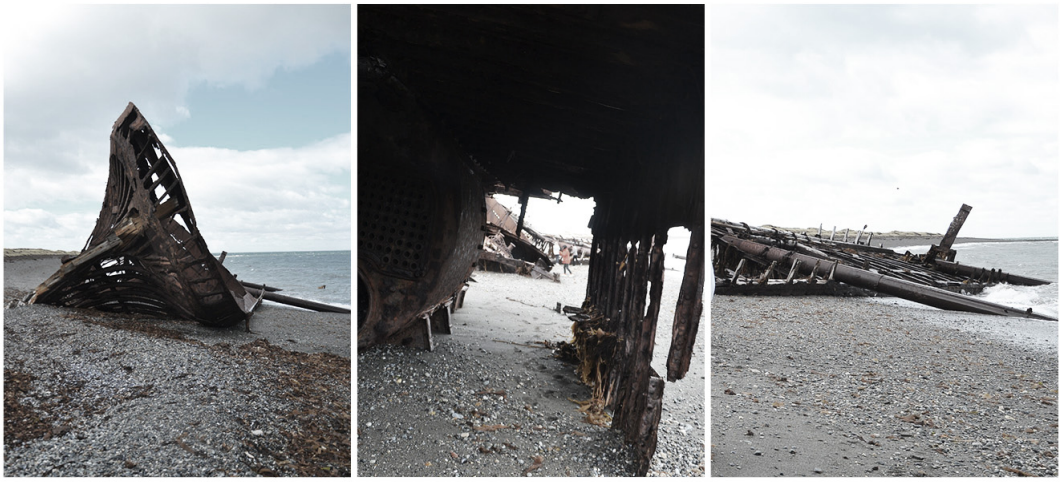

Figure 4.13 Shipwrecks from Patagonia. Photographs taken by the author.

Coast | Orontes River

Orontes River, also known as Asi River, is 571 km long starting from Lebanon and continues at Syria which is followed in Turkey and meets the Mediterranean Sea. Throughout the flow of river, it has hosted many civilizations -Greek, Hellenistic, Roman, Mesopotamian, Armenian, Byzantine, Arab, and Turkish- and battles for many centuries. Naturally and artificially the flow and context of the river has been changing according to cultures, events, and forces.

While as a thick line it is dividing the land with water, it also connects different countries, ecologies and acts as a cross border element. Focusing on the existence of Orontes River in Antioch, it divides the city into two and defines the old and new city morphology.

Land form of Orontes River is transformed by manmade structures throughout the line of water to establish settlements, provide food and energy for the habitat. Built form of the river which is constructed by the water wheels, the weirs, the aqueducts, and water sharing systems. They are the knots through the river that were built to cultivate the use of water. As well as the built structures, transformation of water bed is also a built form. Different governments and users control the water flow and water level to prevent floods, supply water for the villages and farms.

Following the river, traditional water infrastructures, known as Norias of Hama, carries the cultivated programs along the thick line. The **Norias of Hama** are a series of 17 norias along the Orontes River in the city of Hama, Syria. They are water-raising machines consisting of pots or buckets revolving round a wheel driven by the water current.[120] The water they carry are emptied into an aqueduct which used to carry the water to supply buildings, gardens, and farms.

[120] Oxford dictionary.

4.2.3 Sky | Line

> *Horizon: the furthest that you can see, where the sky seems to meet the land or the sea.*[121]

Figure 4.14 Skyline of vineyards. Photographs taken by the author.

Skyline is considered to be constituted by the land with all its features where the sky becomes the opposite of it. Oxford English Dictionary defines it as the outline of the buildings, trees, hills, etc. seen against the sky.[122] However, the sky has its visible/invisible deep forces within it that interact with the land. The wind, the sun, the air, etc., while affecting the visuality also affects the cultivation and motion that changes the skyline where it is impossible to detect a constant line.

Starting the discussion from medieval shapers of the land as farmers to the painters, Tim Ingold questions if the sky is a part of the landscape or not. While answering the questions on the tree, the ground, the weather, the river, and human movement, Ingold mentions the relationship of the ground and the weather as “The ground

[121] Oxford dictionary

[122] Oxford dictionary

surface is not pre-existent but undergoes continuous generation, within an unstable zone of interpenetration in which the substances of the earth mingle and bind with the medium of air… In its exposure of light, moisture, and currents of air —to sun, rain, and wind— the earth is forever bursting forth, not destroying the ground in consequence but creating it".[123] These blending reactions give clues on the topological nature of the land. Climate crisis, natural disasters are the reasons and outcomes of these reactions.

Figure 4.15 Skyline. Photographs taken by the author in New York City, 2021.

[123] Tim Ingold. 2014. "In Conversation with Tim Ingold." *Journal of Landscape Architecture* 50-53.

Sky represents the temporary and invisible layers of the land form. The tectonic differentiation of landscapes is therefore not possible. The effect of raindrops, sunlight or a wind is as important as hurricanes, floods, or earthquakes. While they are the natural inputs, their existence creates the blurred boundaries between different dualities: land/sky, land/water, artifact/nature of landscapes. While the buildings represent the built forms, they are exposed to the sky which in long term changes built forms to land forms.

4.3 Thick Grounds

This part is rendering the thick grounds and their transformations via illustrations and photographs. Topological changes on ground have ecological, anthropological, and archaeological layers that are woven into each other and evolve over time. It is possible to regard any piece of land and dig into it to understand the changes/formations happening. These transformations are frameless, scaleless, and timeless and the ground, as a four-dimensional thick entity, is porous and transmitting.

To unfold the topological layers of land the research focuses on the particularities and connections of line that represents the ground. In other words, considering the dual stance of space and ground, the line between them is blurred. This line constitutes the liminal formations that question fluctuating boundaries between the ground and architectural space. To do that, photographs and illustrations are used to render different horizons and examine particularities of thick grounds in this chapter.

The operative reading of ground via photographs is essential in order to understand its dynamic thickness that archives various forms and processes of formations, including archaeological, ecological, and anthropological layers. The essence of land form and built form is observed via drawings and photographs with its accumulated layers by operative reading and excavation to define living, thick, and four-dimensional environments.

Different modes of representation/reading of the ground provide a basis for this excavation. An important excavation environment throughout this research was the fourth-year design studio at METU. The studio constitutes a fertile laboratory for this investigation. To better understand and speculate on the thick ground, the studio argues on the idea of deep ground to exceed the surface-based design practice limits and to search for stratigraphic design acts. Questioning the liminality between the surficial and subterranean territories, mainly perceived as two autonomous environments, the research studio unveils depth as a source for landscape-based urban reading and programming. Unlike the familiarity of the surficial relations, obscured subterranean milieu activates the missing link for integrated urban strategies.

> *The ground's dynamic thickness that archives various forms and processes of tectonic, terrestrial, and aquatic assemblages, presents an alternative urban and landscape understanding. Shifting our attention from sealed engineered ground to deep ground, will also trigger design acts to deal with the planetary environmental challenges.* [124]

Following these strategies, the predefined forms and programs should be questioned for developing new landscapes. Acknowledging the variety of users is also as crucial as the land itself. Current landscapes are informed with various data that the preliminary user is always in a flux of change. Only human centered design approach is damaging the components of nature and its future. While the man-made grounds are considered as artificial, natural grounds are formed and transformed via forces and flows of nature. Mostly natural grounds are considered as large green

[124] An article "Projecting the Deep Ground" about the studio process will be published by Funda Bas Butuner, Aysen Savas, Nesli Naz Aksu and Sezin Sarica.

environments that are designed for recreational programs. However, the productive grounds are what augments the use of them.

Augmented architecture is examined in three different parts as: topological ground, deep ground, and cultivated ground. Each will render and question the current/future conditions and increased quality of lands from a different perspective. Discovering hidden spaces, forms and programs are leading the discussions in this part of the study.

4.3.1 Topological | Ground

Figure 4.16 Nature and architecture. Photographs taken by the author.

Archaeological, anthropological, and ecological topologies constitute the essence of land. Topology here contains human interaction with nature and memory. Tracing the movement and change on the land form and built form demonstrates the so-called interaction. In Figure 4.16, branches and steel structure are considered as built form. However, form of branches is deformed according to their interaction with the steel structure that is considered as land form. Their interaction, either minor or not, on how one affects the form of the other gives significant clues on the future of their growth. Different forces on their growth and change are showing the movement and directionality of two different yet interacting elements of that land. The immersive

branch and steel structure become joint after one point where one cultivates the changes on another.

These uncovered changes also occur under the earth where roots meet the foundations of a building or rocks, as well as seeds meet the sealed concrete ground or soil. This basic interaction is a simple form of natural and artificial co-existence. It is affected by aboveground and underground where sun and wind helps the steel structure and branches to interlace as well as the cultivated soil. Over the years the steel structure will be covered by the branches where form, architectural space and nature will be different.

> *Heidegger proposes a topological model for thinking about the relationship between people and the landscape as a matter of the 'thereness' of the self-disclosure of Being in and of the world. Cognition is not opposed to reality but is wholly given over in the total social fact of dwelling, serving to link place, praxis, cosmology, and nurture.*[125]

This topological model informs the existence of land form and built form where lines dissolve into each other within time. The co-existence of human and nature reveal coincidental outcomes that cannot be predicted. Heidegger's topological proposal for this relationship reflects on the ground where different occurrences represent the thickness. The changing and unpredictable interaction between natural and artificial elements breaks the lines of time line, coast line, sky line or section line that produce topological grounds.

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[125] Tilley, Christopher. 1994. *A Phenomenology of Lanscape Places Paths and Monuments.* Oxford/Providence, USA: Berg: 13.

4.3.2 Deep | Ground

Figure 4.17 Geomorphologies of Datça Peninsula. Photographs taken by the author.

Land has various natural formations that help to define the depth in terms of stratigraphical qualities. Stratigraphic cuts can be made both in horizontal and vertical directions. These repeated cuts help to decode the deep ground to study the formations, compositions, and layers within it.

In Figure 4.17, the triptych shows various formations from the coasts of Datça Peninsula, Turkey can be seen. The rock formations and different transitions in between geological textures helps to speculate on the processes and changes on the land. Each texture has its own story in relation to the wind, vegetation, sun, waves, their pace, and direction. Tracing the color and the texture of the land gives clues on the natural and architectural space within it while reflecting its future form.

Looking into the traces, formations, and existing geological data, it is almost impossible to detect a line that differentiate land/water, ground/underground. However, the lines that constitute the land help us to uncover the changes that the rocks have been exposed to. It is possible to exercise these formal translations as well as the spatial integrity within the thickness of the rock which helps to understand how to inhabit them.

Learning from the visible/invisible grounds and fragments, the accumulated grounds in Figure 4.17 shows natural and historical formations that are multiplied in different

decades. Discovering the architectural space within the ground creates new topographies that are productive, interrelated, and self-organizing. These deep sections illustrated in photographs show the continuities and connections in between.

During August 2021 various forest fires caused a dramatic ecological damage to the land in many different locations of Turkey. Within 6 days, in 1722 forest fires, 2.138 ha land was burned. Among others, the Datca peninsula was one of the most affected regions. Fires are almost impossible to prevent and hard to control since they are under the effect of natural forces such as high temperatures and strong winds. As well as the natural forces their speed of propagation depends on the character of the forest. While fires threaten the settlements, trees burn, oxygen levels decrease and maybe most importantly animals die. Recovering each of these damages are mainly possible however their speed of recovery depends on one another, and they have different paces. The fire damages the trees, their leaves, and branches but the root under the soil has potential to feed and recover them. Depending on the intensity of fire the recovery chance of the forest changes. After the low intensity fires the soil might become more fertile. However, for the animals it's harder to return.

Cities can be considered as the forests, if they have the strong and sufficient infrastructure, it is easier to recover. These infrastructures require operative grounds that are fertile, cultivated, and productive.

Deep | Cappadocia

A significant example on how land form and built form perpetually transforms into one another can be given from Cappadocia. By examining topological land formations architectural space is found/created within the ground where unique and specific cases are found. Thick land of Cappadocia is constituted with architectural spaces either formed by the accumulated layers of different civilizations or with the natural forces. Land form and built form of the region penetrates to each other and swap positions perpetually. Figure 4.18 shows the land forms and built forms of the area. The area is surrounded by mountains and rivers. The formations, either built forms or land forms, are unique in terms of how they emerge and operate.

This land form, unique with its rock formations leads to new methods of creating built forms. Instead of conventional construction methods, site and material specific solutions for underground cities and caves represent the distinctive atmospheres. By carving out and shaping the ground for many years people formed spaces for themselves and others that they are living together. This method of subtraction from the whole to create spaces gives the prominent quality of Cappadocia. As well as its form this ground is culturally fertile and prolific.

Figure 4.18 Land forms and built forms of Cappadocia. Photographs taken by the author.

Land forms of the area are the unique geomorphological features formed by volcanic and tectonic processes. Climatic influences affect the morphologies of the land with rock falls, erosional processes and cause the change within them. The constant interferences of nature (as air, wind, heat, rain, etc.) prevents a static land form. This peculiar morphology breaks the distinctions between landscape and architecture both formally and conceptually.

The valleys, canyons, villages are rivers form the subliminal atmospheres of the area. The soft volcanic rock is shaped by erosions which forms towers, cones, caves, and Cappadocia's famous chimneys. These formations by themselves are subject to intense research with their potentials to create unique atmospheres that is a consequence of natural forces.

Figure 4.19 Lines of Cappadocia caves. Photographs taken by the author.

Built forms of the land looks similar to land forms of the rock sites however the forces that forms them are different. Underground cities and cliff cities share the same operational logic. Their topological formation includes operations such as carving, reshaping, and excavation. Subtractive methods give form to indoor spaces that are unique in terms of their shape, climate, and program.

Non-clear-cut edges, skylights with amorph shapes, naturally formed window frames, carved out shelves are the unusual spaces with significant details. Underground cities with steep stairs, that are interconnecting various spaces are also significant. Each vertical cut through the area is dissimilar and represents a different space than the other.

4.3.3 Cultivated | Ground

> *Landscape is not given but made and remade; it is an inheritance that demands to be recovered, cultivated, and projected toward new ends.*[126]

Figure 4.20 Aerial view of productive landscapes. Photographs taken by the author.

Cultivated grounds are revealing the potentials of the land that is archaeologically, anthropologically, and ecologically thick with fragments of history, water, green, activities and agricultural lands. Relations of these fragments constitute the essence of land that is unique and cultivated in various perspectives. It signifies the productivity both culturally and naturally. Instead of only recreational areas, diversified programs such as cultural programs, sports venues, arboretums, gardens, etc. are crucial for future of both cities and rural areas.

Tim Ingold states that the landscape surface is supposed to present itself as a palimpsest for the inscription of cultural form. On the contrary he suggests that the

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[126] Corner, James. 2014. *The Landscape Imagination The Collected Essays of James Corner 1990-2010.* Edited by James Corner and Alison Bick Hirsch. New York: Princeton Architectural Press: 12

forms of the landscape – like the identities and capacities of its human inhabitants – are not imposed upon a material substrate but rather emerge as condensations or crystallizations of activity within a relational field.[127]

Figure 4.20 shows the aerial photographs of different lands from forests to agricultural areas. While agricultural areas are still very important, they are not the only ways how a land can be productive. Both rural and city has their own needs and potentials that are fertile in terms of cultural and natural reminiscences of lands. Neighborhoods dense with housings, industrial areas that are lack of social programs are the deficiencies of cities. Scarce variety of land use and demanding lifestyles which lead the society to consume is as threatening as ecological crisis around the world.

Figure 4.21 Oguzlar Dam. Photograph taken by the author, 2022.

[127] Tim Ingold. 2011. *Being Alive Essays on Movement, Knowledge and Descript*ion. London, New York: Routledge: 47

In rural, cultivated grounds vary from agricultural areas to dams. They all have different impacts on the city by providing energy, water, and food supplies as well as employment channels. Figure 4.21 shows the reservoir of a river dam that generate electricity by using water. Dams are used to store water, control flooding, and generate electricity. Constructed landscapes as dam projects have both positive and negative effects. While they provide energy, they do change the ecological balance of its environment with their huge built forms that gains their existence by cultivating lands with natural elements. By only coordinating the elements of nature they change the use of land and its benefits.

As mentioned, as well as the rural areas or suburbs, the cultivated ground in cities is very critical for architecture. In Chapter 2 it was mentioned that landscapes were used to heal the destroyed cities after WWII in Germany with agricultural and productive lands. Importance of changing the daily routines, and visual effects of war became forward. This is very critical to consider for most of the cities in Turkey. Unhealthy urbanization destroyed the productivity of cities. There are no enough green areas or facilities for public. As well as the green infrastructure, activities that are supporting the movement of people and social interactions, enhance the cultural and natural health of the living. Instead of only recreational areas that are filled with café and restaurants, cultural activities and sports facilities are very important for cities. Sports facilities, playgrounds, educational centers, etc improve the life quality of the dwellers in an area which triggers the productivity.

Cultivated | Argaeus

Argaeus, also known as Mount Erciyes, is one of the most important volcanic resources that cause the formations of Cappadocia. It is surrounding the region with Mount Hasan, Mount Melendiz and some other smaller volcanoes. They covered the land with tuff over the course of a twenty million years which lead to the erosion and revealed the rock formations of the region.

The cultivated ground of the area can be examined from 2 different perspectives. Both are mainly triggered by the land forms and followed by the built forms of the area. First one is the touristic significance that is advanced by the splendid formations of the land and spaces. Second one is the fertile soil and climate, that allows the agricultural production mainly with vineyards which also creates a culture.

This process affects much of the region in which the erosion creates deep and steep streams of the volcanic tuff and ignimbrite. The topography that is formed by this soft sand is dynamic and porous which creates stunning atmospheres and possible to mold. The soft structure of the ground gives possibility to carve that lead to the living complexes, underground cities, and monasteries. This unique fascinating atmosphere is very important for tourism around the area. As well as the morphological forms of the ground its soil quality is also very appropriate for production. Vineyards around the area supports the wine culture and tourism which is well known in Turkey and around the world.

4.4 Thick Lines and Thick Grounds

The examples on thick lines and thick grounds can be multiplied in different geographies with their unique features. The importance is to discover the invisible layers of them to be able to represent and understand the history and current conditions to project on their future. Thickening lines by multiplying and expanding according to the visible/invisible changing conditions is crucial to discover operative thick grounds. Thick grounds lead the discussions on architecture, their depth reveals the particularities of their formations. By thickening them the lines get lost and new grounds are discovered.

New methods of reading and reflecting on these grounds is necessary for the emerging landscapes. The research on these new methods to reveal the particularities of the ground requires a distinctive investigation. There are various methods starting from Alexander Von Humboldt’s sectional drawings to Christophe Girot’s

topological point cloud models. Each gives a significant perspective to understand the land and uses different technologies. Texts, illustrations, photographs, sections, plans and axonometric drawings by using lines provide the basis on operative grounds. This curated data set represent observations and working ground of the architect. The interconnectivity of four dimensions of ground is embedded in them.

Christophe Girot's point of employing topology and precision to landscape architecture stands out. Point cloud modelling is the tool for him to achieve precision which he argues broadens the territory of the field. For him topology is to bring landscape architects to a common ground. To understand the genealogy of a place, point cloud models are the tools and he further develops his idea stating that they are also to operate on those landscapes.

Girot compares topology to palimpsest, stating that "the palimpsest involves a synthesis of layers, traces, and erasures compressed on the surface of a plan, which are meant to be understood as a two-dimensional representation of different times on the surface of the earth, whereas topology, through a 3D physical model, directly represents the embodiment of landscape in a much fuller synchronic dimension."[128] Learning from Alexander Von Humbolt's sections and considering the ideas and methods of Christophe Girot the potential of lost lines and new grounds are suggested to be discovered.

[128] Christophe Girot. 2013. *The Elegance of Topology*. Vol. 3, in *Topology: Topical Thoughts on the Contemporary Landscape*, 79-115. Berlin: Jovis.

CHAPTER 5

LOST LINES AND NEW GROUNDS

Architecture had different grounds in relation to the land form that it is based on. It was conceptually and materially detached, sunken, carved out, attached, or added to the ground. It sometimes learned from it; others set a distance. Among all these, with the changing discourses, accumulated knowledge and evolving technology, architecture has lost its ground. Meanwhile, what is always constant is land forms and built forms, they do not differentiate natural and artificial elements. Their four dimensionality is informed with time and forces. Regardless from how they change, new grounds are the continuities of these transformations.

Land forms represents the topological nature of landscapes. While emerging from the ground, they dissolve in it as well. Built forms are formed with natural and artificial elements and evolve/change over time. Gardens have always been a part of them, either detached, attached, or included to the artefact. It's retaining walls, pavements, trees, or meadows becomes architecture and express the four-dimensional form that are not static, alive, and changing in days, seasons, years. Cultivated, topological, and deep grounds in different geographies and of different scales represent the new ground of architecture. Within these grounds architecture and landscape architecture is evolving, living, and operating together.

To examine and project on the natural and artificial forces of these new grounds line becomes very crucial. The lines that are considered as skyline, coastline, timeline, fault line, guide line as well as lines between ground and building, wall, and roof, between walls, columns and beams replaced themselves with topological surfaces. The word topology states the 'study of place' regarding the roots of the Greek word. This brings the topological studies to examine traces and threads of genealogy of place; technically, culturally, and symbolically. While lines are used to read,

understand, and project on the ground they are always in a state of change. There are more invisible lines to understand the formations of land form and built form. Considering the lost lines that are both visible and invisible to understand and represent the topological new grounds is architecture's new augmented field.

Starting from the definitions of Vitruvius, architect is a multidisciplinary person who has to know a little about a lot, has to be able to talk to everyone and adjust his thoughts according to him or her. Architecture is what is formed when you mix, history, geometry, philosophy, and it is whatever it is when you intersect all those forms of knowledge. Since those centuries, the disciplinary bonds and borders, different knowledges became the focus of architecture. These changing interactions define the current atmospheres that we live and lead the discussions around the world.

Considering the current tendencies of the design world, interdisciplinary and transdisciplinary approaches in architecture has always been a burning topic. Even the relationship of artifact and its surrounding has always been discussed, landscape with its concerns started to become more and more important. However, the use of them is in a risky state since the words sustainability, ecology, becomes forward without a deep understanding on them or since they don't fulfill the needs. This tendency to misinterpretation requires a clearance and a statement for the future of the discipline. In light of the discussions, augmented ground of architecture has to cover and provide a new ground that knows about everything.

The definition of landscape is vague in the discipline of architecture since it covers a wide array of topics. Landscape has become a concept or a form for many architectural projects in last decades. Conceptually it was used as open spaces of the buildings, ecologies of the environment or highlighting a single element of landscape such as trees, water, etc. Formally buildings that take shape and reference from the landscapes or from the systems of landscapes came forward. However, landscape for architecture is not a concept to define the artifacts. It must be considered as the ground in harmony with the artifact.

During the time of increasing ecological and cultural crisis, shifting paradigms, by tracing the depths of the discipline, this thesis develops a new ground for architecture by considering landscape as the augmented ground of it. The aim is, instead of adding other disciplines partially to the theory of architecture, shaking the current entrenched norms of it. The pace of this change has to be determined by the institutions. Formulations of new academic programs is proposed as the dominant initiator that will trigger the change in various atmospheres.

While theories should lead the discussions, research in practical environments must be following them meticulously. Their separation will restrain the proposed new approaches. The research lab of architecture in academy is studios and after that it is the offices. Applied works and theories has to be complementing each other. As well as the topological dialogue of various terms suggested in this research, their topological dialogue is also very crucial.

The ground as a four-dimensional thick surface that is saturated with various natural and artificial elements and its topological properties is the subject matter of architecture. New methods of reading and projecting the ground that reflect the architect's perspective and particularities of the ground is necessary to develop topological approaches. This will take the lead in questioning rapidly changing environments and responding them with required responsibility. New architectural programs that find its ground in landscape programs should be developed and proposed to better discuss the current atmospheres.

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