

BUNKER-SCAPE: DEFENSE ARCHITECTURE IN GALLIPOLI PENINSULA

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF ARCHITECTURE
IN
ARCHITECTURE

SEPTEMBER 2019

Approval of the thesis:

**BUNKER-SCAPE: DEFENSE ARCHITECTURE IN GALLIPOLI
PENINSULA**

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ABSTRACT

BUNKER-SCAPE: DEFENSE ARCHITECTURE IN GALLIPOLI PENINSULA

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September 2019, 88 pages

Bunkers have been fascinating for architects and theorists since their first construction in WWII. Considering their extensive deployment in various geographies, architecture of the bunkers marks a point in the history of military space. In the beginning of 21st century, there have been several constructions of walls around *frontier* geographies. In order to understand this recent activity, it is necessary to unfold the processes that actualizes the walls as the territorial control mechanism. The former theoretical studies about the bunkers are mainly consisted of analogies and descriptions. The aim of this study is to regenerate the relations between the past and the present techniques of defense architecture by taking the architecture of the bunkers at its focus, with a more contemporary approach. This study acknowledges the bunkers as an “image” of frontier architecture. The frame of this image stretches between the forces, movements and fluxes of its territory, and the modes of architectural productions that create them. Being a strategically important piece of land for ages, the Gallipoli peninsula provides a wide collection of defense architecture. Throughout the study, the image of the territory focuses on the isthmus of Bolayır where both historical recordings of the walls and the practice of bunker architecture are readily available. With the surveys

and the documentations, architectural image of bunkers points out a perpetual change in functions and forms of the defense architecture.

Keywords: Territorial Image, Architectural Image, Military Space, Bunker Architecture

ÖZ

KORUGAN-PEYZAJ: GELIBOLU YARIMADASINDAKİ SAVUNMA MIMARISI

Arıkboğa, Caner
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Ortak Tez Danışmanı: Dr. Öğr. Üyesi Pelin Yoncacı Arslan

Eylül 2019, 88 sayfa

Koruganlar, 2. Dünya Savaşı'ndaki ilk inşaatlarından bu yana mimarları ve teorisyenleri etkilemektedir. Bunların geniş coğrafyalarda yaygın bir şekilde ele alındığı göz önüne alındığında, korugan mimarisi askeri alan tarihinde önemli bir noktaya işaret etmektedir. 21. yüzyılın başlarında, sınır coğrafyalarının etrafında duvar inşaatları kendini tekrarlamaya başlamıştır. Bu yakın zamandaki faaliyeti anlamak için, duvarları bölgesel kontrol mekanizması olarak gerçekleştiren süreçleri ortaya çıkarmak gerekmektedir. Koruganlarla ilgili daha önce yapılan teorik çalışmalar, çoğunlukla analogiler ve açıklamalardan oluşmaktadır. Bu çalışmanın amacı, korugan mimarisini odağına alarak daha çağdaş bir yaklaşımla geçmiş ve şimdiki savunma mimarisi teknikleri arasındaki ilişkileri yeniden canlandırmaktır. Bu çalışma, koruganları sınır mimarisinin “imgesi” olarak kabul etmektedir. Bu görüntünün çerçevesi, bölgesinin kuvvetleri, hareketleri ve akıları ile onları yaratan mimari yapımlar arasında çizilmiştir. Stratejik açıdan önemli bir toprak parçası olan Gelibolu Yarımadası, geniş bir savunma mimarisi koleksiyonu sunmaktadır. Çalışma boyunca, bölgenin görüntüsü, hem duvarların tarihi kayıtlarının hem de sığınak mimarisi uygulamalarının bulunduğu Bolayır berzahına odaklanmaktadır. Arazi gezileri ve dökümantasyonlar ile düşünülünce, koruganların mimari imgesi

savunma mimarisinin fonksiyonlarında ve formlarında kalıcı bir deęiřime iřaret ediyor.

Anahtar Kelimeler: Bölgesel İmge, Mimari İmge, Askeri Mekan, Korugan Mimarisi

To Luigi and Haku, the cats

ACKNOWLEDGEMENTS

First and foremost, I owe my deepest gratitude to Assist. Prof. Dr. Pelin Yoncacı as a mentor and an advisor for her guidance, exciting suggestions and solid contributions throughout this study. If it was not her encouragements and motivations, this study would not reach to the state it is now. It will always be a pleasure to know her envisioning approach since the course “Digital Humanities Lab”.

I am grateful to Assoc. Prof. Dr. İpek Gürsel Dino for taking this study under her supporting criticality and feedback. Feeling her trust, starting from the undergraduate years till today, is greatly valuable.

I would also like to thank to my jury members Prof. Dr. Güven Arif Sargın, Prof Dr. Namık Günay Erkal, Assit. Prof. Dr. Esin Kömez for their valuable critics and inspiring comments.

Having another family formed inside and outside the faculty was something to hold on to. I thank to Güneş Duyul, Dicle Kumaraslan, Sinan Cem Kızıl, Sonat Özcivanoğlu, Pınar Yazdıç, Tuna Bozankaya, Kadir Akar, Pınar Yalçınkaya, Eylül Şenses, Alican Sungur, Seyithan Özer, Oğulcan Aksoy Merve Çolak, Cem Dedekargınoğlu, Osman Sümer, and Mustafacan Kutsal for being by my side. Without them, life in Ankara would be unbearable.

It is also great to have new fellowships throughout this study. Thanks to Eyüp, Sezin, Bengisu, Nesrin, Eren, Deniz, Zeynep, Lami, Ensar, Neris, Ozan, Selen, Fırat, Müge and the all the blackhole crew for backing up.

Last but not least, I could not move any further without İrem Ceren, Gülay and Cevdet Arıkboğa, who have been the greatest teachers for me. I cannot imagine a life without their support and understanding. They are my felicity.

Finally, losing two friends along the way was the hardest part of this journey. I would like to commemorate this study to the brothers, Luigi and Haku. I will always miss you guys.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

B1: Bunker Type 1

B2: Bunker Type 2

B3: Bunker Type 3

B4: Bunker Type 4

B5: Bunker Type 5

B6: Bunker Type 6

B7: Bunker Type 7

B8: Bunker Type 8

B9: Bunker Type 9

Lt: Latitude

Ln: Longitude

A: Altitude

T: Type

CHAPTER 1

INTRODUCTION

The military institution has a history of affecting the formation of the city during the establishment of the “war machine”.¹ After the 19th century, the outbursting of city functions over the city the walls necessitated a new defense mechanism.² Wim Nijenhuis highlights the importance of the defensive architecture in the control of the cities.³ The investigation of the link between the architecture of defense structures and mechanisms of control can reveal the hints of an articulation. Precisely, the articulation which is composed of management of optics, logistics, and sources in a war zone needs to be distinguished in order to create the image of the territory and architecture together. The following study aims to create series of images by examining a “war-broken site”, Gallipoli peninsula.⁴

Gallipoli has carried its strategical eminence up to this day, particularly, due to its position being on the intersection of oversea transportation between the Aegean Sea and the Black Sea and overland transportation between Europe and Asia. (Figure 1.1.) Gallipoli has become a militarized land with small cities attached to Dardanelles. Settlements around Dardanelles are mostly surrounded by military camps, as well as the peninsula hosts several historical remains of battles and defense architecture. The

¹ The Deleuzean term, “war machine”, was stressed in Nijenhuis’s studies. He embarks upon articulations that are derived from the relation between “machines” and “mechanics”.

Wim Nijenhuis, *The Riddle of the Real City*, (1001 Publishers, 2017), 280

² Ibid.

³ Ibid.

⁴ Ahenk Yılmaz, “Memorialization as The Art of Memory A Method To Analyse Memorials”, *METU JFA*, 2010

locations and accumulations in “total defense”⁵ strategy are drawn-out in the south-north axis, which is a line that stresses the *traffic*.

It is significant to understand how the forces of political distress can shape the form of the strategy. In addition, late 19th and early 20th century forts were located in accordance to the factors of tenability. Likely, the mid-20th-century fortifications were parts of a defense strategy that would counter the urgent attack. Especially the change of 20th-century defense architecture is traceable, in terms of the diverse fortification typology on the site.

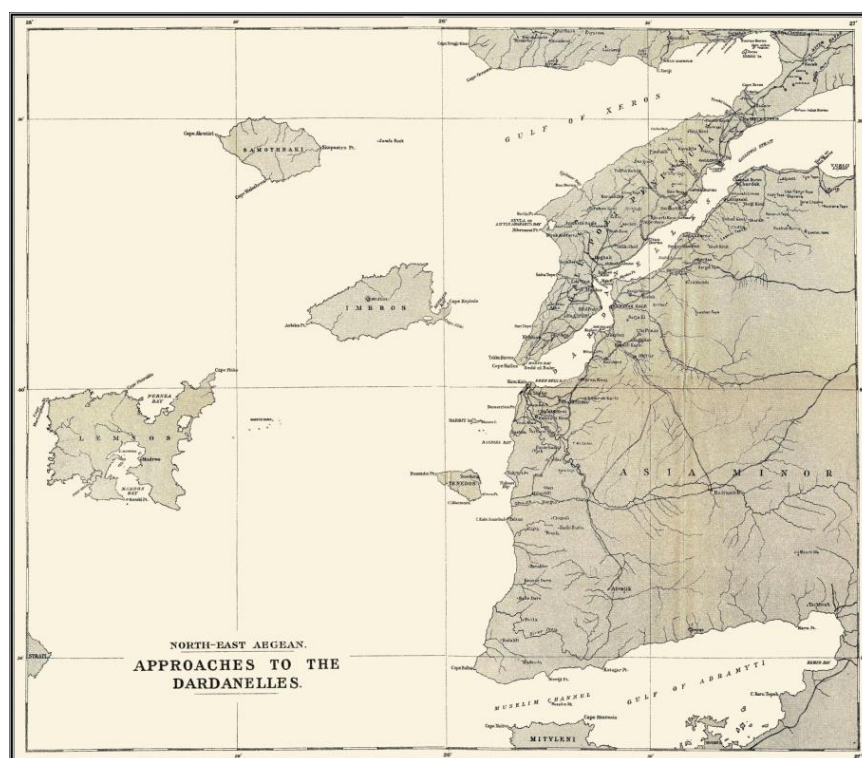


Figure 1.1 Dardanelles and Gallipoli Campaigns (2018) Retrieved from (<http://www.naval-history.net/WW1Battle1503Dardanelles1.htm>)

⁵ Total defense is a term that signifies the motives of a country that exerts the defensive strategies on social, economic, digital, psychological, military and civil levels. The usage of the term, here, is to signify the geometry of the effects and causes of total defense strategy. Every modern warfare demands a strategy that relates all the levels, considering the fact that it maintains every action benefited from those. Graham Stephen, *Cities Under Siege*, (Verso, 2011): 74

The unfolding of the 20th-century defense architecture reveals the factors that shaped the Gallipoli territory. Mid-century fortifications have become part of what is called “national frontiers”.⁶ Atlantik Wall, Hadrian Wall, Maginot Line can be listed as prominent examples in Europe.⁷ Similar practices were done around the Thrace, what is now called Çakmak Wall. The crystallizations of national frontiers and the fragmentation of city frontiers are in a transformational relation.⁸ Additionally, the space of frontiers in general is the space of confrontations which result in physical interactions of energies.⁹ The forms of these interactions have changed with the change of the frontier architecture. After the fragmentation of the city frontiers, fortifications of the 20th century has been reestablished with the rising political tension.¹⁰ In their book, *Architecture of Aggression*, Mallory, and Ottar points out that at the beginning of World War 1, cities of Liege and Antwerp were surrounded with several detached fortifications.¹¹ (Figure 1.2.) (Figure 1.3.) These fortifications have surrounded the cityscape with a “nesting” of circles. Apart from the historical fortification examples, such as tower houses, chartaques, casemate, etc., they signify the emergence of a new shape for the cities formed under new political tensions by producing a distinct form of control and monitor of its mechanism. This new formation points out an initiation of a network over the territory under the effect of national frontiers.¹² This network has generated a new and palpable relation between

⁶ Ibid.

⁷ Jean-Louis Cohen presents a remarkable number of posters and blueprints of the defense architecture during WWII. His work is significant in terms of contributing to discussions that circulate around this study. See: Jean-Louis Cohen, *Architecture in Uniform: Designing and Building for the Second World War*, (Editions Hazan, 2011)

⁸ Namık Günay Erkal, “*Haliç Extra-Mural Zone: A Spatio-Temporal Framework for Understanding The Architecture of The Istanbul City Frontier*”, (PhD diss. METU, 2001), 1-4

⁹ Ibid.

¹⁰ Keith Mallory & Arvid Ottar, *Architecture of Aggression*, (Architectural Press, 1973), 22

¹¹ Ibid.

¹² “Space itself can only be seen when caught in the net. It is as if the modern perforation and lightening up of architecture in the face of speed, industrialized technology, and mass production at the turn of the twentieth century has gone a step farther as buildings dissolve into information flow,

architecture and landscape, which helps to define the borders of the “bunker-scape”. Bunker-scape acknowledges the conditions of bunkering of the land as an operation of the *machine*. Neither the architecture of bunkers, nor the land that is occupied by them characterize the bunker-scape. It refers to the casting of ‘concrete networks’ which functionalize the land under the definitions and terms of military space. The term’s initial aim is to form a spatial understanding of bunkers in relation to frontier history and the geography it is deployed. Additionally, it tries to compensate for the discussion that questions the future of frontier architecture by focusing on the *prime time* of bunkers. This time interval includes approximately a hundred years of history.



Figure 1.2 Map of Antwerp in 1649 Source: Atlas Von Loon

Throughout the text, bunker-scape will be unfolded with its constituents of its landscape and its spatial organization. The landscape whose certain topographical features are functionalized by the same systematic approach that cast bunkers will be called “bunkered landscape”. Moreover, the collection of architectural qualities, forms, the issue of durability and materiality and the mechanisms that permit the interrelations between bunkers will be referred as “bunker architecture”. Bunker

to be either discarded as a relic of a previous time or nostalgically preserved as a quaint memento.” Mark Wigley, “Network Fever”, *Grey Room*, no 4, (2001): 8

architecture is also consisted of typological dissolutions of structures in relation to geographical formations and their classification in additions to operations and actions that permit the events and performances.

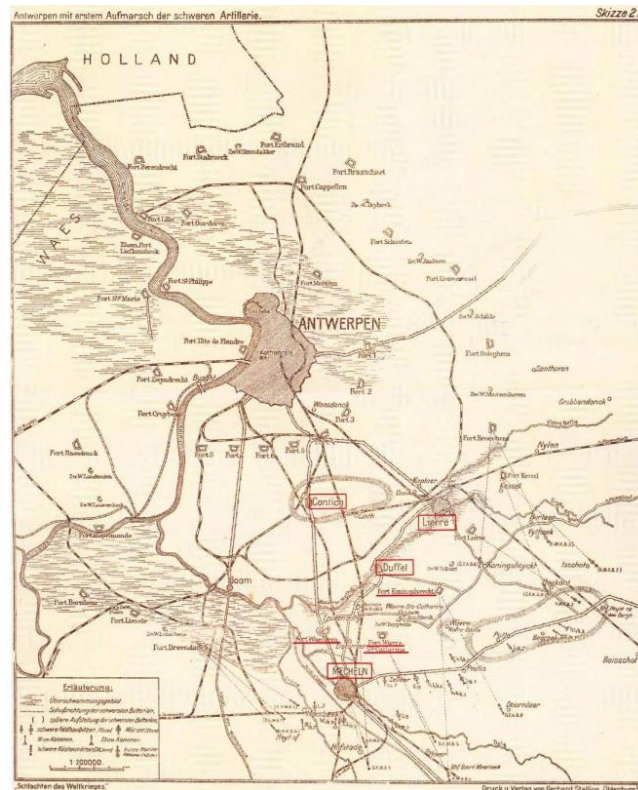


Figure 1.3 Map of Antwerp's detached forts in 1914 Source: Erich von Tschischwitz, Antwerpen 1914. Unter Benutzung der amtlichen Quellen des Reichsarchivs, Oldenburg/Berlin 1925, Sketch 2

Starting from the preliminary appearance and continuing with its practice in vast numbers, bunker-scape has been an indication of “extremity”. Brian Hatton considers the cryptic character of bunkers as a resemblance to bank vaults.¹³ Jason Payne uses the term “bunkerization” in the case of Albania bunkers which were built by Enver Hoxha regime after WWII. The author defines the case as a “compulsive social engineering project.”¹⁴ Stephen Graham divides the architectural operations into two components in relation to their vertical movement: moving bunkers underground,

¹³ Brian Hatton, “Strategic Architecture”, *AA Files*, no 42, (2000): 28-35

¹⁴ Jason Payne, “Projekti Bunkerizmit: The Strange Case of Albanian Bunker”, *Anyone*, no 31, (2014):161-168

together with mines, and sewers.¹⁵ With them burrowed underground, Tung-Hui Hu highlights that bunkers gain new functions such as the collector and protector of data.¹⁶ According to Mike Gane Paul, Virilio was mostly interested in the brutality of those structures.¹⁷ Additionally, Virilio embarks upon the most significant role of the violence-based strategy is the elimination of all the motivation to resist the attack.¹⁸ According to his writings, an army is mobilized in order to prevent any form of bloodshed, as well as, a defensive strategy is established not only to prevent infiltration but also construct a mechanism which will devour the possibilities of fission.¹⁹ Bunkers in Gallipoli can be declared as part of the measurements taken by the mechanism to avoid fission not by eliminating the possibilities but by creating a *repellent and brutal* “scape” to serve the mechanisms of the machine. With the emergence of separate walls between Syria and Turkey and new design of gendarmerie outposts, the eminence of a survey on bunkered landscape and bunker architecture – together crafting a bunker-scape- bursts into sight. What can the theory of architecture say about the relation between bunker-scape and the reactivation of the territorial control mechanisms in the twenty-first century? Shouldn’t theory provide an update by conducting an in-depth investigation of military architecture and network technologies, and eventually the *internet* in order to understand the vitality of the relation between civic and military architecture? As predicted by M. Pawley in his book *“Terminal Architecture”*, the architecture of the century will create spaces of containing and protecting the new informational technologies.²⁰ The following study consists of the framings of bunker-scape as part of the contextualization and perception of the war machine, over the territories and architecture.

¹⁵ Stephen Graham, *Vertical*, (Verso, 2016): 26

¹⁶ Tung-Hui Hu, *Data Centers / Data Bunkers, Prehistory of the Cloud*, (MIT Press, 2015): 92

¹⁷ Mike Gane Paul, “Paul Virilio’s Bunker Theorizing”, *Theory, Culture & Society, Thousand*, vol 165 (5-6): 85-102

¹⁸ Paul Virilio, *Speed and Politics*, (Semiotext(e), 2006): 31

¹⁹ *Ibid.*

²⁰ Martin Pawley, *Terminal Architecture*, (Reaktion Books, 1998): 28

The study heavily depends on the theories and concepts that are put forward by Bernard Cache in his book *Earth Moves: The Furnishing of Territories*.²¹ Cache is a theorist and architect, known for his work on conceptualization of “non-standard architecture”.²² Cache is known for his exhibition in Centre Pompidou in 2003 where he explores architectural concepts and modes of production with digital tools. His work mainly consists of historical and philosophical questioning of material technologies.²³ Cache’s method of understanding the architecture is based on redefinition of the term “image”. He starts by stating that his book is a “classifier of images”.²⁴ According to Cache, images are recordings of optical interactions whose “calculation” and “manipulation” attain the *architecture*.²⁵

The second chapter where the image of Gallipoli territory is drawn takes frontier architecture as its constant. It starts with creating its “mnemonical” sculpture in which the tenability of the territory is represented with the abstraction of geographical geometries. The thesis puts a “territorial image” of Gallipoli peninsula forward by examining the four historical stages of its frontier geographies. After investigating each historical stage, in accordance with the chronology of forces, the image zooms into the bunkered landscape. In the third chapter, frame concerns with the architectural image of the bunker, focusing on the fluxes, positions, and operations made on them. The image embarking upon the spatial organization of the land and bunkers is framed with three functions of architecture: separation, selection, and elimination. The explanations of these three functions are elaborated in relation to the movements, trajectories and surface qualities. In other words, this set of acts dissects, bends and folds the military space to ‘realize’ bunkers. After contemplating the relation between the forms and functions of defensive architecture in military space the survey of the

²¹ See: Bernard Cache, *Earth Moves: The Furnishing of Territories*, (MIT Press, 1995)

²² George Legendre & Bernard Cache, “George L Legendre In Conversation with Bernard Cache”, *AA Files*, no 56 (2007): 8-19

²³ Bernard Cache & Patrick Beacu , “Objectile” exhibited in Centre Pompidou 2003, Available at: <https://www.centrepompidou.fr>

²⁴ Ibid. Bernard Cache

²⁵ Ibid. Bernard Cache

territory will be presented to finalize the study. The survey is composed of the explorations the bunkers in Bolayır isthmus, which is conducted in April 2019. This survey adds a typological study of bunkers, within which degradation of functionality can be observed between the types. This chapter provides insights from the existing topography and contemporary condition and at the same time, a unique opportunity to re-visit the theoretical discussion over the factual content of the Gallipoli bunker-scape.

CHAPTER 2

TERRITORIAL IMAGE OF THE GALLIPOLI PENINSULA

2.1. Peninsula as the “object” of study

In order to construct the image of the recent realization of the *wall* in various geographies, it is necessary to understand the *actuality* of its being. Observing the change in the functions of the wall is an option to convey the *in-act* condition. Therefore, this study embarks upon the conceptualization of frontiers via distinguishing their functional capacities, in relation to terrain and operational tools. This conceptualization is constructed upon a case of frontier geography from Turkey, Gallipoli. The main aim of the following study is to frame a territorial “image”, taking a recent example as its object. Bunkers, in this respect, are worth examining, since their actualization in the territory points out a rationale that can unfold the processes of *new frontier architecture*.

Gallipoli peninsula is the ending piece of the Eastern Thrace, situated next to one of two straits of Sea Marmara, the Dardanelles. Peninsula has been a land for many battles since prehistorical ages.²⁶ These conflicts left behind a respectable amount of military objects, trenches, castles, redoubts, and bunkers.²⁷ In addition to these remnants of military architecture, there are also several memorials for the remembrance of the conflicts.²⁸

²⁶ See: Mehmet Özdoğan, “Prehistoric Sites in the Gelibolu Peninsula”, *Anadolu Araştırmaları*, (2012): 4-12

Reyhan Körpe, & Mehmet Özdoğan, “The Ancient Ports of the Thracian Chersonesos., Harbors and Harbor Cities in The Eastern Mediterranean From Antiquity to The Byzantine Period: Recent Discoveries and Current Approaches” Conference paper, (2011): 5-19

²⁷ Ayşe Türker, “The Gallipoli (Kallipolis) Castle in the Byzantine Period” *Δελτίον Χριστιανικής Αρχαιολογικής Εταιρείας*, (2007): 55-66

²⁸ Op.cit. Ahenk Yılmaz

The studies focusing on the remembrance of the battles are highly concerned with the Southern part of the peninsula which has become one of the formidable fronts during World War 1.²⁹ Most of the recent research are prone to highlight the strategic importance of the strait as a one-way connection.³⁰

However, the peninsula could be better investigated when Dardanelles is considered as a dual passageway. Throughout the history of Gallipoli, both sides of the strait were occupied with military architecture to assure a controlled passage in two directions, one from the Aegean to the Marmara Sea, and the other from the European side to the Asian side. When French King XIV. Louis ordered Gravier D'Ortières to prepare a detailed documentation of Dardanelles' geography, the aim was to reach Istanbul.³¹ Thus, when armies of Xerxes and Alexander used the passage to reach the Anatolian side.³²³³

The overlapping of these two movements, 'fluxes' over Dardanelles has prepared the territory for military action. Moreover, this 'crossed' flux can be pointed out as one of the major factors effecting the commence and the conduct of wars. As such, by constituting the convenience for overland and oversea transportation, the peninsula has been providing significant mobility to the territory, by being major reason and the geography, at the same time.

²⁹ See: Demir, *Çanakkale Savaşları Tarihi*, (2008), Vandiver, *Stand in the Trench Achilles* (2010), Taylor and Cupper, *Gallipoli - A Battlefield Guide* (2000), Hamilton, *Gallipoli Diary* (1920), Gilbert *The Straits of War - Gallipoli Remembered*, introduced by Sir Martin Gilbert (Gallipoli Memorial Lectures 1985-2000) (Stroud, 2000)., Liman Von Sanders, *O. Five Years in Turkey* (1927).

³⁰ Turkish historiographer Halil İncalcık's work summarizes the important events about Dardanelles as an axis between Mediterranean Sea and Marmara Sea during Ottoman rule. See: Halil İncalcık, "Çanakkale Tarihi, Çanakkale Boğazı Özeti ve Kronolojisi", (Değişim Yayınları, 2008)

³¹ See: Faruk Bilici, *XIV. Louis ve İstanbul'u Fetih Tasarısı-Louis XIV Son Projet de Conquete D'Istanbul*, (Türk Tarih Kurumu, 2003)

³² Fevzi Kurtoğlu, *Gelibolu Yöresi ve Tarihi*, (Resimli Ay Matbaası, 1938): 45

³³ Hammond & Roseman, "The Construction of Xerxes' Bridge over the Hellespont", *The Journal Of Hellenic Studies*, (1996): 116

2.1.1. Remnants of a war-broken territory³⁴

The topography of the Gelibolu peninsula has great importance to its establishment in terms of its tenability. The city is located between Dardanelles strait to the east and Mount Kuko to the west. The center is situated closer to the northern end of the strait. The rising topography around the western part of the land provides security to inner parts. (Figure 2.1.)



Figure 2.1 Aerial photograph map showing the topography of the peninsula Source: The Australian War Museum, author unknown, 1915

This concerns for exploring tenable features of the site is taken further by constructing several castles and redoubts along the shores. Two of the most known examples are

³⁴ Op.cit. Ahenk Yılmaz

Seddül-Bahir and Kilid-Bahir Castles located on the opposite shores. Kumkale and Kala-i Sultaniye Castles, too, can be listed with a similar formation. Semavi Eyice's study, *Çanakkale Hisarı* descriptions of Kala-i Sultaniye Castle.³⁵ For the others, the collaborative work of David Nicolle and Adam hook, *Ottoman Castles 1300 – 1710* provides an overall information.³⁶ Additionally, Çimpe Castle, on the northern part, is another military landmark which guards territory for centuries. (Figure 2.2.)

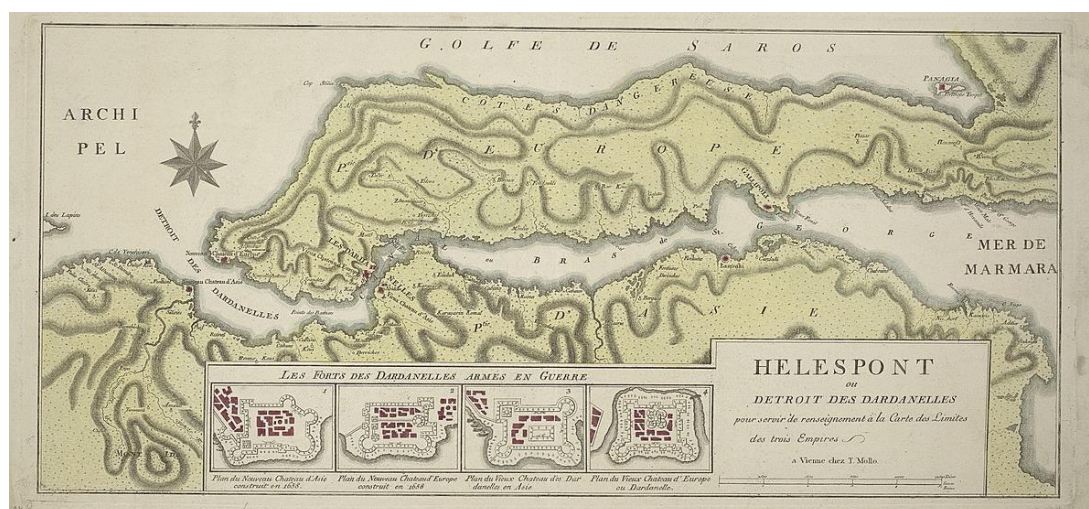


Figure 2.2 Locations of castles in Dardanelles Source: Leibniz-Institut für Länderkunde, Leipzig, Tranquillo Mullo, 1658

Several studies about Gallipoli as a military land has focuses on the events of WW1. Alan Moorehead, in his book *Gallipoli* narrates the events happened during the warfare starting from 1915.³⁷ The historiography of the territory is dedicated to the heroisms of Anzacs and Turkish troops. In Peter Liddle's book, *The Gallipoli Experience Reconsidered: In 1915 and In Retrospect*, a wide range of these stories are compiled in an aftermath.³⁸ The peninsula's potential of creating a mythic history is

³⁵ Semavi Eyice, "Çanakkale Hisarı" accessed 24/9/19 <https://islamansiklopedisi.org.tr/canakkale-hisari>

³⁶ See: David Nicolle & Adam Hook, *Ottoman Castles 1300-1710*, (Osprey Publishing, 2010)

³⁷ See: Alan Moorehead, *Gallipoli*, (Harper Perennial Modern Classics, 2002)

³⁸ See: Peter Liddle, *The Gallipoli Experience Reconsidered: In 1915 and In Retrospect*, (Pen & Sword Books, 2015)

highly related with its geographical features. A detailed information of the topography and its cartography is provided in William Cartwright's article, *An Investigation of Maps and Cartographic Artefacts of the Gallipoli Campaign 1915*.³⁹

Less-explored examples of the remnants are the bunkers that were constructed in 1939 with the initiative of General Fevzi Çakmak.⁴⁰ Invasion of Nazi Germany towards Greece and Bulgaria in late 1930's had triggered some measurements in Eastern Thrace, which eventually led to construction of Çakmak Line.⁴¹ One of its branching implementations of the line is related with the bunkers in Gallipoli Peninsula. The information about the measurements taken for the defense of the territory in WW2 can be found in study of local academicians and scholars.⁴² Hüznü Özlü's article provide the archive documents affairs with British commanders and delegates during the commence of the measurements.⁴³ There is also a chance to catch a glimpse of the construction processes of bunker from the eye of the architect, Orhan Alsaç. Orhan Alsaç, one of the prominent figures in Turkish architecture, had attended the construction of bunkers during his military service. The book edited by Üstün Alsaç and Gülçin İpek, in the memory of Orhan Alsaç, a brief text about the construction of bunkers in Gallipoli is provided.⁴⁴ Additionally, in 2004 Betonart, an architecture magazine in Turkey, prepared its fourth issue about the bunkers of Çakmak Line and Gallipoli. The issue is edited by Hülya and Ferhan Yürekli and consisted of articles written by Deniz and Sevim Aslan, Aykut Köksal and Okan Usta, and John A.

³⁹ William Cartwright, "An Investigation of Maps and Cartographic Artefacts of The Gallipoli Campaign 1915", *Geospatial Visualisation, Lecture Notes in Geoinformation and Cartography*, (Springer, 2013): 19-39

⁴⁰ Mithat Atabay, "Çanakkale During the Beginning of World War II (1939-1942)", *Çanakkale Araştırmaları Türk Yılı*, vol 19, (2015): 23

⁴¹ Türkan Doğruöz & Esra Çavdar, "Trakya'da Yeşilyurt Journal: An Evaluation Concerning The News Of 1944", *Journal of History and Future*, vol 2, no 2, (2016): 38

⁴² Ibid.

⁴³ Hüznü Özlü, "Discussions of Turkish-British Delegations and The Measures Taken for The Defence of İzmir and Thrace in World War Two as Per Archive Documents", *ÇTTAD*, 24, (2012)

⁴⁴ Üstün Alsaç & Gülçin İpek, *Orhan Alsaç: Bir Türk Mimarının Anıları, Yaşamı, Etkinlikleri*, (Yem Yayınları, 2003): 44

Campbell, discussing the materiality, tectonics and forms of the military architecture of the time.⁴⁵

2.1.2. Sculpting the territory



Figure 2.3 The locations of the geographical formation in the peninsula Source: author

This chapter starts with the methodology derived from the contemporary theoretician and architect Bernard Cache's prominent work: *Earth Moves*. Bernard Cache defines *Earth Moves: The Furnishing of Territories* as a "classifier of images".⁴⁶ The inflections and vectors are fundamental terms of his discussion. Cache proposes a redefinition of the image which is a "folded" one with the framings of the elements of the image: "inflection and vector".⁴⁷ According to Cache, frame highlights the work of the architect as the "art of framing", therefore any image involving the elements

⁴⁵ See: *Betonart*, vol 4, (2004)

⁴⁶ *Opcit.* Bernard Cache

⁴⁷ *Ibid.* Bernard Cache

becomes part of the discourse.⁴⁸ The book is consisted of two main practice of the image, one classifying the territorial qualities and the other, excavating the forms and functions of architectural practice.

In territorial image, Cache studies the historiography of the city of Lausanne. His examination of Lausanne's topographical formation through its urban history provides a theoretical framework for analyzing Gallipoli's territory. That is, the formation of the territory, in Cache's terms, can be considered as a sculpting process that operates through abstract and concrete forces.⁴⁹ In his exemplary method, Cache proposes a sculptural "objectification" of Lausanne's topography according its political, religious and logistical considerations.⁵⁰ (Figure 2.4.)

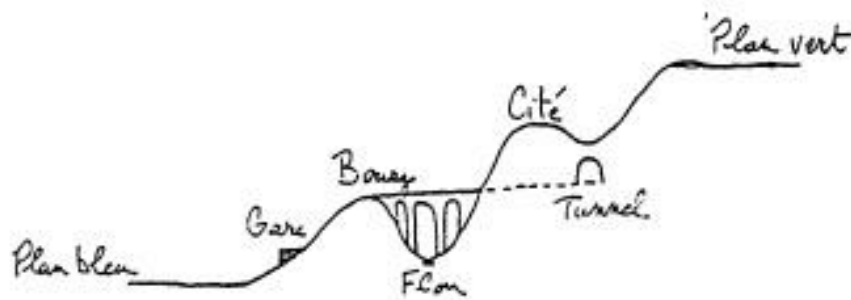


Figure 2.4 Diagrammatic representation of the section crossing crystallizations of political, religious and logistical concerns of Lausanne. Source: Bernard Cache, *Earth Moves: The Furnishing of Territories*, 1995

In Cache's terms, to delineate an object that is drawn out of a territory, it is necessary to compile the forces that shape the contours. There are forces that shape the

⁴⁸ Ibid. Bernard Cache

⁴⁹ Cache prefers the term "vector" instead of the "force". However, in this thesis vectors and forces are used interchangeably.

⁵⁰ Here, Cache proposes a cubist assembly of geometric objects in relation their vectoral ascensions. He exemplifies the position of the church to be on top of a ridge, since its abstract vector pulls it against the gravitational vectors. He proposes a cone for this imbrication.

topography, giving it a *distinctive* form. Most of the Cache's analyzes on the territory of Lausanne are established in relation to circulation of forces.⁵¹ There are also forces that circulates around these distinctive formations. At the same time, the geographical formations are an important factor in the creation of the circulating forces. He distinguishes two types of forces: the concrete and the abstract. Lausanne is, therefore, studied with the displaying of these two types of forces and their collaborations. For example, Cache implies that once an abstract force propels "ascension", such as religious forces in Lausanne, the concrete forces work together to a maxima, in this case to the ridge.⁵²

Apart from their relation, their distinction should also be made. This the differentiation, too, can be made in relation to the settling of edifices- or landmarks and artworks. To illustrate, for a city to locate itself on an intersection of flux, a combination of vectors discovers the order of the deployment for the locations of the edifices.⁵³ Abstract vectors can shape and relate to a tangible environment by proposing a circulatory routes, vantage points, or even blocking and regulating elements for the flows. On the other hand, the structural formation is shaped with a combination of concrete forces. Simple physical interactions in tangible environment, including operational acts of frictions, oscillation, refraction, pulling and pushing. Such as, bricks collapse onto each other and hold the structure with the use of friction, which is produced by concrete forces. Additionally, natural forces such as gravity, the currents, and the flows can be related to concrete forces. (Figure 2.5.)

⁵¹ The methodology of Cache does not clearly abandon the relation between forces that shape topography and that circulates the topography. However, the image he provides focuses on the juxtapositions or oppositions of forces that shape the architecture and the city.

⁵² Ibid. Bernard Cache

⁵³ Op.cit. Wim Nijenhuis

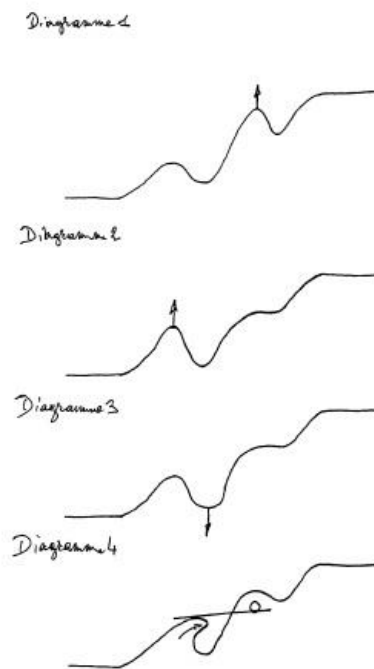


Figure 2.5 Diagrammatic representation of concrete and abstract forces. Starting with diagram 1 and diagram 3, concrete forces shapes the topography in two different directions. While River Flon creates a valley with a vector towards the ground, the tectonics movements rise the plateau. On the other hand, in diagram 2 cathedral follow the *ascending* vectors by locating itself to the rocky spur. Another abstract force connects the plateau and the spur with logistical concerns. Source: Bernard Cache, *Earth Moves: The Furnishing of Territories*, 1995

In the book, the author stresses the importance of River Flon and its capability of carrying material and information. In that manner, its significance can be illustrated in relation to both types of forces. (Figure 2.5.) The concrete force of gravity coincides with the construction of artworks such as bridges and tunnels amplifying its potential. Gravitational vectors pull the information from the crest of Flon. Later, Cache portrays a hierarchical layout of governance that is derived from this composition of the land. He concludes the findings with the nesting of cubist forms.⁵⁴

⁵⁴ Op.cit. Bernard Cache

With similar yet different terms, the city of Gelibolu has been challenged and shaped with its topography not by itself but together with several other small cities around. Therefore, drawing the sculpture of the territory initiates the framing of the territorial image. It might be helpful to remind that this shape is an interpretation from a 2D medium. In that sense, the example of Cache's understanding of objectification of a topography – for the case of Lausanne – provides the basic notion of the sculpture. Gallipoli's objectification – unlike the one for Lausanne which is prepared with political, aesthetic and religious endeavors - can be sculpted with the vectors and forms which express the tectonics of geography according to defendability.

There are three major geographical formation of Gallipoli that effects the tenability of the territory. The isthmus, the southern plateaus, and the strait are the major forms. Therefore, it can be said that a combination of these three geometries which are prefigured from those land pieces could be the initial definition of the sculpture. Firstly, the Bolayır isthmus serves as a passage point. This passage provides the primary overland distributor of the peninsula which meanders around the hills of Bolayır, reaching to the eastern shores of Dardanelles. The flux that circulates between İstanbul and the peninsula is provided through the passage. Its definition deploys a similarity between the isthmus and the valley of Flon in terms of their capacity to carry goods. At the same time, it functions as a defensive point on which this flux was kept under control, unlike Flon. The isthmus, stretching between waters of east and west promises a tunnel like shape for the land, since like a tunnel it is surrounded by a screen, separating itself from both sides. The second topographical figure is the strait. Among the hills, there are several lowlands and valleys in addition to alluvial beaches. Strait divides the plains and establishes a circulation route. The circulation inside the strait is *bidirectional*, connecting two seas. Strait situates the fortresses as they can cover areas with respect to each other's. As well, the city centers are also settled along the shores of the strait. With this kind of a role, it resembles a tube leaning on both sides and the parts inside the tube – the cities, forts and ports – are regulated regarding the circulation inside. Finally, the Koku mountain range which is situated on the

western side provides the main elevation to the land. It fortifies the western part protecting inner settlements. Meanwhile, it blocks fluctuations that would connect the Aegean Sea and Dardanelles. Therefore, it could be read as a palisade structure, as instead of regulating the site, it prevents connection.⁵⁵ The continuation of this palisade formation can be traced to the southern part with the addition of three other hill ranges. These ranges are the one starting from Çanaktepe to Suvla Bay, and another one rising with the Bakacak tepe, connecting to Mount Kalkmaz to the south. The last ones are the hills that surround the southern vineyards and alluvial beaches. Those stretching in the north-south axis, have small openings for infiltration. (Figure 2.6.)

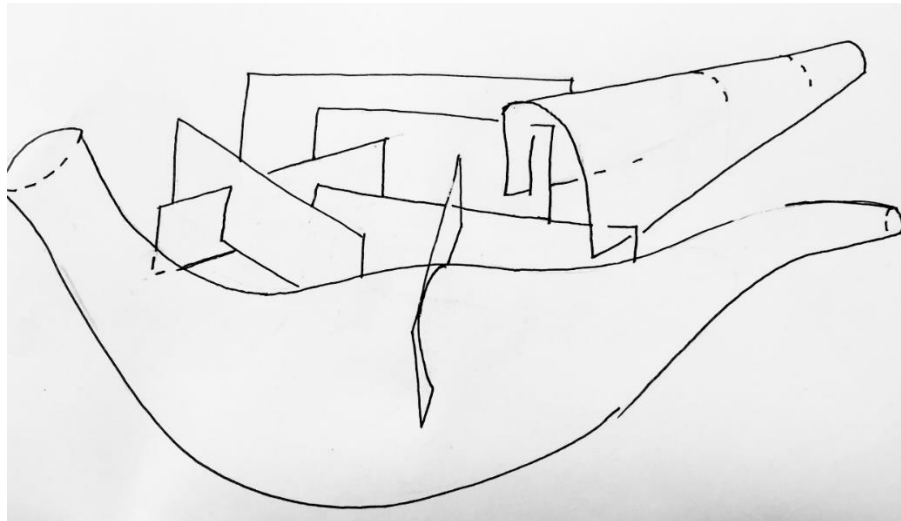


Figure 2.6 Sketch of the mnemonical sculpture of Gallipoli peninsula, the passage, the palisade and the tube, Source: author

The abstractions and objectifications of the process according to the tenability of the geographical formations pins the possible battle zones. The terrain is an important factor on the battlefield, changing the contours. The contours of the battle zones are harbored within the terrain of a battlefield. It provides the difference in superiority

⁵⁵ Nijenhuis associates the concept of the palisade as one of the first defensive structure. Op.cit. Wim Nijenhuis

according to the positioning of forces for defense and attack. These factors can be reconfigured as a mathematical and geometrical order that helps to unfold different values of superiorities. In order to constitute an order, the terrain in military architecture can be deduced with inflection points and vectors.⁵⁶ Before deriving the contours from the historical context of the Gallipoli Peninsula, some definitions of the frequently used terms needs to be provided. A simple description of the term inflection will be about the change in direction of a curve. The point where a line defines a new direction in the curvature will be mentioned as an inflection point. There are two conditions of inflection; extrema and middle. Points positioned on minima and maxima indicate inflections. Similarly, the middle point of a section where the tangent of it crosses the curve also creates an inflection.

When the territory is revealed in such a way with the dominance of these three geographical formations, the isthmus, the strait and the plateaus they are reconfigured relations with forms of the passage, the tube, and the palisade. (Figure 2.6.) As such, the abstract and concrete forces create these figures and the ones that are formed by three figures finalize the overall sculpture. In the following parts, the constitution of the territorial image will follow a chronology of the activation the forces around these formations.

2.2. The activation of forces throughout the military history

In the military literature, Gallipoli had been heavily studied for its unique spatial qualities Especially regarding the defensive strategies, its topographical conditions were examined and used by the military personnel, while designing the battlefield.⁵⁷ Therefore, the territorial image of the Gallipoli is highly associated with the features of the terrain. As argued in the previous section, three components with their

⁵⁶ Both terms are borrowed from mathematics. This study contains their expansion on the terrain, which was originally used by Bernard Cache.

⁵⁷ Op.cit. William Cartwright

relationships between geography and their abstract forces can be analyzed according to the defense and control of the territory.⁵⁸ Although the boundaries between each part have blurry sections, they can be distinguished with the concentration of forces. In that sense, examinations and interpretations of forces – both abstract and concrete – will be used as a tool to circle around those three parts.

One of the first activations of forces starts with the construction of Miltiades' wall on isthmus. Those walls were built to protect the inner Chersonese, dating back to 6th century BC and repeatedly reemerged for about a thousand years.⁵⁹ The second activation coincides with early Ottoman installations of several castles and ports between the 14th and 18th century around the strait. Among others, this period can be interpreted as a shift from protecting the peninsula to the defense of the strait. Finally, the southern part harbors the plateaus with the entrenchments done during WWI.

2.2.1. Refraction of forces around the 'passage'



Figure 2.7 Refraction of forces around the isthmus Source: author

The abstract and concrete forces tend to crystalize around certain topographical limits – in our case, these limits can be identified with borders and furthermore, such borders

⁵⁸ Op.cit. Mehmet Özdoğan

⁵⁹ Opcit. Mehmet Yavuz

usually frame the passage- type formations. In fact, walling around the passages has been a norm for many centuries. Long Walls of Thrace sets a primary example.⁶⁰ While walls regulated the entrances, they indicated explicit boundaries. In that manner, setting the boundaries for northern tribes in Gallipoli was a continual practice since the erection of the walls covering the isthmus of Bolayır.⁶¹

As such, the Bolayır territory is one of the focal points in the territory as it occupies a critical point for the defense of the peninsula. The area has a border between two sides with the sea and has an elevated ground that enables the control of the isthmus. Hence, the tenable characteristics of this area is very important for the history of the territory. The construction of the first wall was recorded to be started with Miltiades' influence.⁶² Before the second wall, for about 120 years, Trak tribes and Athenians had consistent conflicts.⁶³ To end these conflicts, Spartan general Derkyllidas were recorded to have constructed the third wall.⁶⁴ As stated by Mehmet Yavuz, the resources have shown that there is a fourth and the fifth wall. The image of the isthmus attracts two formal recognition. The first one is that the territory cannot remain stable in terms of abstract forces. There have been several fluctuations and attempts to control it. Secondly, this narrow passage has been attracting concrete forces to establish a wall over the centuries. While abstract forces of neighboring communities mobilized their systems, concrete forces established clear distinctions between their territories. As forces multiply and reach a state of equilibrium, the image of isthmus has rendered a wall. Additionally, Yavuz stated the effect of seismic activity had helped demolished the walls. In that, not only by abstract forces but also concrete forces have changed the state of equilibrium in the territorial image by instant erections and demolitions of the walls. It is no coincidence that the passage was

⁶⁰ Jacek Wiewiorowski, "The Defence of the Long Walls of Thrace Under Justinian the Great", *Bulgaria Mediaevalis*, vol 3, (2012): 185

⁶¹ According to the work of Mehmet Yavuz, which is focusing on the walls of the isthmus, it was mentioned that they were built by several rulers yet with similar purposes. These walls were constructed for the prevention from raids. Op.cit. Mehmet Yavuz

⁶² Ibid. Mehmet Yavuz

⁶³ Ibid. Mehmet Yavuz

⁶⁴ Ibid. Mehmet Yavuz

occupied with a wall several times since there are other occasions that the walling of the territory was tested by the forces.

One of the two main sites that should be investigated in the first node is the city center of Gelibolu. Being the main node that the passage connects to, city center also highlights another form of limit. Walls of the city center establishes a limit in the form of a “city frontier”. Starting with the Castle of Gelibolu, which is located on the hilltop of the city, should be highlighted.⁶⁵ Three main duties that the castle had dealt with can be listed as, control of the commerce, defense of the bay and strait, and housing a regulator of power for the city.⁶⁶ Although it is a small city, Gelibolu creates dense instances of networks and multiplicities, constituting the machine that governs the city.

Dockyards in Gelibolu has become one of the main attractors during Ottoman era in Gallipoli, being the first notable attempt in the creation of a *fleet in being*.⁶⁷ Ports are located on the largest bay which is the closest one to Sea Marmara, constituting an operculated mouth to the strait. This opercular cape is perpendicular to the currents of the strait. This perpendicularity helps ships to be freed of the current and later they shift the helm to the north, -to land. The energy, releasing from the transporters, desires to reach to the attractors to the specific points on the shores of northern and southern parts of the territory.

Both the city walls and the walls of isthmus provide a control mechanism over the fluxes. The strategical importance of Gallipoli has been constituted with its location between the cross-passage of two fluxes. This implication of being a cross-passage can be stressed in two locations; the strait and isthmus. Many attempts to benefit those passages have been concluded as the opposing forces constructing walls and fortresses. Therefore, the vector scheme of the peninsula can be read like a “cross”

⁶⁵ Op.cit. Ayşe Türker

⁶⁶ Paul Hirst, “Defense of Places: Fortifications as Architecture (part 1)”, *AA Files*, no:33, (1997): 21

⁶⁷ A Virilioan term fleet in being, which was originally belongs to Lord Torrington who was an admiral and a naval tactician, can be described as a form of efficiency that prevents the loss of force by reserving the “right” to act.

which is above the strait and the isthmus. The main absorbent that of two can be located around Gelibolu Castle. Moreover, several additions were done during the Ottoman era was due to the defense of the strait.

The double-articulated formation between concrete and abstract forces crystalizes the cities of Dardanelles. The relations between the forces and formation of those cities needs a further reading of the tenability of the territory.

2.2.2. Centrifugal forces around the ‘tube’

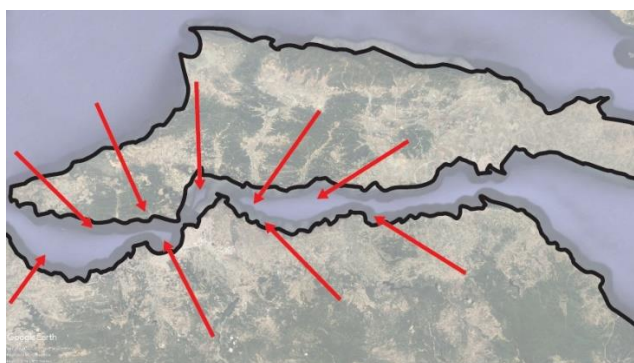


Figure 2.8 Centrifugal forces around the strait Source: author

The strait propels a centrality in relation to the fluxes and forces. Furthermore, the cities around the strait are affected with the ‘centrifugality’. These forces draw the fortifications and cities to the strait’s center, the Narrows.

Firstly, the city of Lapseki is confronted with the city of Gelibolu so that the transportation route to Asia minor could be sustained.⁶⁸ The concrete forces, the current of the strait, draw the cities to be located in accordance with each other. Winds and currents from north to south are also effective in this manner. Especially during winter, the flows and currents gain strength. Within this changing environment of

⁶⁸ See: İsmail Hakkı Uzunçarşılı, *Osmanlı Tarihi*, 1. Cilt, (Türk Tarih Kurumu, 1988)

speed and magnitude, the port of Gallipoli has altered in a respecting fashion. The port was a small destination in the Greek.⁶⁹ The change in the accumulation of forces around the in port of Gallipoli changed what it reflects on the other side of the strait.⁷⁰ As such, considering the energy that a ship sailing to Gelibolu from Çardak, convenience the current will provide would not be as much as it would provide to its equivalent that is sailing from Gelibolu to Lapseki. With the gaining importance of Constantinople during the Justinian's ruling, Gelibolu city has become an eminent figure too.⁷¹ This importance attracted forces to accumulate around the city. A secondary route from the capital to Asia minor has been generated connecting the Adrianople and Thrace.⁷² For this route to reach a stable state, the forces that fed Çardak city diminished their scalar magnitude while the ones that circulate Lapseki increased. Therefore, the city of Çardak has lost its scalar eminence under a scheme of abstract and concrete forces. The power gained by Gallipoli affected the circulation route, so that, currents compelled the ships to reach Lapseki rather than Çardak.

For a long period, the defense of the peninsula was under the effect of the main attractor that has become the city of Constantinople. Starting from the mid-14th century, the fortification of the peninsula followed the vectors that were progressed around the fluxes of the strait.⁷³ After the occupancy of Ottomans in the peninsula, several naval routes were handed over to their control, resulting in the establishment of the first shipyard in Gelibolu ports.⁷⁴ While empowering the naval forces, the construction of fortifications started simultaneously on each side of the strait.

In 15th century, two castles were constructed facing to each other: Kal'a-i Sultaniye and Kilidül-Bahr Castle. Two-sided castle construction became the answer as

⁶⁹ See: John Buckler, *Aegean Greece in the Fourth Century BC*, (Brill, 2003): 489-524

⁷⁰ Op.cit. Fevzi Kurtoğlu

⁷¹ Op.cit. Fevzi Kurtoğlu

⁷² Op.cit. Fevzi Kurtoğlu

⁷³ See: Tursun Beg, *The History of Mehmed the Conqueror*, trans. H. İnalçık and R. Murphey, Biblioteca Islamica, (1978)

⁷⁴ Halil İnalçık, *The rise of the Turcoman maritime principalities in Anatolia, Byzantium, and Crusades'*, (1985): 179-217

reflections that are under a matrix of gravitational and abstract vectors. The abstract force scheme highlights that each structure pulls a certain amount of energy via which it can sustain an attack. At this point what should be included in the gravitational forces of the strait that release the energy was stuck between two sides running across to the Aegean Sea.

The flux of material and energy on the north-south axis, perpendicular settling of ports to the currents, a castle on the hill with an eminent figure behind, one may prepare a primal structuring of the vectorial scheme for the territorial image of the Gelibolu. A part of this image is constituted with additions of redoubts.

Construction of redoubts in Gallipoli peninsula and Biga peninsula dates back to 19th century.⁷⁵ Between 14th and 18th centuries the naval power of the Ottoman army has gained a significant increase. With the emergence of the dockyard in Haliç, Tersane-i Amire, the flow of material to Gelibolu dockyard decreased. However strategical importance of Dardanelles required defensive measurements, which might have influenced the location of the redoubts. Placements of redoubts are stressed since the vectorial scheme of Empire's decision mechanism highlights several intersections with the architecture of redoubts. The forces and vectors circulating the redoubt that are in play on the forming of its inner circulation, regulate the terrain and their capacity to control it. Therefore, it is important to understand this capacity is related to their locations.

In order to understand the significance of the locations of redoubts of the territory, first, it is necessary to outline the vectors governing the surrounding topography. There is a relation between the formation of the topography and the trajectory that a single defensive object can reach. That relation can be investigated with the discovery of the abstract vectors that play a role in the placement of those objects. Those vectors can be defined as the one that deploys the redoubts to *extremas* and the one that embeds them into the ground. While the former is situated against the gravitational

⁷⁵ Yusuf Acioğlu, "Çanakkale Tabyaları", *Sanat Tarihi Dergisi*, Vol XXV-1, (2016): 4

vector, the latter is parallel to it. The validity of having the high ground promotes the idea that suggests the former is scalarly larger.⁷⁶ However, pulling of earth towards the redoubt implies that these two vectors compete in opposite directions. Therefore, redoubts of both peninsulas are lured around the narrowest part of the strait. The constituents of them, the abstract force that enables redoubts to be located to the extrema and be associated with a surrounding terrain relates to the trajectory of defensive power.

Examination of this relation between the abstract vectors and the trajectory can be done via a discovery of concrete forces that circulates within. The whole arrangement is possible due to the constitution of a machinic circulation which enables redoubts to reach its “sweeping” area. To define this circulation, it is necessary to list the units that redoubt harbors; purveyance, barracks, dorms, and communications. For instance, the architectural program of Hamidiye Tabya (redoubt) has storage areas, dormitories, observation room, and training field.⁷⁷ The energy is stored and circulated inside the facilities of this fortification.⁷⁸ Large consumption of it refers to an implosion of the conserved portion. This primary yield, hence, made possible with concrete forces reciprocating among the spaces of a redoubt, allowing for a larger trajectory in cases of implosions. Likewise, the crystallization of those spaces is predefined to necessitate less energy and material, especially in the case of Gallipoli redoubts, than their ancestors.

The amount of energy and material for the deployment of a redoubt decrease within the regulation of forces. This provides an opportunity to construct in large quantities enabling a larger sweeping are. Recent records show that there are more than 30 redoubts in Gallipoli and Biga peninsulas. Although, the need for less energy increases the number of fortifications, in the case of Dardanelles strait, the magnitude of the narrowest part does not let those fortifications to be spread along the shores. Rather

⁷⁶ See: Baron de Jomini, *The Art of War, Complete Art of War*, (Start Publishing, 2012): 897

⁷⁷ Op.cit. Yusuf Acioğlu

⁷⁸ See: Sun Tzu, “Energy”, *Art of War, Complete Art of War*, (Start Publishing, 2012): 36-44

than being reflective to each other, the case of Dardanelles redoubts demonstrates a diagram of pulling to the middle where the land strives to meet. The centrifuge towards the Narrows is finalized, as it highlights the effects of naval regulations on the land.

Controlling the land is as much important as controlling the seas during combat. Although land forces differ from naval forces, the territorial image obtained of abstract and concrete forces can be understood in a similar manner. Following subchapters will establish a preliminary vector matrix for trenches which were constructed and used in the late history of Gallipoli peninsula.

2.2.3. Oscillation of forces around the ‘palisade’

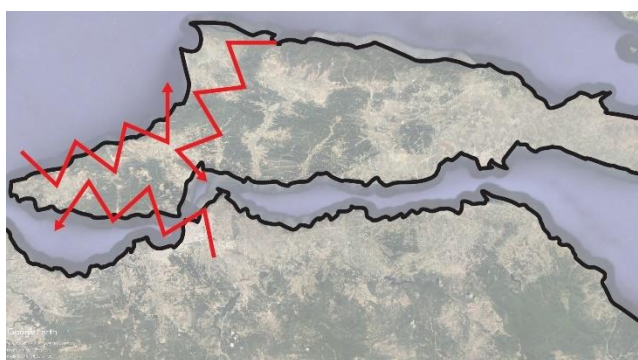


Figure 2.9 Oscillation of forces around the plateaus Source: author

Oscillation of forces can be observed in plateaus. The accumulations and their release created trenches. Firstly, entrenchments are one of the most significant types of fortifications in the history of Gallipoli. Starting from Russian War till the Great War both northern and southern shores have been heavily dug.⁷⁹ During that time period, the problem of protection against enemy fire is solved with going underground. In that, trench design has proceeded towards an elaborate form that regulates the

⁷⁹ See: Peter Doyle and Matthew R. Bennett, “Military Geography: The Influence of Terrain in the Outcome of the Gallipoli Campaign, 1915”, *The Geographical Journal*, Vol 165-1, (1999) 25

territory. Two distinct characters of its morphology can be investigated. While the planar organization of the trenches provides a web-like an arrangement, the sectional diagram is based on creating partitions. Examination of trenches via its architectural representations will shed light on the general understanding of Gallipoli's field fortifications as well as constituting the territorial image.

A trench can be defined as the zigzagging dugouts of the earth in accordance with the human body as a measurement.⁸⁰ The process that introduces the human size as the main proportion can be mentioned since it proposes a certain depth. To be clear, it is not designed as a hole with the size of a human body. In fact, it has corridors that connect inside and outside, constituting a web of circulation around topographical features. Exposition of a vectorial scheme will help to unfold this process of networking in relation to the concrete and abstract forces.

The encounter of opposing forces can be taken as a primary point. Both opposing armies are motivated with an abstract force yet braced with the concrete forces. The confrontation of those opposing forces is predestined to run across in a territory for battle. When they are unable to overpower each other, change of the speed conditions the directions. With the slowing of speeds, and reaching to an unsurpassable blockage, concrete forces provide the opposite direction to the gravity. Later, it is possible to observe that neither the circulation of forces nor the expeditions for new ways to penetrate the frontier stop. When the destination is reached and movement of forces is taken a level to the ground, sectional movement is decreased.

Secondly, the sectional study of the ground commences a manufactured territory. In an ideal battlefield, the territory called "No Man's Land" crystalizes in-between the forces. Opposing combatants seldom try to overcome the obstacles and enemy fire to reach to the other side. One can infer that earlier designation of forces still plays a role because minor attempts of bodily mobilization occur, after the occupation of the dug

⁸⁰ See: War Office, *Practical Geometry, Manual of Field Fortification, Military Sketching, and Reconnaissance*, (Andesite Press, 2017): 6

earth. However, abstract forces governing the mobilized troops, cannot penetrate the in-between territory, so they emplace them into the ground. Meanwhile, the urge of reaching to the other side continues with another form of a vector, originating itself to no man's land. Topographical qualities of the earth cannot provide an ideal plan of an entrenchment camp. Therefore, a design mechanism covers the earth, providing enough space for primary and supporting lines, and artillery emplacements in a networking structure. This structure can be defined with two sides divided with land in the middle.

2.2.4. Reactivation of the refractive forces around the 'passage'

The refractive forces that erected the walls of isthmus have been reactivated to create bunkered landscape. For Gallipoli, the emplacement of trenches had been a part of the strategies in southern shores as well as around the isthmus. Particularly, Bolayır isthmus has been reactivated between late 19th century and mid-20th century. By the mid-20th century, the stress on the territory has concentrated to form a crystallization of bunkers.

Bunkers are closely related to trenches. This relation can be explained in two ways. To begin with, primary examples of bunkers are found in entrenched fields. Since the intersection points of trench fields needed protection, these shelters were started to be called bunkers.⁸¹ The "interval of probability" can be filled with an explosion or loss on higher stakes on intersections. Like intersections, artillery and supporting elements of defense forces did too. Therefore, it is another place that a bunker can be found in entrenched fields. Secondly, when bunkers were constructed free from an entrenched field, their locations were studied to house probable intersections. Bunkers carry an understanding of the terrain with which they are placed. There are several examples of bunkers with a rampart attached or connecting to a tunnel. During the battle, these

⁸¹ Op.cit. Paul Hirst

structures extend and create passages between each structure. The existing tunnels of Çakmak Line propel this idea.⁸² Within this logic, being the continuation of Çakmak Line, Bolayır bunkers highlights two aspects when they are compared to initial examples of frontier sharing the same territory. Bunkers of Bolayır are different in organizational structure and use of the topography from the Walls.

The flux of material and energy on the north-south axis, perpendicular foundation of ports to the currents, a castle on the hill with a religious figure behind, one may prepare a primal structuring of the vectorial scheme for the territorial image of the Gelibolu. A part of this image is constituted with addition of bunkers with its circulation of forces around the limits. Meaning, Gallipoli act as a barrier towards the western fluctuations and yet creates connections to the east.

2.2.4.1. Changing forms of the Frontier

In conclusion, two outcomes can be reached within the study of territorial image. Firstly, frontier architecture faces a condition where it multiplies. It is clear that it changes locations regarding concrete and abstract forces. Starting from its first appearance in controlling the overland transportation of the northern part, with the change of the force matrix it moves towards the shores of Dardanelles. The effect of changing geography and the new force matrix have influenced the architecture of the frontier to disperse. This dispersive effect initiated the development of bunker architecture. Another outcome is the disappearances and reappearances of the frontier architecture. When it reappears, frontier enhances its interrelations. The web of relations that construct the frontier is encapsulated by its architecture. With the emergence of trench warfare in the southern part of the peninsula, the land was covered with a web of circulation. The network of earthworks indicates a transition

⁸² Deniz Arslan, "Özellikle Büyük Çekmece Koruganları", *Betonart*, Vol 4, (2004): 35

from a notion of mold and cast type of fabrication of architecture to a *geographic plexus*.⁸³ Considering the bunker architecture, traces of both logics can be found.

⁸³ "Technology philosopher" Mumford embarks upon the activities and events that are shaped by the communes. He explains a formation that are connected through change and deposit, with which he describes the culminations and cities. He later refers this environment of connectivity in a city as a plexus; Lewis Mumford, "What is a City?", *Architectural Record*, (1937): 93

CHAPTER 3

ARCHITECTURAL IMAGE OF THE GALLIPOLI BUNKERS

In military space, geographical forms are evaluated with functions. Functionalization of a land piece is a method for the assessments of warfare. When strategical thinking of a battle is concerned with the terrain, the tactical operations require the discovery of the functions that are situated on the *locus*. One will observe the characteristics of military architecture developed in accordance with the representation of a *raison d'être*. The walls become repulsive screens, openings become emplacements for firepower, slabs become in service of elimination.⁸⁴ The investigation of the reasons that are endemic to locus helps to produce the image of military space. This image is composed of architectural objects representing the functions that are attained through geographical formations.⁸⁵ As in mathematics, functions in architecture can be considered as estimations.⁸⁶ Adrian Forty embarks upon the description of the function in architecture in which consequences of the activities and operations are executed in relation to quantities.⁸⁷ The function in military architecture must be investigated with the reasons and their representations that shape the meanings, forms, and their movements. Similarly, in his book *Earth Moves*, Cache propels the notion of function with a pending approach. He conveys a study of function as the determinant of the architectural image.

⁸⁴ Virilio, *Bunker Archeology*, (Princeton Architectural Press, 1994): 17, 15

⁸⁵ Ibid. Paul Virilio, 17

⁸⁶ Adrian Forty, *Words and Buildings*, (Thames & Hudson, 2000): 175-195

⁸⁷ First usage of the term function in relation to architecture is by Carlo Lodoli in 1740s. Lodoli expresses the significance of function that he borrows the mathematical description of the term by Leibniz in 1690's, as follows: "Devonsi unire e fabrica e ragione e sia funzion la rapresentazione" (Unite the building with reason and let the function be representation) His main intention was to maintain an understanding which no architectural element will demonstrate any instance without referring to its function. Ibid, Adrian Forty

3.1. Architectural Image of Bunkers

Cache reconfigures the *image* of the architectural practice in the form of a function matrix. He designates several abstractions of functions such as separation, selection, and elimination to deploy a toolset. Any abstraction can be multiplied or be in various conditions of efficiency and effectuality. His text pursues a type of enunciation about the form-function discussion with a distinctive method of image creation.

The image of military space requires several framings of multiplications in the function matrix. Depending on the emergent character of the image, what Cache suggests is that there are multiple probabilities that create the framing of architecture. He starts by confirming the conventional meaning of the image: a visual recording.⁸⁸ An image is a set of information whether it is a painting, a photograph or an architectural plan. It records several types of data such as memory, description or instruction. However, Cache essentially focuses on the formal qualities embedded in an image rather than its content. He acknowledges the forms adopted by the content as sources of analysis. He makes his analysis with three aspects of the image. *Vector*, *inflection* and *frame*, the constituents of the image, become the tools with which their exposition makes any visibility turn into an image. Thereby, such understanding of aesthetics proceeds the discussion from the visible object to the next step, to the reciprocity of visibility.⁸⁹ The type of visibility Caché draws does not emerge from a static analysis of the surrounding habitat, but is excelled of inflections, vectors and their framings approaching the limits of perception and re-emerges in multiple forms.⁹⁰ The intention of declaring those aspects, therefore, is due to the need for

⁸⁸ Ibid. Bernard Cache, 1

⁸⁹ Paul Crowther refers to Jale Erzen in his text while inspecting the limits of human perception and “spatial aesthetic theory. Crowther highlights that recognition of the object-ness of an object is possible with “the principle of reciprocity”. Paul Crowther, “Embodiment and Architectural Cognition”, *Testimonial*, ed Ayşen Savaş, Sevin Osmay, (2017): 33

⁹⁰ Deleuze gives two definitions of framing, one with its geometry, one with its dynamic qualities, but always enclosed. He later continues, “And it is by this dovetailing of frames that parts of the set or of the closed system are separated, but also converge and reunited.”. His approach makes visible the “frames in frames.” The text of Caché brings out their ability to contain each other and, at the

establishing the connection between territory, architecture and their visibility. In order to depict the architectural image of bunkers – supposedly - constructed upon a matrix of abstract functions and their effectuality, - it is necessary to convey a list of terms that will bring about the course of the discussion.

3.1.1. Vector/Force, inflection and framing

The three terms of the architectural image are conceptualized within their effect on form. Vector, inflection and frame together constitute the image with derivations originating to terms of physics and mathematics. The common definitions of the terms will be sufficient to decode their correspondence in the present discussion. First, a vector, in mathematics, is defined with a straight line whose magnitude is derived from its length and whose direction in space assigns its orientation. When architecture speaks of vectors, it starts to discuss the past and present inclinations of its formal dynamism.⁹¹ A force, on the other hand, is appointed to the motion of objects. Applying a force to an object would disturb its static state or change the course of its movement. Although the distinction between the two can be elaborated with this notion, throughout the text they will correspond to similar conceptualizations.

Secondly, the term inflection usually collocates within the description of a point. In the graphical representations of equations, the inflection point corresponds to the shifting of inclination. The interrelation between vectors and inflection points can be subsumed with an examination of the orientation in a site. When two differently oriented vectors collide, there will be a point where the resulting entity resists the motion. This point does not react to the movement created by the vectors, yet it moves with the change of the movement itself. Therefore, it should not be understood as a static point, on the contrary, it is the main initiator of the change, and thus the dynamic

same time be contained by each other. Gilles Deleuze, *Cinema 1 Movement-Image*, (University of Minnesota Press, 1997): 14

⁹¹ Francesco Marullo, “Logistics Takes Command”, *Log*, No 35, (2015): 106

interrelations.⁹² These changes can vary from differentiations in frequencies, lengths, magnitudes, deviations, and oscillations of extrema.

Finally, with the introduction of the frame, the architectural image will be complete. Vectors and forces create fluxes around which inflections take shape, whereas, frames constitute series of functions in order to bring the accumulations gathered from the fluxes into recognition from a non-visible state to a visible one. A deliberate framing requires a set of principles which are necessary to understand the boundaries of what is obscure and what is recognizable.

3.1.2. Accidents and Frame of Probability

In Cache's formulation, the introduction of the abstract principles is done with the exploration of the unforeseen acts of nature.⁹³ Those acts play a role while framing the military space. With establishing the unpredictability into the center of the discussion, one acknowledges that military space is occupied with abuses and misuses of knowledge. That is the search for the limits of human comprehension is translated into a search for power in the most improbable ways. Since military space is overcome by the developments of science and technology, framing military architecture is only possible by determining the sources of the unpredictable. In the creation of the frame, Cache consults to Eugene Dupreel whose argument embarks upon the unpredictable as the element being comprised in intervals.⁹⁴ Referring to Dupreel, Cache stresses that the interval between causes and effects includes unpredictable events that might change the course of things. All forms of operations such as ripping, adding, juxtaposing, etc. will prevent and prosper the change that interval is filled with. Dupreel's opposition to the rationalist perception of causality can be established within a plain understanding of operations. According to Caché, what Dupreel

⁹² Op.cit. Bernard Cache

⁹³ Op.cit. Bernard Cache, 22

⁹⁴ Op.cit. Bernard Cache, 22

suggests is a *realistic* logic notion which brings out the interval into the focus. Whether the interval embodies forms of unexpected actions or it reconstructs a reality of events linked to each other. A similar notion is Husserlian *scientific realism* that highlights the functions of science.⁹⁵ According to Husserlian notion, science internalizes a contrast between its ability to predict natural events and provide a holistic description of them.⁹⁶ The whole cannot be set into boundaries of science, yet as it is pointed out our surrounding can be presumed to have likeliness. The space circulating around this contrast cannot reach to a state where it can subsume or rather exclude. In military architecture, the interval is reconceptualized to bring about the dispute between the war-machine and space. The same dispute also points out the problem of ‘technological development’. Technological dispute can neither fill the interval by itself nor avoid the creation of *accidents*.⁹⁷ As it is stated by Virilio;

“When you invent the ship, you also invent the shipwreck; when you invent the plane you also invent the plane crash; and when you invent electricity, you invent electrocution... Every technology carries its own negativity, which is invented at the same time as technical progress.”⁹⁸

In this case, the interval of the frame in military architecture is filled with the ‘functionalization’ of the “accidents”. Then, the deconstruction of the *frame of probability* in military space includes a transformation of the inabilities in science into accidents. Investigating the functions that create a space and the constituents of its practice would compromise between the accidents they deploy and probabilities that are unforeseen.

⁹⁵ Garry Gutting, “Husserl and Scientific Realism”, Vol. 39, No. 1, (1978): 45

⁹⁶ Ibid.

⁹⁷ Benjamin H. Bratton, “Logistics of Habitable Circulation”, *Speed and Politics* by Paul Virilio, (1994): 20

⁹⁸ Paul Virilio, *Politics of the Very Worst*, (Semiotext(e), 1999): 89

3.1.3. Abstract Functions

In Benjamin Bratton's terms, the constituents of architectural practice taken as functions are destined to create accidents.⁹⁹ Assume that the diagram which designs the relation between the function and accident represents the space.¹⁰⁰ Then, the manual as in the form of a diagram reflects the strategical thinking, not only demonstrating the actions to be taken but also highlights mobilities and stabilities based on the function of the space. As the inscriptions of action become the diagram, the arrangement of spatial relations addresses the frame in military architecture.¹⁰¹

Caché suggests three types of action in the framing of architecture. His diagrammatic unfolding starts with the separation.¹⁰² The frame segregates territories with the introduction of architectural elements. These segregated territories present multiple combinations of forces and vectors. At the second type of action, abstract function of the frame makes selections among those forces and vectors. As such, the technique that re-relates the architectural object to the site is utilized with a selective manner. The third, and the last action, the elimination of the obstacles concludes the enclosed space. The architectural outcome defines an object -together with its landscape- that is separated from the territory yet connected to it and can be operated upon which, in fact, very much fits with the architecture of bunkers when analyzed within the military space. Hence, the following pages focus on bunkers by using actions of separating, selecting and eliminating.

⁹⁹ Op.cit. Benjamin Bratton, 19

¹⁰⁰ Stan Allen, "Diagrams Matter", *Any*, Vol 23, (1998): 17

¹⁰¹ Ibid.

¹⁰² Op.cit. Bernard Cache

3.1.3.1. Separating and Enclosing

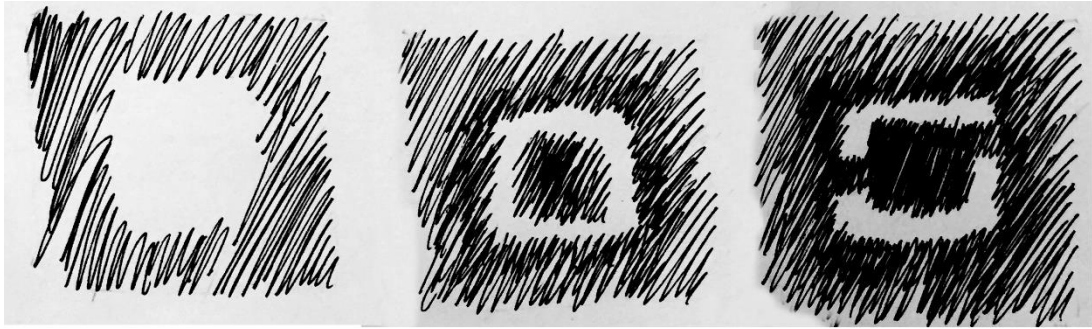


Figure 3.1 Diagrammatic plan sequel, hollow image of bunkers, Source: author

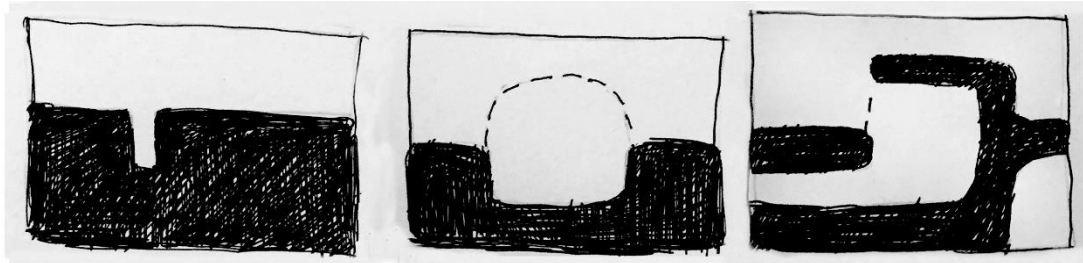


Figure 3.2 Diagrammatic section sequel, hollow image of bunkers, Source: author

The separation of territory and reterritorialization processes can be summed up in two main stages of operations. Starting with the separation of interiors and exteriors from the land, the bunker distinguishes itself on its “hollowness”.¹⁰³ (Figure 3.1.) (Figure 3.2.) Virilio, in his book *A Landscape of Events*, discusses the dematerialization of the war equipment and he observes a change of aspects in *vectors, movements, and positions*.¹⁰⁴ Although these observations were made by comparing the old and new techniques of warfare - from muscular power to nuclear, - they still give hints about the formation of the architecture.¹⁰⁵ He highlights the changes in vectors of weapon

¹⁰³ Eyal Weizman, “Frontier Architecture”, *Hollow Land: Israel’s Architecture of Occupation*, (Verso, 2007): 15

¹⁰⁴ Paul Virilio, *Immaterials of War, A Landscape of Events* (MIT Press, 2000): 82-83

¹⁰⁵ *Ibid.* 86

systems, movements of the fluxes and positions in the structures, all of which evolves into an immaterial condition.¹⁰⁶ In the pursuit of depicting this condition, the image of hollowness needs further discussion. This hollow image can be described as the framing of instances in which forces and inflections create bunkers. In that case, the hollow image of the bunker depicts certain characteristics like “mobile”, “deceptive” and “repellent”.

Bunkers are spread around the inflected territory. Every bunker on the site is assigned to control two percepts. Firstly, there is the assignment relating to the operations around the “exteriorities”.¹⁰⁷ These operations expose the interior territory to be defended. The exterior territory in which forces are nurtured surrounds the interior. If the function of the bunkered landscape is considered as an enclosing act, the territorialization can be distinguished as intrinsic relation between the exterior and the interior. However, this *constructed* territory alters into two distinct exteriorities and an interior. The interiority of bunkered landscape is composed of actions and events about the control of the surroundings. With the function of separation, in other words, the *walling* the interior territory is constructed upon a directing the forces of one exterior towards the other.

Second assignment of the interior is to prepare a spatial organization that holds energies. The flux of good and material deposited inside the interiors of the bunkered landscape.¹⁰⁸ This assignment is about the form of the interior and its palpable qualifications. The bunkered landscape does not represent an impermeable image, in fact, it depicts a highly porous environment.¹⁰⁹ This permeability is one of the framings emerging from the effect of the space created by the firepower, which will be further discussed in the following section about selection. The spatial organization that holds the energies permit this *illusion* of permeability, yet interiors with energies

¹⁰⁶ Ibid. 86

¹⁰⁷ Op.cit. Benjamin Bratton, 19

¹⁰⁸ Op.cit. Paul Virilio

¹⁰⁹ Op.cit. Paul Virilio

do not only create ‘trajectory space’ but also propel a mobility. (Figure 3.3., Figure 3.4.)



Figure 3.3 Vertical movement of the bunkers, Photographed by author on 05/2019



Figure 3.4 Horizontal movement of the bunkers, Photographed by author on 05/2019

The types of movements during the separation phase are the actions of gathering, fabricating and distributing -all of these shape interiorities of the bunkered landscape. The result is real, depicting a virtual space, waiting to be actualized. To sum up, the abstract function of separation while framing the image of bunkers must be inspected with keeping two major components of demarcation processes, in the introduction of the new interiority and its deceptive character pursued by directing the exteriorities towards each other. This assessment can be better analyzed by zooming into an individual bunker.

The *new* territory introduced by a collection of bunkers is under the effect of a ‘disintegration’. The fortification wall that refracts outer forces has changed when it possesses a durability to hold what it is against, the firepower. Before picking out a single bunker it is significant to remind that one of the possible outcomes of enclosing had become slowly dispersed during the emergence of bunkers. The actual construction of the bunkers as the main constituent of frontier architecture, started to crystallize above the nodes of circulation routes. It is necessary to state that these

structures were not part of a walling technique at the time, nor a strategical concern.¹¹⁰ In fact, these partial shelters were born out of a necessity to protect the heavy infantry, being the most significant furnishing of the battlefield. As such, the battle, itself, helped the war-machine to improvise and produce new techniques and the ‘traditional wall gets dispersed as bunkers under the earth. This new technique can be reconfigured to indicate the bunker’s deceptive character.

The design processes of bunkers support this deceptive character by making them unperceivable. This process must be differentiated from the artistic exploration of hiding military premises with camouflage.¹¹¹ Although several bunkers are painted with camouflage helping them to resemble the surrounding milieu, what makes the inserted territory deceptive can be displayed with a theorization of mobility of architecture of bunkers. This mobility is different from the movements of kinetic architecture. Rather the movement of bunkers relies on the time interval between past frontier architecture and present. Therefore, architecture of bunkers must be displayed as other than a stable a fixed barrier. The design processes made bunkers produces ‘mobile’ architectural element. This mobility can be defined with its relation to speed.¹¹² When focused on bunker itself, it is fixed and can be fitted in various environments. Within the changing environment, bunkers make two types of movements according to their axis. The first movement is vertical. (Figure 3.3.) Compared to the movement of the soil, which is a secondary motion, the movement of bunkers are faster in speed and it is established in its position to the surrounding terrain.¹¹³ This relation points out a deliberate operation. By moving towards the center of the earth architecture of bunker dissects the ground.¹¹⁴ Therefore, the interiority of the bunkered landscape can be interpreted by the changes of speed and its regulations. (Figure 3.5.) As regulations operate, bunker moves vertically to the

¹¹⁰ Op.cit. Paul Hirst

¹¹¹ See: Douglas Garofalo, “The Camouflage House”, *Assemblage*, no: 21, (1993): 74

¹¹² Op.cit. Paul Virilio, Bunker Archeology

¹¹³ Ibid.

¹¹⁴ See: Anthony Vidler, “Spatial Violence”, *Assemblage*, no: 20, 1993

ground. This speed slows down with the crystallization of the bunker, but as the earth moves around the structure, it keeps this operation.¹¹⁵ At last, the bunker architecture acts in unison with the regulations and operations of the earth, which leads to its second movement, of the dispersion.

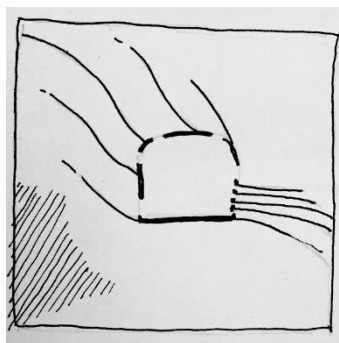


Figure 3.5 Diagrammatic section of bunkers' vertical movement Source: author

The abstract function of separation does not only mediate the interiority and exteriority of the bunkered landscape but also regulates the geometry of the architectural object. The regulated object is the product of the operations acted upon the territory.

The separation from the territory is done by delimiting the possibilities of encounters.¹¹⁶ Asserted encounters are what trigger the movement of the Wall -such as walls of the Bolayır isthmus. Operations on the frontier walls has made them change the forms. The type of operation represented here can be described not as a destructive but as a multiplying one.¹¹⁷ This multiplication produces various meanings, forms, and representations. Precisely, the form of the wall goes into change under a dispersive effect. The dispersed body of the wall hides into the earth and permits the 'eye of the

¹¹⁵ Referring to the cultural theorist Ryan Bishop's study, Graham dwell on issue of *triumph of the surface* by which drone technology has overcome the problem of visibility of everything above the ground. Later, he states that long after Cold War burrowing of ground architecture has been reinitiated by this new technology. Therefore, the crystallization of bunkers towards the ground has not stopped yet it slows down or speeds up occasionally. Stephen Graham, *Vertical: The City From Satellites to Bunkers*, (Verso, 2016): 286

¹¹⁶ Op.cit. Bernard Cache

¹¹⁷ See: Andrew Herscher, "The Language of Damage", *Grey Room*, no: 70, (2002)

surveyor' to gaze into the horizon. Whether it is inside a bunker or near its location, the surveying eye locates many particles of a wall. Those are the remaining particles from the 'explosion' of the wall which is one of the asserted encounters. The bunker as a particle of a larger body has similar features with the wall in terms of its ability to deflect and refract the forces. A similar relation is created between "bunker mentality" and social landscape, in the book of Critical Art Ensemble, *Electronic Civil Disobedience and Other Unpopular Ideas*:

Times have certainly changed, but the principle of fortification is as deeply engrained in society as ever. In fact, the social landscape itself is little more than a series of bunkers. [...] Times have certainly changed, but the principle of fortification is as deeply engrained in society as ever. In fact, the social landscape itself is little more than a series of bunkers. [...] Bunkers in their totality as spectacle colonize the mind, and construct the micro-bunker of reification, which in turn is the most difficult of all to penetrate and destroy.¹¹⁸

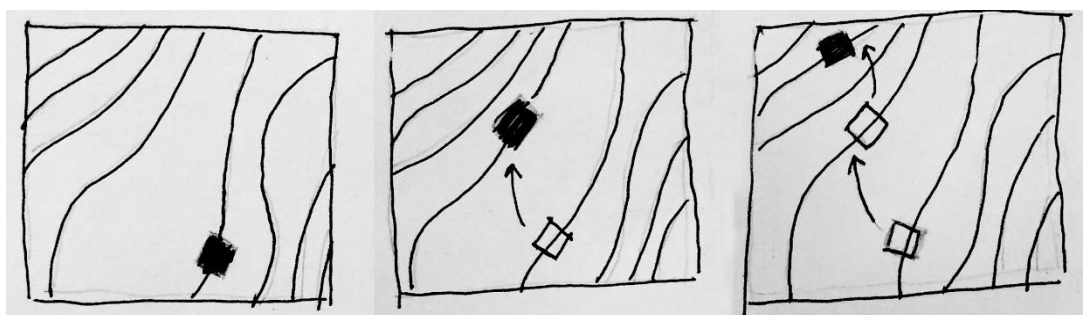


Figure 3.6 Bunker movement in horizontal Source: author

The crystallization of the bunker after the explosion starts with its internal organization. With this organization, bunker gain a repellent character. This character does not emerge from its stability and strength against bombardments, rather from an

¹¹⁸ See: Critical Art Ensemble, *Electronic Civil Disobedience and Other Unpopular Ideas*, "Resisting the Bunker" (1995): 36-37

arrangement that makes it move and have a direction.¹¹⁹ Firstly, the dispersion of the wall manifests the movement of its particles. The particles in the bunkered landscape are the hollow images before the construction.¹²⁰ The hollow image is a drifting body without a shell, wandering the land with no orientation. Later, forces are condensed between inflecting points to locate the particles. The condensations of forces actualize in multiple locations with different magnitudes and directions. The horizontal movement of the hollow image grants the bunker an ability to emerge in multiple locations regarding its movement on a vertical axis. It can drift away from any exterior condition by changing locations with an effort of regulating an interiority.¹²¹ The conditions in which separated territories take shape simultaneously alters the interiors of the bunker. With the introduction of a direction, the substance is deposited around the hollowness. So that, the crystallized form stays intact against the flow of energies based on this orientation.¹²²

There are two ways to inspect the issue of orientation in the bunkered landscape. Firstly, the angles of the inner bunker space can be studied. Walls of individual bunker appear to have distinct angles between them. There are several examples that a perpendicular orientation becomes prominent. While front façade can be defined with the allocation of the openings, the rear part distinguishes itself with the entrance. One can spot a number of openings and entrances, yet it will be convenient to focus on an example with one of each. Frontal and rear parts are in alignment according to the movement of the hollow image.¹²³ As the flux is reestablished by the movement, hollow image is situated on an inflecting point. Being the main constituent of the inflection point, the hollow image of the particle rests between aligned planes. Although the front and rear facades of bunkers are oriented in this fashion, the sides are established to create an acute angle towards the front. The final product of such

¹¹⁹ Sharon Rothbard, "Wall and Tower", *Principles of Frontier Geography*, (Birkhauser, 2006): 108

¹²⁰ Op.cit. Paul Virilio, *Bunker Archeology*, 44

¹²¹ Ibid. Paul Virilio, 37

¹²² Ibid. Paul Virilio, 46

¹²³ Ibid. Paul Virilio, 46

geometrical positionings of planes folds the land and deposits the particles forming the bunker. (Figure 3.7.)



Figure 3.7 The architectural element of separation, the walls of the bunkers, Photographed by author on 05/2019

With the function of separation, the bunker becomes a space that is operated to inflect the forces by repelling, refracting or depositing for later use. It is functionalized with a mission of dispersion through the land. Such a dispersion creates a deceptive perception of the environment that seems remarkably permeable. However, the bunkered landscape becomes impermeable since bunkers have directions from which they channel the deposited energies. The act of channeling can be further examined with second abstract function which selects the vectors and points to be framed.

3.1.3.2. Selecting and Opening

The crystallization of separated territories in bunkered landscape concludes itself with the channeling of energies. The bunker as it is fitted to inflecting points redirects the flux. The framing of the image of bunkers is improved with the selection of assorted encounters of the territory and the flux.¹²⁴ When a hollow image of a bunker is oriented

¹²⁴ Op.cit. Bernard Cache

between two territories, it starts to operate with the framed encounters. It is important to note that those encounters are made of inflictions and forces of the territory. In order to select, first, it is necessary to understand how the mechanism of a bunker becomes operational on the territory. After separating the territories, the interiority of the bunkered landscape is filled with the flying munition. The flights of those objects designate a spatial organization. This organization is nestled in the base of control mechanisms and their architecture.



Figure 3.8 The architectural element of selection, the openings of the bunkers, Photographed by author on 05/2019



Figure 3.9 The architectural element of selection, the view from the openings, Photographed by author on 05/2019

There is a *dialectic* between architectural form and territorial control mechanisms, which is fed with the collisions of forces. This collision gives birth to the engineering of spaces.¹²⁵ The endless deliberations and calculations highlight a practice of

¹²⁵ Keller Easterling, "Subtraction", *Perspecta*, Vol 34, (2003): 63

architecture revolving around the science of industrialization, changes of the forms and techniques of defense architecture. The techniques of creating trajectories reproduce the factors of space-making via the emergence of the vectors of destruction.¹²⁶ Upon declaring the factors of which subtractive vectors, there is a trajectorial plane which is outlined by the orbits of weaponry, covering the surface of the land, deploying (de-deploying/re-deploying) the architecture.¹²⁷ This plane is actually a projection of a spatial arrangement to the ground. Moreover, there are several examples in which the effects of its representation change the strategies of attack and defense. This was even an issue in the first century BC, when Vitruvius advised on the trajectory of an archer's arrow in order to locate the positions of guarding posts.¹²⁸ The effective distance that a trained archer can reach was, then, doubled to trace out the locations of the towers. Therefore, a basic notion of defense was obtained by confirming that the ellipse of every fortification draws by its hardware must be tangent to the others.¹²⁹ In many other examples, conditions that gave shape to fortification were under the effect of this effective distance.

The reasons why Vitruvius proposed round-shaped towers for the defense becomes clear with the introduction of the impact.¹³⁰ Siege machines and cannons can easily break the corners, making the walls vulnerable to destruction.¹³¹ Therefore, the space of the trajectory, in other words, the destructive space, in which two of the three stages -flight and impact- happens is where one can ask questions regarding the morphology. The bunker was under the effect of the space of trajectory. However, the impact which they were designed to counter was many times stronger and more precise. This precision and strength of these forces needs further explanation.

¹²⁶ Manuel De Landa, *War In the Age of Intelligence Machines*, (MIT Press, 1991): 34

¹²⁷ See: Yusuf Acioğlu, Gallipoli Maps of Redoubts.

¹²⁸ Vitruvius, "Book I", *Ten books of Architecture*, trans. Morris Hicky Morgan, (Harvard University Press, 1914): 21

¹²⁹ Ibid. Vitruvius

¹³⁰ Ibid. Vitruvius

¹³¹ Ibid. Vitruvius

Manuel De Landa, in his book “*War in The Age of Intelligent Machines*”, explains the three stages of firearms during its creation of a trajectory.¹³² In the “propulsion stage”, a projectile is part of all the actions before its flight. These actions include all types of energy-consuming mobilities -production, transportation, storage, etc.- till the projectile leaves the barrel.¹³³ Secondly, “ballistic stage” encompasses the events during the creation of the path, that is, the trajectory of the projectile.¹³⁴ In the same chapter, De Landa establishes a connection between the effectuality of the self-organizing character of a warzone -such as weather, chemical reactions, geography, and the higher levels of complexity that governs the economy of the battlefield -such as organizations, strategies, tactics, etc.¹³⁵ By the creation of this connection, one can understand that the route of a munition is under the effect of both unexpected possible events and *to-be-fulfilled* commissions. Lastly, De Landa focuses on the form of the assault -its magnitude, area of effect, reaction to environment or body, etc.- and named it as the “impact stage”.¹³⁶

Realizing the fact that these three stages of offense technology determine spatial relations to make the ignition, flight and destruction convey the first hint of imminence to architecture. From the propulsion to the destination all the processes are hereditary to their former spaces. Moreover, the author later associates the technologies behind the impact stage with the erection of defense architecture, which leads to the second definition of space in relation to the firearms.¹³⁷ The latter emerges with a simple definition of trajectory, that is the route. Apart from its spaces of production at macroscale and spaces of ignition at the microscale and finally the spaces of destruction, the projectile defines a space by the geometry of its path. The in-between

¹³² Ibid. Manuel De Landa, 24

¹³³ Ibid. Manuel De Landa, 25, 29, 34

¹³⁴ Ibid. Manuel De Landa, 35

¹³⁵ Ibid. Manuel De Landa, 9

¹³⁶ Ibid. Manuel De Landa, 47

¹³⁷ “From Newton on, the main mathematical tool available for the study of missile trajectories was the differential calculus. Partly under military pressure, the operators of the calculus (that is, differentiation and integration) became embodied in physical devices.” Ibid. Manuel De Landa, 41

space emerges in what De Landa refers to as a ballistic stage.¹³⁸ Being part of the strategic level of warfare, defensive architecture takes place inside the trajectorial space and constitute its form at the same time. At this point, it is important to question how bunkers achieve a merged space of trajectories and are shaped under the effect of this space.

Recordings of projectile that is engineered to travel a distance in the probable interval would initiate the 2D mappings that are composed circular planes.¹³⁹ The flight of a munition draws parabolas both in the section and the planar dimension. The space created within the boundaries of the planar projection of its maximum reaching area of a munition, becoming the bottom and the trajectory of the munition its section will be named as 'trajectory space'.¹⁴⁰ Then this in-between space is multiplied with several munition and exists with the combination of several flight routes with various destinations simultaneously -or diachronically.

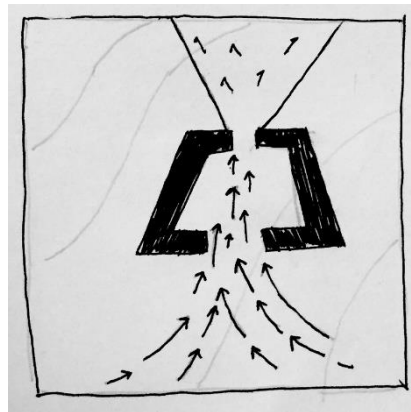


Figure 3.10 Diagrammatic plan, channeling and trajectory space Source: author

¹³⁸ In the same sense Virilio also highlights the field that firearms act as part of strategic forces. Rather than stating it as a field the space of firearms would provide the base for investigating its effect on architecture. 'Like the recoil of a firearm, the implosive movement of the ballistic performances diminishes the field of strategic forces.' Ibid. Paul Virilio, *Speed and Politics*, 161

¹³⁹ Jean-Marc Offner, Agnès Sander, Paul Virilio, "For a geography of trajectories: An interview with Paul Virilio", *In: Flux*, no 5, (1991): 48-54

¹⁴⁰ Ibid.

3.1.3.3. Elimination and Surfacing

After the separation is completed and function of selection reintroduces vectors and inflection points into the image, the constitution of the frame can be overcome by eliminating the obstacles.¹⁴¹ As limiting the vectors and movements helps bunkered landscape to finalize its position. Later, bunkered landscape crystallizes when it sorts out the channeling of fluxes. The three stages of this channeling, propulsion, flight, and impact, signals another function of the bunkered landscape: to create a space of performance.¹⁴² After changing directions of the fluxes, the bunkered landscape is finalized with the elimination of disturbances which might affect the performances. In order to frame the architectural image, it is necessary to depict a type of performance and a set of disturbances.

The performance in competitive environments starts with narrowing down the “objectives”.¹⁴³ The objectives are rendered within the “limited” and “selected” events that occur in accordance with perceptions.¹⁴⁴ The *event-space* of architecture is activated by the movement of bodies¹⁴⁵, informed by the objectives.¹⁴⁶ If a body

¹⁴¹ Op.cit. Bernard Cache, *Earth Moves*, 25

¹⁴² Caché proposes that a smoothing operation enables events to take shape in a space. This attitude towards the activity in architecture can be reshaped within bunker study. Although bunker architecture contains flatted and smoothed geometrical elements, the interiority of bunkered landscape is consisted of non-linearities. Therefore, the types of eliminations in two contexts have systematic differences. Ibid.

¹⁴³ Jillian Crandal, “Transgressing the Limits: Performance and Sentient Event”, *Thresholds*, no 42, (2004): 155

¹⁴⁴ Crandal introduces kinesthetic, auditory and visual perception which emphasizes the basics of cognitive abilities of a belligerent. However, this text does not make a reading of sense-perception, in fact, it tries to convey an understanding of a “perception” between bodies of information and masses. Ibid. Jillian Crandal

¹⁴⁵ The intention of using the word “body” is to refer belligerents, unlike former usages which meant architectural body, or mass. Surprisingly, a body of a belligerent, sometimes is no different than a simple mass in military space. See, 300, Directed by Zack Synder, Scene: Wall of Human, USA, 2007

¹⁴⁶ In an interview of Bernard Tschumi refers to his own studies of architecture and its relation to activities. He dwells on the notion of events in space rather than the term “performance”. He claims that the architecture is “defined by the movement.” According to Tschumi, the embodiment of space is formed with series of perceptions that takes place during the movement. His way of relating cinema and architecture provides a distinct relation between the framings and the space. The materialization of concepts takes place in architecture within which events can be shaped.

travels from A to B, its objective is to find a path leading to B starting from A. The objective is narrowed within the points between A and B through movement. It might require a return back to point A or getting away from point B as the path continues, it does not mean it is not proceeding. As Tschumi puts, it is part of the architecture that is a complication of heterogeneous definitions in space, events, and movement.¹⁴⁷ In that, the performance is the combination of movements. Therefore, the performance of an objective can vary in multiple ways in relation to perceptions. Any intervention to the continuity of the perceptions would disrupt the performance.

The disturbances in the bunkered landscape can be examined by looking at the surfaces. Firstly, the elimination of the exterior surfaces can be read through the trajectory space. The disturbances that emerge inside the trajectory space are caused by the munitions in the impact stage. These disturbances affect the tectonics of the hollow body. The hollow body, then, is designed to reflect the munition in the impact stage. Therefore, the munition skips this stage and continues with the flight stage. However, the munition transfuses a part of its energy and change direction. The hollow body, then, transforms with the introduction of a new force. This force engineers the body to reflect every possible drive. Sometimes it has cornered edges and in some other cases bunkers appear to have a circular body. (Figure 3.11)

Dorita Hannah, Omar Khan and Bernard Tschumi, "Performance/Architecture: An Interview with Bernard Tschumi", *Journal of Architectural Education*, Vol 61, No 4, (2008): 52-53

¹⁴⁷ Ibid, Bernard Tschumi



Figure 3.11 The architectural element of elimination, the surfaces of the bunkers, Photographed by author on 05/2019

Secondly, there is the compatibility issue between the surfaces of the hardware and the interiors of the bunker. The elimination occurs between weapons and slabs. The hollow body is constituted of surface which permits circulation and structural stability both inside and outside. However, performance can be displayed with the continuation of stable conditions for the continuation of firepower. The surfaces of the hardware are pulled by gravitational concrete forces inside the bunker. This continuation enables the hollow body to insert them as part of the crystallization process. As well as niches are carved to stabilize, the empty shells are gathered in pits for the continuation of firepower and circulation of the flux. (Figure 3.12.)



Figure 3.12 The architectural element of selection, dent and bent surfaces for the hardware Photographed by author on 05/2019

The interiors of the bunkered landscape are also under the effect of elimination. The pathways between bunkers are designed to preserve the circulation. Having been positioned on top of fluxes, bunkers have the opportunity to deploy entrenchments between them. Additionally, there are some examples of tunnels that connect bunkers.

CHAPTER 4

SURVEY OF BUNKER ARCHITECTURE



Figure 4.1 Bolayır, Demirtepe and Kavakköy districts on the isthmus.

During the study of this text, two surveys have been conducted in April 2018 and in April 2019. The first one was carried out between 14-15-16th April. The aim of this survey is to swipe the peninsula and discover the feasible sites for the study and make a general deduction of architectural qualities. As the outcome of this investigation, 32 bunkers were photographed, geolocated and mapped. They were on display during the proposal presentation of the thesis. First, western shores of Kuko Range and inner parts of Bolayır Isthmus were visited. The shoreline is located around Yeniköy and Güneyli regions. Nine *coastal* bunkers are located in smaller bays within approximately 150 meters distance between each.¹⁴⁸ In addition to them, one was

¹⁴⁸ Coastal bunker is specified as a type. However, they do not demonstrate any particular feature to be named “coastal” rather than being next to the sea. Therefore, during this study such kind of nomenclature is avoided.

located near Demirkavak. Other 22 of the encountered bunkers were located around the isthmus.

After the first survey, the second one has sought for further information and detail. It was carried out between 23rd of April and 2nd of May. The aim of this study is to bring out a typology of bunkers, their relation to surroundings and terrain, their general condition and their documentation in a specific site. The territory of Bolayır isthmus is selected as a case since its capacity of producing frontier architecture has been proven throughout history. Districts of Demirtepe, Kavakköy, and Bolayır are scanned. (Figure 4.1.) More than 160 structures have been spotted which are thought to be related to the defense of the territory. However, only 80 of them were documented, due to legal and geographical restrictions. Documentation have been made using interior and exterior photographs, geolocations, partial relief drawings of the interior and exterior surfaces, entrances, wall thicknesses and openings. (See Table 1, 2, 3, 4, 5)

Table 4.1 Table of diagrammatic plans, geolocations and types, between no 1 – no 16

















<p>Bunker No 1</p> <p>Lt: 40,5874 Ln: 26,8724 A: 60 m T: 3</p> 	<p>Bunker No 2</p> <p>Lt: 40,6167 Ln: 26,8989 A: 40 m T: 1</p> 	<p>Bunker No 3</p> <p>Lt: 40,3700 Ln: 26,5357 A: 40 m T: 1</p> 	<p>Bunker No 4</p> <p>Lt: 40,3559 Ln: 26,5260 A: 10 m T: 4</p> 
<p>Bunker No 5</p> <p>Lt: 40,3543 Ln: 26,5147 A: 30 m T: 2</p> 	<p>Bunker No 6</p> <p>Lt: 40,3540 Ln: 26,5245 A: 30 m T: 2</p> 	<p>Bunker No 7</p> <p>Lt: 40,3546 Ln: 26,5115 A: 30 m T: 2</p> 	<p>Bunker No 8</p> <p>Lt: 40,3542 Ln: 26,5212 A: 20 m T: 5</p> 
<p>Bunker No 9</p> <p>Lt: 40,3541 Ln: 26,5225 A: 30 m T: 3</p> 	<p>Bunker No 10</p> <p>Lt: 40,3539 Ln: 26,5229 A: 30 m T: 2</p> 	<p>Bunker No 11</p> <p>Lt: 40,3537 Ln: 26,5145 A: 30 m T: 2</p> 	<p>Bunker No 12</p> <p>Lt: 40,3536 Ln: 26,5231 A: 30 m T: 2</p> 
<p>Bunker No 13</p> <p>Lt: 40,3533 Ln: 26,5214 A: 40 m T: 3</p> 	<p>Bunker No 14</p> <p>Lt: - Ln: - (near No 10) A: 30 m T: 2</p> 	<p>Bunker No 15</p> <p>Lt: - Ln: - (near No 10) A: 30 m T: 2</p> 	<p>Bunker No 16</p> <p>Lt: 40,3538 Ln: 26,5142 A: 20 m T: 2</p> 

Table 4.2 Table of diagrammatic plans, geolocations and types, between no 17 – no 32















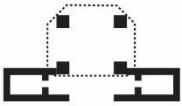
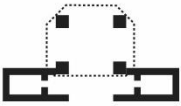
<p>Bunker No 17</p> <p>Lt: 40,3545 Ln: 26,5125 A: 20 m T: 1</p> 	<p>Bunker No 18</p> <p>Lt: 40,3538 Ln: 26,5145 A: - T: 1</p> 	<p>Bunker No 19</p> <p>Lt: 40,3509 Ln: 26,5220 A: 50 m T: 2</p> 	<p>Bunker No 20</p> <p>Lt: 40,3512 Ln: 26,5212 A: 80 m T: 2</p> 
<p>Bunker No 21</p> <p>Lt: 40,3509 Ln: 26,5211 A: 70 m T: 2</p> 	<p>Bunker No 22</p> <p>Lt: 40,3511 Ln: 26,5212 A: 70 m T: 2</p> 	<p>Bunker No 23</p> <p>Lt: 40,3511 Ln: 26,5212 A: 60 m T: 1</p> 	<p>Bunker No 24</p> <p>Lt: 40,3450 Ln: 26,5056 A: 60 m T: 3</p> 
<p>Bunker No 25</p> <p>Lt: 40,3453 Ln: 26,5056 A: 40 m T: 3</p> 	<p>Bunker No 26</p> <p>Lt: 40,3456 Ln: 26,5056 A: 30 m T: 3</p> 	<p>Bunker No 27</p> <p>Lt: 40,3507 Ln: 26,5108 A: 30 m T: -</p> 	<p>Bunker No 28</p> <p>Lt: 40,3504 Ln: 26,5049 A: 30 m T: 3</p> 
<p>Bunker No 29</p> <p>Lt: 40,3504 Ln: 26,5046 A: 10 m T: 2</p> 	<p>Bunker No 30</p> <p>Lt: 40,3518 Ln: 26,5118 A: 10 m T: 3</p> 	<p>Bunker No 31</p> <p>Lt: 40,3152 Ln: 26,5127 A: 70 m T: 6</p> 	<p>Bunker No 32</p> <p>Lt: 40,3213 Ln: 26,5135 A: 90 m T: 6</p> 

Table 4.3 Table of diagrammatic plans, geolocations and types, between no33 – no 48













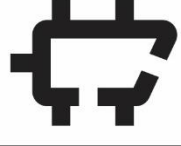


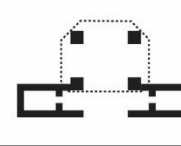
<p>Bunker No 33</p> <p>Lt: 40,3048 Ln: 26,4821 A: 80 m T: 3</p> 	<p>Bunker No 34</p> <p>Lt: 40,3060 Ln: 26,4811 A: 80 m T: 3</p> 	<p>Bunker No 35</p> <p>Lt: 40,3061 Ln: 26,4811 A: 70 m T: 3</p> 	<p>Bunker No 36</p> <p>Lt: 40,3061 Ln: 26,4812 A: 70 m T: 3</p> 
<p>Bunker No 37</p> <p>Lt: 40,3118 Ln: 26,4746 A: 90 m T: 3</p> 	<p>Bunker No 38</p> <p>Lt: 40,3117 Ln: 26,4736 A: 70 m T: 3</p> 	<p>Bunker No 39</p> <p>Lt: 40,3117 Ln: 26,4743 A: 90 m T: 3</p> 	<p>Bunker No 40</p> <p>Lt: 40,3118 Ln: 26,4745 A: 90 m T: 3</p> 
<p>Bunker No 41</p> <p>Lt: 40,3117 Ln: 26,4759 A: 90 m T: 3</p> 	<p>Bunker No 42</p> <p>Lt: 40,3117 Ln: 26,4759 A: 30 m T: 3</p> 	<p>Bunker No 43</p> <p>Lt: 40,3044 Ln: 26,4636 A: 20 m T: 5</p> 	<p>Bunker No 44</p> <p>Lt: 40,3044 Ln: 26,4636 A: 20 m T: 2</p> 
<p>Bunker No 45</p> <p>Lt: 40,2922 Ln: 26,4617 A: 10 m T: 8</p> 	<p>Bunker No 46</p> <p>Lt: 40,2932 Ln: 26,4606 A: 10 m T: 2</p> 	<p>Bunker No 47</p> <p>Lt: 40,2938 Ln: 26,4635 A: 10 m T: 5</p> 	<p>Bunker No 48</p> <p>Lt: 40,3005 Ln: 26,4236 A: 110 m T: 6</p> 

Table 4.4 Table of diagrammatic plans, geolocations and types, between no 49 – no 64








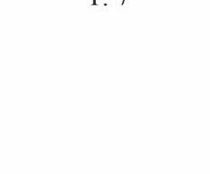



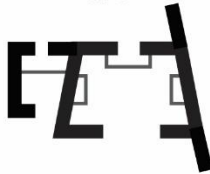




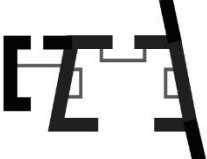












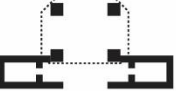
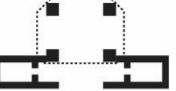

<p>Bunker No 49</p> <p>Lt: 40,3003 Ln: 26,4236 A: 90 m T: 6</p> 	<p>Bunker No 50</p> <p>Lt: 40,3202 Ln: 26,4237 A: 80 m T: 6</p> 	<p>Bunker No 51</p> <p>Lt: 40,2923 Ln: 26,4148 A: 90 m T: 6</p> 	<p>Bunker No 52</p> <p>Lt: 40,2942 Ln: 26,4209 A: 90 m T: 6</p> 
<p>Bunker No 53</p> <p>Lt: 40,2942 Ln: 26,4210 A: 90 m T: 6</p> 	<p>Bunker No 54</p> <p>Lt: 40,2942 Ln: 26,4211 A: 90 m T: 6</p> 	<p>Bunker No 55</p> <p>Lt: 40,2917 Ln: 26,4244 A: 100 m T: 3</p> 	<p>Bunker No 56</p> <p>Lt: 40,3014 Ln: 26,4251 A: 110 m T: 7</p> 
<p>Bunker No 57</p> <p>Lt: 40,3038 Ln: 26,4304 A: 70 m T: 3</p> 	<p>Bunker No 58</p> <p>Lt: 40,3039 Ln: 26,4310 A: 70 m T: 3</p> 	<p>Bunker No 59</p> <p>Lt: 40,3112 Ln: 26,4538 A: 20 m T: 2</p> 	<p>Bunker No 60</p> <p>Lt: 40,3115 Ln: 26,4536 A: 20 m T: 3</p> 
<p>Bunker No 61</p> <p>Lt: 40,3115 Ln: 26,4556 A: 80 m T: 2</p> 	<p>Bunker No 62</p> <p>Lt: 40,3118 Ln: 26,4604 A: 60 m T: 2</p> 	<p>Bunker No 63</p> <p>Lt: 40,3115 Ln: 26,4602 A: 60 m T: 2</p> 	<p>Bunker No 64</p> <p>Lt: 40,3119 Ln: 26,4605 A: 60 m T: 2</p> 

Table 4.5 Table of diagrammatic plans, geolocations and types, between no 65 – no 80

<p>Bunker No 65</p> <p>Lt: 40,3119 Ln: 26,4451 A: 100 m T: 3</p> 	<p>Bunker No 66</p> <p>Lt: 40,3119 Ln: 26,4451 A: 100 m T: 3</p> 	<p>Bunker No 67</p> <p>Lt: 40,3029 Ln: 26,4438 A: 110 m T: 3</p> 	<p>Bunker No 68</p> <p>Lt: 40,3020 Ln: 26,4419 A: 120 m T: 2</p> 
<p>Bunker No 68</p> <p>Lt: 40,3021 Ln: 26,4421 A: 110 m T: 2</p> 	<p>Bunker No 70</p> <p>Lt: 40,3017 Ln: 26,4415 A: 100 m T: 2</p> 	<p>Bunker No 71</p> <p>Lt: 40,3015 Ln: 26,4415 A: 110 m T: 2</p> 	<p>Bunker No 72</p> <p>Lt: 40,3013 Ln: 26,4414 A: 120 m T: 2</p> 
<p>Bunker No 73</p> <p>Lt: 40,3012 Ln: 26,4412 A: 130 m T: 2</p> 	<p>Bunker No 74</p> <p>Lt: 40,3039 Ln: 26,4310 A: 100 m T: 3</p> 	<p>Bunker No 75</p> <p>Lt: 40,3019 Ln: 26,4409 A: 120 m T: 2</p> 	<p>Bunker No 76</p> <p>Lt: 40,2922 Ln: 26,4336 A: 80 m T: 3</p> 
<p>Bunker No 77</p> <p>Lt: 40,2922 Ln: 26,4336 A: 80 m T: 6</p> 	<p>Bunker No 78</p> <p>Lt: 40,2914 Ln: 26,4346 A: 70 m T: 6</p> 	<p>Bunker No 79</p> <p>Lt: 40,2853 Ln: 26,4347 A: 80 m T: 6</p> 	<p>Bunker No 80</p> <p>Lt: 40,2851 Ln: 26,4349 A: 60 m T: 6</p> 

Most of the encountered bunkers were covered with shrubs and bushes. Therefore, some of them can be hard to distinguish in photographs. Additionally, they will be shown on mappings. Another issue is about defining the types of the bunker and their distinguishing features. Nine types of bunkers have been identified, yet most of the bunkers are site-specific. For this reason, within every example of a type, there is a very large margin of formal differentiation. For example, as well as the thicknesses of walls can vary in the same types, the walls next to the openings can extend in relation to defensive properties which the site introduces.

There are four minor typologies which requires further examination to be identified as a bunker. The first one is B6, which is deployed in closer proximity to each other. This type has an elevated surface on top of rectangular columns. There are no other architectural elements enclosing its volume, instead, it has a lowered base which might give the tenability to the structure. (Figure 4.2.) Next to this space, there are two rectangular structures adjacent to it and facing to each other. (Figure 4.3.) Since they uphold strategic points and supervene with storage units, it is clear that they are related to the defense of the territory. However, this structure can be questioned whether it is a bunker, or it is a mere defense structure.



Figure 4.2 Bunker Type 6, front façade photo, Photographed by the author in 1/5/2019



Figure 4.3 Bunker Type 6, rectangular structure, Photographed by the author in 1/5/2019

There is another type of structure, B7, which raises similar questions with B6. This structure is also considered to be a part of the defensive measurements in the territory. Unlike B6, B7 defines a space with the enclosure of the walls which are located below ground level. From the planar view, it resembles a “T” shape of which two entrances are on the wings. Descending is provided with deck ladders, made of steel bars and closed with 20 cm thick concrete lids. Having no openings and being buried underground imply that this structure is designed for storage purposes. (Figure 4.4.)



Figure 4.4 Bunker Type 7, top view photo, Photographed by the author in 1/5/2019

Whether those two types are bunkers or not can be grasped by examining the effects and traces of abstract functions creating them. To answer the question about its attendance in the operation of separation, it is necessary to demonstrate the vectors in play, its mobile hollow body and its position in the territory. For example, B7 is a part of the interiority of the bunkered landscape for certain. The vectors are parallel with gravity. With its buried body, it has a hidden spot. Its crystallization has stopped at the ground level. Therefore, it seems that it does not have a role in selecting vectors. However, it can still partake in creation of trajectory space by depositing energy for near bunkers. With keeping multi-story bunker examples in mind, these types can merge with others to support them during the deployment of trajectories. For B6, not only separation but also selection affects its condition. However, this selection is operated on wide angles with extended trajectory spaces. In this respect, both of them serves the defense of the area with taking part in the creation of trajectory space and separation of the territory, although they resemble ‘incomplete’ versions of bunkers.

Other bunker types had one particular example of each. B8 had a trapezoid plan with beveled corners. Having two buttresses on each side and one on the rear façade, a total of five buttresses support its structure from the outside. It is also located between trench lines. B9 is one of the most complex examples. Due to its location in a private

property, only two façades were photographed. The upper part of this type consists of two cones and a prism connecting them. A cone is connected to the cylinder while making eaves at the finish. Considering the openings of the cylindric part, this bunker must have been designed to monitor a respectively large area.

4.1. Five Bunker Types in Particular

Five bunker types stand out with their interrelations to each other. They can be classified under two groups according to their role in creating spatial organization. While B1 and B2 combine to create B3, B4 split up to create B5. The formal descriptions of the types will be studied with dimensions and organizations of the space.

4.1.1. B1, B2 and B3

The description of B1 type is based on a specific example. It is a bunker near Şarköy road in Kavakköy. Even though every deployment of bunkers is related to the site-specific conditions and requires a survey of its own, they display similar agendas within their typology. To begin with, B1 resembles a trapezoid shape from a planar view. The terrain ripples on each side of the bunker, making a hill made of rubbles. (Figure 4.5.) Its entrance is located on the longer edge and opening is on the short. The façade with the entrance measures 670 cm in length and 180 cm in height, making the ceiling height lower than a standing person. Entrance is located in the middle of the façade and measures 200 cm to 100 cm. (Figure 4.6.) Therefore, one needs to slide or crawl to get inside. Terrain subsides with the lateral façades, leaving rear façade halfway burrowed to the ground. The dimensions of those facades measure 610 cm in length and 250 cm in height. The front façade is 200 cm shorter than the rear. The opening is located in the middle with 150x100 cm dimensions on the outer surface, 130x80 cm in the inner surface. (Figure 4.7.) The thickness of the walls is 50 cm, but

it can reach up to 70 cm in some examples. Occasionally, walls can extend through front façade creating a screen by blocking the vision of the opening. In those examples, slab follows the extension and creates eaves. (Figure 4.8.) Extending wall and eaves become operational both by the function of separation and selection. The sill, on the other hand, eliminates hardware-related problems.



Figure 4.5 Bunker Type 1, side view photo, Photographed by the author on 25/04/2019



Figure 4.6 Bunker Type 1, rearview photo, Photographed by the author on 25/04/2019



Figure 4.7 Bunker Type 1, front view photo, Photographed by the author on 25/04/2019



Figure 4.8 Bunker Type 1, front view photo with eaves and extension, Photographed by the author on 27/04/2019

B2 bunkers are rectangular structures, similar to the organization of B1 but with a smaller dimension. They also have one entrance and an opening and burrowed halfway to the ground. Extending the upper slab and the sidewall also exist in B2 formation. The position of the entrance changes in accordance with the terrain and surrounding bunkers, which can be placed in rear or side façades. (Figure 4.9.) Openings extend to exterior with rectangular concrete blocks. (Figure 4.10.) Wall thicknesses change around 40 to 70 cm depending on the territory. B2 is usually accompanied by other bunkers in irregular formations, or inline. In irregular formations, B2 operates as part of the creating trajectories towards other bunkers. Inline formations, which are usually made with four bunkers in a row, they commissioned to separate and select all the forces of territory. (Figure 4.11.)



Figure 4.9 Bunker Type 2, side view photo with eaves, extension and side entrance Photographed by the author on 27/04/2019



Figure 4.10 Bunker Type 2, side view photo with eaves, extension and side entrance Photographed by the author on 27/04/2019



Figure 4.11 Bunker Type 2, bunkers in line formation, Photographed by the author on 01/05/2019



Figure 4.12 Bunker Type 2, watching the valley, Photographed by the author on 27/04/2019

When they are singled out, they might be positioned to watch the flux of a safer territory. (Figure 4. 12.)

B2 can transform into various forms in relation to the abstract functions on it. There are examples which bunker crystallizes with thicker roofs and beveled edges. These

ones are formed in relation to the function of separation. (Figure 4.13.) They are associated with a stronger repellent character. Their monolithic appearance is gained by aggregating materials into the vertices between gaps. This accumulation operates as part of its function of elimination by smoothing the surfaces. Therefore, surfaces can change the momentum of a particle in the impact stage. During the operation of selection, its opening stretches to the extending wall and to the eaves.



Figure 4.13 Bunker Type 2, with a thick slab, Photographed by the author on 27/04/2019

B3 consists of two types of bunkers. It has the large body of B1 next to B2. It displays a similar relation with the terrain in terms of its movement around the structure. There are two entrances and two openings of the bunker. A wall in-between separates the two spaces of B1 and B2. The spaces are not connected to each other with an indoor passage. Both entrances are oriented in the same direction. (Figure 4.14.) Also, the openings are directed towards the same target area. (Figure 4.15.) The level difference between the slabs can reach up to 90 cm, B2 module being closer to ground.



Figure 4.14 Bunker Type 3, a combination of B1 and B2, entrances, Photographed by the author on 02/05/2019



Figure 4.15 Bunker Type 3, openings, Photographed by the author on 02/05/2019

The addition of two bunkers can be explained with the abstract functions operated on the site. B3 is usually accompanied by several bunkers since it needs a monitoring facility to deploy trajectory space towards its entrances. Its participation in elimination and separation are similar to the roles of its constituents. The contribution that B3 makes in creation of trajectory space is eminent in terms of its capacity. The flux that is channeled from the bunker is rather divided into two. Those two channelings differ in shape and direction while being deployed at the same time. Therefore, this addition is made to empower the channeling of flux or multiply its directionality. Yet, this multiplication lacks angular differentiation. The function of selection is emphasized with the emplacement of B3 type in the bunkered landscape

4.1.2. B4 and B5

B4 type occupies a plot of 14x16 meters with its triangular shape. The upper part of this mass is provided with a thick slab. The lower part resembles “flipped terraces”. On top, there is a triangular mass which is combined with a milled one on the lower part. Rear one being blind, each of the other two sides are assigned with a function of either logistical organization or channeling of energy. B4 has a more complex spatial organization compared to former examples. The plan organization can also be analyzed within their relationship with logistics and creation of trajectory space. To begin with, the circulation inside the bunker is divided between those two functions each with its own entrances. (Figure 4.16.) The subsidiary spaces attend the arrangement of flux that is taken inside the bunker from the smaller entrance. Inside, a narrow corridor connects the depot and two small spaces with openings. (Figure 4.17.) Thus, depot serves to two small spaces. (Figure 4.18.) Entrance and corridor are positioned close to the joint of two façades, facing away from the trajectory space. The openings are assigned to monitor the territory around the bunker. (Figure 4.19.)



Figure 4.16 Bunker Type 4, façade with entrances, Photographed by the author on 25/04/2019



Figure 4.17 Bunker Type 4, hall and corridor, Photographed by the author on 25/04/2019



Figure 4.18 Bunker Type 4, deposit space, Photographed by the author on 25/04/2019



Figure 4.19 Bunker Type 4, openings on front façade, Photographed by the author on 25/04/2019

Same protective measurements are taken on the other side too. There are two openings facing to the terrain in front of entrances. (Figure 4.16.) The openings which do not protect the entrances take larger parts in the creation of the trajectory space. The major contribution to the creation of trajectory space is made from those openings. It seems that the opening facing the front is designed for artillery fire, while the other is for the rifle. They differ in the usage of hardware; their capacity is related to the spaces. Those spaces occupy the larger end of the triangle which is divided into two. There is a connection between those two spaces under which a lower level is distinguished. Additionally, the lintel -beam- can be considered lower than usual. The axis that runs through this connection divides the triangle into two. With this connection, the flux entering from subsidiary parts can circulate between spaces.

The role of B4 in separating the territory is striking. This type is usually emplaced as a free-standing structure on an open field without being buried. The forces that help to crystallize this type do not include gravitational concrete forces. The abstract forces, on the other hand, help it gain its mobility as well as its position. The hollow body drifts the land with a slower speed since the forces either extinguish each other or contribute to its movement. Its position is an outcome of this slow movement. Likewise, the organization of interior spaces required a complexity to control the fluxes with a definitive scheme. This scheme can be observed in B5 type bunkers, too.

B5 has a single functioning façade whose organization resembles of B4's. There are two entrances in similar order to B4. (Figure 4.20.) Similarities between the two can be observed in the plan organization too. It also has a triangular plan. The arrangement of the corridor, the deposit space, and the main hall is highly similar. (Figure.4.21.) This similarity conveys that B5 is a "pruned" version of B4 since it consists half the number of rooms. With this pruning operation, the form of the bunker goes under several changes. Firstly, side façades become blind surfaces. Having one frontal façade means that the flux is channeled with an acute angle. Therefore, its participation in selection is to support other bunkers.



Figure 4.20 Bunker Type 5, the front façade, Photographed by the author on 26/04/2019



Figure 4.21 Bunker Type 4, entrance from the main hall, Photographed by the author on 25/04/2019

CONCLUSION

The territorial image highlights the forces, movements, and positions that are harbored in a milieu. It aims to frame the inflecting points in positionings, the accumulation of forces and fluctuations of movements. Additionally, framing is consolidated by historical data of the past forces, their movements, and inflections. Therefore, it reenacts the relationship between the settling and the terrain by comparing past events, routes, architectures, and their land. Providing strategical and logistical importance to its milieu, Gallipoli promises an interesting profile as a site. The territorial image of the site can be framed with its history of the battle. The concerns for the defendability of the territory focus on several parts of this area throughout history. Four of these locations can be investigated within their realization of a frontier. The realization of possible frontiers varies in forms while changing the relation between architectural qualities and features of the terrain. One specific area deserves more attention among the others since it has hosted two different kinds of the frontier. In Bolayır, the interval of the image stretches between Axial Age to the present. The walling and “bunkering” of Bolayır isthmus produces a strong case in the investigation of architectural qualities of frontiers. The interval between the erection of the two frontiers highlights the changing of forms, which points out a rearrangement of forces, movements, and positions. The diagrammatic expression of the interval shows that frontier architecture transforms by disintegrating over the land. This disintegration requires a logic with a different functionalization of the space.

Being the latest example of defense architecture in the territory, bunkers can be examined in their functional organization to underline the effectuality between architecture and processes of demarcation. The bunkered landscape is created with the introduction of a new territory. This new territory is established via three main functions described by Bernard Cache. Throughout the text, functions of separation,

selection, and elimination were taken as part of a virtual space, before they actualize in their processes. The function of separation is determined by walls as its architectural element. Walls of a bunker can be deployed in various positions on the terrain. When they are taken as constants of bunkered landscape, forces and fluxes shape around them. Therefore, walls start a virtual movement by crystallizing in different permutations of topographical features. In the third chapter, the conceptualization of those virtual movements was discussed with the term “hollow body”. In his book *Hollow Land*, Eyal Weizman studies the politics of Israeli architecture in comparison to Palestine territory of the settlement.¹⁴⁹ Referring to the name of the book, he states that,

“*Hollow Land* reveals how overt instruments of control, as well as seemingly mundane structures, are pregnant with intense historical, political meaning. Cladding and roofing details, stone quarries, street and highway illumination schemes, the ambiguous architecture of housing, the form of settlements, the construction of fortifications and means of enclosure, the spatial mechanisms of circulation control and flow management, mapping techniques and methods of observations, legal tactics for land annexation, the physical organization of crisis and disaster zones, highly developed weapons technologies and complex theories of military manoeuvres - all are invariably described as indexes for the political rationalities, institutional conflicts and range of expertise that formed them.”¹⁵⁰

After listing his intentions of the text, he addresses the “hollowness” by stating,

“Cut apart and enclosed by its many barriers, gutted by underground tunnels, threaded together by overpasses and bombed from its militarized skies, the hollow land emerges as the physical embodiment of the many and varied attempts to partition it.”¹⁵¹

¹⁴⁹ Op.cit. Eyal Weizman, 6

¹⁵⁰ Ibid.

¹⁵¹ Ibid

His description of the territory highlights the tendencies in contemporary *space of conflict* in which actions and performances are organized, surveyed and mapped. Similar to *No Man's Land* in trench warfare, a type of hollowness plays a role in bunker architecture too. It is not a corridor in-between, rather it is the “body” itself waiting to be deployed or filled. The hollow bunker includes the forces that change the movement, its position to earth, and also all the virtual connections it makes while they actualize. The hollow image of bunkers, therefore, penetrated and stroke roots into every corner of the everyday life, both in destructive and constructive operations.

The bunkered landscape is not concluded without the function of selection. Before connecting each structure to each other, bunkers operate with the terrain. It has a spatial organization which prioritizes orientating in accordance with the topography. The design of the bunkers signifies a channeling mechanism with which it aims to monitor the surroundings. The types of geographical formations it focuses, such as valleys, ridges, and fields, can be defined as places where the flux change its magnitude, rotation and speed. Therefore, it manipulates a part of the geographical movement by standing on passages of energies to monitoring the parts where it cannot deploy itself. Together with monitoring, creation of “trajectory space” completes the function of selection. The emphasis on the trajectory can be better understood with Virilio’s statement,

“[for me] the essential thing is ‘geo-path-ography’. You cannot separate a moving object from a ground reference or a horizontal reference. To the extent that these are trajectories are immaterial, that these are trajectories which are from now subject to absolute speed, we are faced here with one of the enigmas of t.he relationship to one another [...]”¹⁵²

¹⁵² Jean-Marc Offner & Agnes Sander, “For a Geography of Trajectories: An Interview with Paul Virilio”, *FLUX Cahiers scientifiques internationaux Réseaux et Territoires*, (1991): 49

He later describes this enigma as the disappearance of the visual axis and appearance of electromagnetic waves as the perspective of *reality* in military space.¹⁵³ He later highlights that “thinking in trajectories is lost in urban-stillness”.¹⁵⁴ What can be deduced from his acknowledgment of the trajectories as a space defined by the movement of objects? Bunker architecture shapes its form and also is confirmed by it. It is designed to “fire” objects into the air and yet the range of those objects, specifically, includes other bunkers. With this inclusion and network, the foundations of the technologies of electromagnetics and communication were first laid into the depths of social, economic, aesthetics and political territorialization. While interiority of this construction is based on the virtual separations, the exteriority is based on deceptions. Every element of the strata gains a constant disguise in the “tele-environment”. After tele-openings in our homes started firing what is outside, bunkered-lifestyle became inevitable.

The surfaces in bunker architecture react to trajectory space in a way that they change the directions of the objects in impact stage. The function of elimination highlights the “performance” of a bunker during the event of a battle. The beveling of the corners on the exterior façades and denting in interior surfaces are to extend its capacity to perform. Caché embarks upon the smoothing of surfaces in relation to the performance of the user, however, this proposition can be enlarged with the introduction of the reaction between objects. While the territory is divided with bunkered landscape and they are positioned with a direction that they can channel, the disturbing factors are eliminated.

One of the main motivations of the study was to embark upon an extremity. The documentation of the bunkered landscape consists of more than 145 structures. The numbers painted on the walls of the bunkers, on the other hand, reveals that there may be more than a thousand bunkers in the territory. It is clear that the survey does not try to comprehend the wholeness of the bunker-scape. The survey of bunker-scape aims

¹⁵³ Ibid.

¹⁵⁴ Ibid.

to trace the 'real' conditions of the territory. Therefore, the survey extracts the active functions in the control of the territory. If abstract functions define the relations between the landscape and the architecture of Gallipoli bunkers, the frame of their architectural image includes this current condition too. Documenting the current condition provides the data that enables us to draw an interval with a 'maximization' of formal – and functional difference in the genealogy of defense architecture. With this maximization relates the walls and bunkers of Bolayir, the data of the survey articulates this relation.

Power is a significant concept in military discourse. The structure of the power in the bunkered landscape can be a relevant discussion to its function. The construction of a bunker can be expected to have an autonomous design process in which actors decide the locations, directions, and form of the structure. However, they are deeply related to the features of the site, making them bound to the terrain. They are the crystallization of site-specific conditions concerning the defensive measurements. Moreover, they can be categorized according to their function and form, which reveals a typological study, which signals a deterministic work of topography and categorization of conditions. Finally, this organization of the defense structure forms networks between its "particles", in other words, bunkers. These networks can be investigated within their modes of relation which are communicational, trajectorial and logistical concerns. The deployment of trajectories on the bunkered landscape does not only repel the forces but also protect the entrances of other bunkers. As a measurement, it may appear necessary, yet this condition underlines the structural features of the network. This structure does not imply a central position or kinds of centrality. Although there are figures which propels a central image with their size, the trajectorial magnitude with its hardware, etc., each bunker is only notified with another one. The information of an intrusion around the entrance is sent through the visual monitoring system. The network of logistics, on the other hand, provides the energy to give a response to the event. This response is either with maintaining the

mechanism that is notified or with providing an organizational scheme of transportation.

Finally, bunkers are not only *realizations* of *possible* defense structures. In fact, they are the *actualizations* of a *virtual* prelude to 21st century. We cannot escape the bunkering but only resist it. Bunkers will change its forms with different speeds and start crystallizing in diverse geographies. The architect can and should take snapshots with an increasing frequency to sharpen its constantly blurring image. This study, in that sense, tries to achieve a clear shot of its former condition by focusing the object-like qualities of bunkers. With military mentality perceiving the free lands as *his* own possession, I believe we will continue seeing objects similar to bunkers. Therefore, what should be reminded to theory of architecture is to survey the military space, which is deeply embedded in everyday life.

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