LIVENARCH VII

livable environments & architecture

OTHER ARCHITECT/URE(S)

proceedings volume I

7th International Congress

September 28-30 2021 Trabzon TURKEY

KTU 1955

KARADENİZ TECHNICAL UNIVERSITY
FACULTY OF ARCHITECTURE
DEPARTMENT OF ARCHITECTURE
F.ARCH

LIVENARCH VII
livable environments & architecture

LIVENARCH VII

livable **en**vironments & **arch**itecture

7th international congress

OTHER ARCHITECT/URE(S)

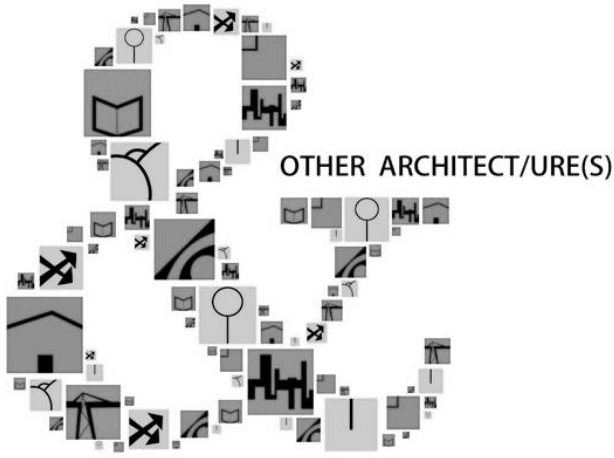
september 28-30 / 2021
trabzon – Turkey

karadeniz technical university
faculty of architecture
department of architecture


OTHER ARCHITECT/URE(S)

LIVENARCH VII

livable environments & architecture



7th International Congress

September 28-30 2021 Trabzon TURKEY

LIVENARCH VII
livable environments & architecture

LIVENARCH VII
livable **en**vironments & **arch**itecture

7th international congress

OTHER ARCHITECT/URE(S)

september 28-30 / 2021, trabzon – Turkey
karadeniz technical university, faculty of architecture, department of architecture

Graphic and Cover Design: Cansu BEŞGEN
Print: KTU Printing Center, Trabzon/Turkey

ISBN: 978-605-2271-42-1 (1.c)
978-605-2271-41-4 (Tk)

* in alphabetical order

LIVENARCH VII
livable environments & architecture

CONGRESS CHAIR

Ahmet Melih ÖKSÜZ

Karadeniz Technical University, Turkey

■

■

ORGANIZING COMMITTEE *

Özlem AYDIN

Karadeniz Technical University, Turkey

■

Aysun AYDIN ÖKSÜZ

Karadeniz Technical University, Turkey

■

Asu BEŞGEN

Karadeniz Technical University, Turkey

■

Nihan CANBAKKAL ATAOĞLU

Karadeniz Technical University, Turkey

■

Serap DURMUŞ ÖZTÜRK

Karadeniz Technical University, Turkey

■

Derya ELMALI ŞEN

Karadeniz Technical University, Turkey

■

Nihan ENGIN

Karadeniz Technical University, Turkey

■

Reyhan MIDILLI SARI

Karadeniz Technical University, Turkey

■

Ayşegül ÖZYAVUZ

Karadeniz Technical University, Turkey

■

Kıymet SANCAR ÖZYAVUZ

Karadeniz Technical University, Turkey

■

Gürkan TOPALOĞLU

Karadeniz Technical University, Turkey

■

Nilhan VURAL

Karadeniz Technical University, Turkey

* in alphabetical order

KEYNOTE SPEAKERS*

■

■

Esra AKCAN

“Human Rights and Architecture”

Cornell University, New York, USA

■

Alper DERINBOĞAZ

““Spatial Ecologies”

Salon Architects, İstanbul, Turkey

■

Linda NUBANI

“CPTED 50 years later. A Compendium of Perceptions and Misperceptions; Standardizations and Ordinances; and Evidence for Impact”

Michigan State University, East Lansing, USA

■

Juhani PALLASMAA

“The Existential Dimensions in Architecture”

Helsinki University of Technology, Helsinki, Finland

■

Vibhuti SACHDEV

““Cultural Identities in Modern Living”

Sushant University, Gurugram, Haryana, India

■

Hüseyin YANAR

“Beyond Perfection: The Architecture of the Other”

Tampere University, Helsinki, Finland

■

* in alphabetical order

SCIENTIFIC COMMITTEE*

Seden ACUN ÖZGÜNLER, *İstanbul Technical University*
Burak ASILISKENDER, Abdullah Gul University
Serdar AYDIN, *Mardin Artuklu University*
Kathryn BEDETTE, *Kennesaw State University*
Gonca BÜYÜKMIHÇI, *Erciyes University*
Ebru ÇUBUKÇU, *Dokuz Eylül University*
Yüksel DEMIR, *İstanbul Technical University*
Pınar DINÇ KALAYCI, *Gazi University*
Neslihan DOSTOĞLU, *İstanbul Kültür University*
Pelin DURSUN ÇEBI, *İstanbul Technical University*
Halil İBRAHIM DÜZENLI, *Samsun University*
Soofia TAHIRA ELIAS-ÖZKAN, *Middle East Technical University*
Adem Erdem ERBAŞ, *Mimar Sinan Fine Art University*
Erhan Berat FINDIKLI, *Istanbul Medeniyet University*
Tayfun GÜRKAŞ, *Özyeğin University*
Yusuf Kenan GÜVENÇ, *Girne Amerakan University*
Ferhat HACIALIBEYOĞLU, *Dokuz Eylül University*
Heidi Svenningsen KAJITA, *University of Copenhagen*
Pınar KISA OVALI, *Trakya University*
Hale KOZLU, *Erciyes University*
Franco MANAI, *The University of Auckland*
Manfredo MANFREDINI, *The University of Auckland*
Feride ÖNAL, *Fenerbahce University*
Hatice Gökçen ÖZKAYA, *Süleyman Demirel University*
Hossein SADRI, *Coventry University*
Aslı SUNGUR, *Yildiz Technical University*
Levent ŞENTÜRK, *Eskisehir Osmangazi University*
Zihni TURKAN, *Near East University*
Osman TUTAL, *Eskişehir Technical University*
Ayşe Nil TÜRKERI, *İstanbul Technical University*
Fatih YAZICIOĞLU, *İstanbul Technical University*

* in alphabetical order

CONTENTS

ACKNOWLEDGEMENTS
Ahmet Melih ÖKSÜZ, Chair

PREFACE
Kıymet SANCAR ÖZYAVUZ, Özlem AYDIN, Gürkan TOPALOĞLU, Ayşegül ÖZYAVUZ, Editors

VOLUME I

POLITICS / POLICIES / LAWS / REGULATIONS / ETHICS
HUMAN / BEHAVIOR
TECHNOLOGY / MATERIAL / SUSTAINABILITY
PHILOSOPHY / THEORY / HISTORY / DISCOURSE
CRITICISM / METHOD

PART I
POLITICS / POLICIES / LAWS / REGULATIONS / ETHICS

POSITIONALITY AND SITUATIONALITY OF THE OTHERS AS A SPATIAL STRATEGY FOR RESISTANCE — 3
Ece YOLTAY

PART II
HUMAN / BEHAVIOR

SPACE PERCEPTION AND AWARENESS IN ARCHITECTURE: THE SIMULATION RESEARCH ON ARCHITECTURAL CHANGES IN ARCHITECTURAL ENVIRONMENT — 19
Alperen ALAN

DISCOVERING “ANOTHER” LANGUAGE: WALKING IN THE CITY — 28
Nilsu ALTUNOK, Pelin DURSUN ÇEBİ

PART III
TECHNOLOGY / MATERIAL / SUSTAINABILITY

DOVETAILED MASSIVE WOOD BOARD ELEMENTS FOR MULTI-STORY BUILDINGS — 47
Hüseyin Emre ILGIN, Markku KARJALAINEN, Olli-Paavo KOPONEN

CONTEMPORARY TRENDS IN SUPERTALL BUILDING FORM: AERODYNAMIC DESIGN CONSIDERATIONS — 61
Hüseyin Emre ILGIN, Mehmet Halis GÜNEL

A STATISTICAL STUDY ON MULTI-STORY TIMBER RESIDENTIAL BUILDINGS (1995-2020) IN FINLAND — 82
Markku KARJALAINEN, Hüseyin Emre ILGIN

A SEARCH FOR A NEW TALL BUILDING TYPOLOGY: STRUCTURAL HYBRIDS — 95
Hüseyin Emre ILGIN

MOBILITY IN MICRO HOUSE COMPETITIONS 108
Refia GÜNGÖR, Nihan ENGİN

TRANSITION FROM NEARLY ZERO ENERGY BUILDING TARGETS TO NET ZERO AND POSITIVE ENERGY BUILDINGS 121
Nurşen SÖNMEZ, Sibel MAÇKA KALFA

THE EVALUATION OF ENVIRONMENTAL SUSTAINABILITY IN THE CONTEXT OF OPERATIONAL AND EMBODIED ENERGY ON EXTERIOR WALL, EXAMPLES OF HOTEL BUILDINGS FROM ISTANBUL 145
Ezgi YILDIRIM, Fatih YAZICIOĞLU

VIRTUAL WAY OF REMEMBERING AND FORGETTING OF PLACE 162
Seda Zafer

A RESEARCH ABOUT SMART FACADE MATERIALS WITHIN THE CONTEXT OF SUSTAINABLE ARCHITECTURE 172
Ayşenur KARAKAYA, Seden ACUN ÖZGÜNLER

THE PLACE OF ADOBE MATERIAL IN MODERN ARCHITECTURE AND DESIGN POSSIBILITIES 186
Ali YILDIZ

AN INVESTIGATION ON PHYSICAL ENVIRONMENT OF EARTH-SHELTERED BUILDINGS 197
Merve BİLGİNER, Şensin AYDIN YAĞMUR, Konstantinos SAKANTAMIS

PART IV
PHILOSOPHY / THEORY / HISTORY / DISCOURSE

IMAGINED SPACES OF THIS WORLD: THE OTHER ARCHITECTURE(S) 217
Türkan Nihan HACIÖMEROĞLU

“DETERMINATION TO SPEECH, SPEECH TO POLICY - THE ISSUE OF ARCHITECTURAL POLICY AT THE JOURNAL OF “ARKITEKT” AND “MIMARLIK” IN 1940-2005” 227
Hasan Tahsin SELÇUK

INTERNAL AND EXTERNAL OTHERNESS OF HILTON HOTEL: EVALUATION OF THE BUILDING IN THE CONTEXT OF DUALITY 246
Aslı CAN VARON

ELEVATED ARCHITECTURE: THE MISSING RELATION WITH THE GROUND 261
Esen Gökçe ÖZDAMAR

A READING FROM KADINLAR DÜNYASI ON THE VISIBILITY OF WOMEN IN THE PUBLIC SPACES OF LATE OTTOMAN ISTANBUL 278
Hatice Gökçen ÖZKAYA, Derya DÜZGÜN

POSTHUMAN SPACE / USER EXPERIENCE IN ANTHROPOCENE AGE 292
Bedriye Begüm NAZLI ERAP, Mustafa Kemal YURTTAŞ, Füsun SEÇER KARİPTAŞ

ALTERATION OF HOUSE IN TURKEY UNDER THE CONSTRUCTION OF MODERN FAMILY AND CHILDHOOD 303
Öykü Su SEZEN

FURTHER MEANINGS ON AMERICANIZATION IN TURKEY: NARRATED ARCHITECTURES, RE-BUILT DOMESTICITIES 317
Seçil ÖZCAN GEYLANİ

AN AUTOPSY OF TRUTH IN DESIGN PROCESS: HOW DESIGNERS THINK IN POST-TRUTH ERA 329
Serkan Can HATIPOĞLU, Ruşen YAMAÇLI

OTHER SPACES IN JEAN BAUDRILLARD 339
Semiha ISMAILOGLU, Asu BESGEN

PART V
CRITICISM / METHOD

INTERMEDIAL PRACTICES IN MAYA LIN'S ART AND ARCHITECTURE 357
Selda BANCI

BRINGING THE CASE OF 'FORENSIC ARCHITECTURE': OTHER DISCIPLIN(ARITI)ES FROM WITHIN ARCHITECTURE 367
Ayşegül ÇAKAN, Gökçeçiçek SAVAŞIR

SQUATTER HOUSING AS AN "ALTERNATIVE OTHER" FOR ARCHITECTURAL THINKING 381
Öncü ÖZALP

RHIZOME AS OTHER IN "MORPHOLOGIE CITY METAPHORS" 393
Kübra SAĞLAM, Serap DURMUŞ ÖZTÜRK

ACKNOWLEDGEMENTS

First of all I would like to say that I am very honored and proud to have held the 7th LivenARCH Congress, which has been organized since 2001 at Karadeniz Technical University, Department of Architecture. The excitement and enthusiasm of organizing such a congress, which has become an institutional and traditional event of the Department of Architecture of Karadeniz Technical University, continues to increase with each new congress. I fully believe that this congress will continue as long as the Karadeniz Technical University Department of Architecture exists.

Karadeniz Technical University Department of Architecture is at the center of the arrangement and organization of the congress. This is a team effort and this team consists of internal and external stakeholders. The fact that the team, organizing the congress works faithfully without losing the amateur spirit, deserves great thanks.

“LivenARCH: Livable Environments and Architecture” which offers a framework where we can talk and discuss as long as humanity and architecture exist, the main theme has been determined as “Other Architect/ure(s)” at the 7th LivenARCH Congress. Here, the importance of discussing the “other(s)” that provides the existence or legitimacy of the center in an environment where architectural theory and practice is built on. Related to this issue, the one is taken as the other whether in the sphere deemed legitimate or in the domain assumed to be illegitimate.

In the theme of “Other Architect/ure(s)”, non-central, undiscussed, undetected architectures and ways of thinking about architecture are pointed out. Within this concept, all theoretical, conceptual, practical and even everyday leaks are included, except for the usual, known, conventional, unique expressions. It is aimed to be able to create uncanny centers and new peripheries to familiar architectural discourses and assumptions, and to ask new questions for architectural thoughts. In other words, with the theme of “Other Architect/ure(s)”, it is sought to realize and reveal other architectural histories, other global/ local architectures, other construction practices, other spatial data about the city and people, in which all central assumptions have been removed.

In this context, “LivenARCH 2021: OTHER ARCHITECT/URE(S)” Congress aims to discuss all the “other(s)” in the main topics of architectural thought,

theory and history, practice, city, man and space from different scales and perspectives such as;

Politics/Policies/Laws/Regulations/Ethics

Economy

Nature/Environment/Public Health

Human/Behavior

Technology/Material/Sustainability

Philosophy/Theory/History/Discourse

Criticism/Method

Identity/Culture/Tradition

Urban/City/Landscape/Rural

Design

Interior Design

Conservation/Transformation/Re-use

Education

Arts/Aesthetics

In accordance with the main theme and subheadings determined at the congress, presentations were made in which of them conveyed their own knowledge and experience with invited speakers from different proficiencies. The invited speaker sessions were designed to be before and at the end of congress sessions. These sessions enriched our congress, opened horizons in terms of the congress theme and created new discussions. In this context, the participation of 9 speakers invited from Turkey and abroad in this congress has been finalized.

They are in alphabetical order:

ALPER DERİNBOĞAZ, Salon Architects, İstanbul, Turkey

ANTONIO URQUIZAR-HERRERA, University of Distance Education, Madrid, Spain

ESRA AKCAN, Cornell University, New York, USA

GÜVEN ARİF SARGIN, Middle East Technical University, Ankara, Turkey

HÜSEYİN YANAR, Tampere University, Helsinki, Finland

JUHANI PALLASMAA, Helsinki University of Technology, Helsinki, Finland

LINDA NUBANI, Michigan State University, East Lansing, USA

REFİK ANADOL, Refik Anadol Studio, Los Angeles, California, USA

VIBHUTI SACHDEV, Sushant University, Gurugram, Haryana, India.

However, Refik Anadol, Antonio Urquizar-Herrera and Güven Arif Sargın, three of these nine invited speakers, could not make their presentations for various reasons. As a result, within the scope of the congress, 6 invited speaker sessions were held.

I would like to express my gratitude and thank the invited speakers who contributed to our LivenARCH-VII Congress by taking time out of their busy work schedules.

The scientific quality of the LivenARCH-VII Congress is naturally made possible by the rigorous review of the abstracts by the scientific committee. In this context, in the first stage, 160 abstracts were sent to our congress, and were evaluated by double-blind review method and 122 abstracts were accepted in accordance with the congress theme and the specified rules. As a result, 83 of these studies, which received positive opinions, completed all the processes and took their place in the congress program. We watched them with great excitement during the congress, in the form of two parallel sessions, in a total of 16 sessions. The papers presented to our congress were: 3 papers under Human/Behavior, 12 papers under Technology/Material/Sustainability, 13 papers under Philosophy/Theory/History/Discourse, 4 papers under Criticism/Method, 10 papers under Identity/Culture/Tradition, 10 papers under Urban/City/Landscape/Rural, 11 papers under Design, 2 papers under Interior Design, 9 papers under Education, 2 papers under Arts/ Aesthetics, and 7 papers under Conservation/Transformation/Reuse subheadings. I would like to express my gratitude to the members of the scientific committee, whose names are given below and who meticulously contributed to the selection process of the papers:

Seden Acun Özgünler (İstanbul Technical University, Turkey) Burak Asiliskender (Abdullah Gul University, Turkey), Serdar Aydın (Mardin Artuklu University, Turkey), Kathryn Bedette, Kennesaw State University, USA), Gonca Büyükmıhçı (Erciyes University, Turkey), Ebru Çubukçu (Dokuz Eylül University, Turkey), Yüksel Demir (İstanbul Technical University, Turkey), Pınar Dinç Kalaycı (Gazi University, Turkey), Neslihan Dostoğlu (İstanbul Kültür University, Turkey), Pelin Dursun Çebi (İstanbul Technical University, Turkey), Halil İbrahim Düzenli (Samsun University, Turkey), Soofia Tahira Elias-Özkan (Middle East Technical University,

Turkey), Adem Erdem Erbaş (Mimar Sinan Fine Art University, Turkey), Erhan Berat Fındıklı (Istanbul Medeniyet University, Turkey), Tayfun Gürkaş (Özyeğin University, Turkey), Yusuf Kenan Güvenç (Girne American University, North Cyprus), Ferhat Hacıalibeyoğlu (Dokuz Eylül University, Turkey), Heidi Svenningsen Kajita (University of Copenhagen, Denmark), Pınar Kısa Ovalı (Trakya University, Turkey), Hale Kozlu (Erciyes University, Turkey), Franco Manai (University of Auckland, New Zealand), Manfredo Manfredini (University of Auckland, New Zealand), Feride Önal (Fenerbahce University, Turkey), Hatice Gökçen Özkaya (Süleyman Demirel University, Turkey), Hossein Sadri (Coventry University, England), Aslı Sungur (Yıldız Technical University, Turkey), Levent Şentürk (Eskisehir Osmangazi University, Turkey), Zihni Turkan (Near East University, North Cyprus), Osman Tutal (Eskişehir Technical University, Turkey), Ayşe Nil Türkeri (İstanbul Technical University, Turkey), Fatih Yazıcıoğlu (İstanbul Technical University, Turkey).

Institutionally, Karadeniz Technical University Rectorate, Faculty of Architecture Dean's Office, Department of Architecture Head Office helped us to benefit from all the facilities of our university. I thank them for this support.

We will never forget those who contributed to the institutionalization, development and success of LivenARCH congresses, those who are not among us, and we always remember them with love, gratitude and respect.

The participants, who showed interest in the LivenARCH-VII Congress, presented their work to this environment and shared them with us and opened them for discussions, are the most important stakeholders of the congress. I also thank them for their participation and contribution.

Together with the LivenARCH-VII Congress and the new LivenARCH congresses to be held in the coming years, we will continue to create an environment for researchers, practitioners, and the ones who think and discuss these issues, to express themselves, to share and to discuss the information they produce. Thank to those who participated and contributed.

Finally, my colleagues in the organizing committee, who took part in all stages of the organization of the LivenARCH-VII Congress and worked with devotion:

Asu Beşgen, Aysun Aydın Öksüz, Ayşegül Özyavuz, Derya Elmalı Şen, Gürkan Topaloğlu, Kıymet Sancar Özyavuz, Nihan Engin, Nilhan Vural, Reyhan Midilli Sarı, Serap Durmuş Öztürk, Özlem Aydın,

and

Çağlar Aydın, Selin Oktan, Barış Çağlar, Aslıhan Öztürk, Güray Yusuf Baş, Melis Yazıcı, Sena Göknur Koç, who supported the online process of the congress,

and

Cansu Beşgen who prepared the graphic designs of the congress,

and

the academic, the administrative staff and the students of the Department of Architecture, to those whose names I cannot mention here, I would like to express my gratitude to you all.

This convention is the first online convention of LivenARCH conventions. If there have been any setbacks in our congress that we have overlooked, I would like to be forgiven for them. I would like to let you know that we will try to eliminate and improve the issues found to be lacking.

I wish your LivenARCH-VII Congress to be remembered as a good event that contributes to your academic life.

LivenARCH-VIII Congress coincides with 2023. The year 2023 is the centennial of the foundation of our Republic. On this occasion, I invite all participants to the LivenARCH-VIII Congress to be held in 2023. We are waiting for everyone to discuss and share new current issues and to benefit from the opportunities offered by Trabzon and the Eastern Black Sea Region at this congress, which I hope will be face-to-face.

I extend my love and respect to you all.

Best Regards,

Prof. Dr. Ahmet Melih ÖKSÜZ

LivenARCH-VII Congress Head

PREFACE

From the Editors

Aftermath of LivenARCH-VII...

The LivenARCH journey began 20 years ago on a roundtable in the Seminar Hall at the Department of Architecture in Karadeniz Technical University. This was the beginning of the first step to reach an international discussion platform about the problems and needs of architecture. Beginning with little notes and key words on a board, the first LivenARCH Congress was held in 2001 with the theme of “Nature-Cities-Architecture” chaired by Prof Dr Şinasi Aydemir. Since then, we held 6 international congresses in 20 years. The 2nd Congress was held with the same theme and chaired by Prof Dr Sonay Çevik. The following congresses; 3rd and 4th were chaired by Prof Dr Şengül Öymen Gür with different themes such as; “Contextualizm in Architecture” in 2007, “Re/De Constructions in Architecture” in 2009, aiming to touch the pulse of architecture. We organized the 5th Livenarch Congress, focusing on "Rejecting/Reversing Architecture", chaired by İlkay Maşat Özdemir, in 2017. There were discussions about reconstructing knowledge of architecture as is or discuss it completely through a reverse perspective. In 2019, 6th Livenarch Congress was organized; the chair being Ahmet Melih Öksüz and the main focus being “Replacing Architecture”. A multidisciplinary approach was prevailing throughout the meetings. Just after the congress, efforts for the upcoming LivenARCH (LivenARCH-VII, 2021) were spared. The theme was chosen to be “Other Architect/ure(s)”.

“LivenARCH- VII 2021: OTHER ARCHITECT/URE(S)” theme points out the ways of thinking about the ideas and the existences of architect/ure(s) that are not central, not discussed and not noticed. The main basis of the theme, except from the usual/known/ordinary/uncanny narratives, includes all theoretical, conceptual, practical, and even crisis productions manifested by everyday leaks. “OTHER ARCHITECT/URE(S)” are all the thoughts and actions formed outside the center, in order to ask new questions for architect/ure(s) in creating uncanny centers and new peripheries. In other words, it is where all central admissions are eliminated; it is a kind of noticeable state in which other global-local architect/ure(s), other architectural histories, other construction practices, other spatial data about the city and people exist.

The concept of “other”, which began to be expressed with modernity, usually existed in the architectural agenda with its divergent and differentiated meanings. Architecture, along with the concept of “other”, defines a form of a relationship that commutes between the center and the periphery, changing in time. In this form of relationship, to discuss the “other(s)” that ensure the existence of the center in an environment becomes important

where architectural theory and practice are built on generating the center/essential/accepted.

In this context, “LivenARCH-VII 2021: OTHER ARCHITECT/URE(S)” Congress aims to discuss all the “other(s)” in the main topics of architectural thought, architectural theory and history, architectural practice, city, man and space from different scales and perspectives such as; Politics / Policies / Laws / Regulations / Ethics, Human / Behavior, Technology / Material / Sustainability, Philosophy / Theory / History / Discourse, Criticism / Method, Identity / Culture / Tradition, Urban / City / Landscape / Rural, Design, Interior Design, Conservation / Transformation / Re-use, Education , Arts / Aesthetics.

Against the presence of a pandemic, forcing the congress to be online, 160 papers were found eligable and were presented.

The book, you are reading now, has 3 volumes, with the papers from different universities, placed accordingly to the sub-fields by our Scientific Committee.

In the 1st Volume, you will see 5 Parts: 1 paper under the heading of "Politics / Policies / Laws / Regulations / Ethics", 2 papers under the heading of "Human / Behavior", 11 papers under the heading of "Technology / Material / Sustainability", 10 papers under the heading of "Philosophy / Theory / History / Discourse" 4 papers under the title of “Criticism/Method” were presented.

In the 2nd Volume, you will see 2 parts: 10 papers under the title/heading of “Identity / Culture / Tradition” and 10 papers under the title of “Urban / City / Landscape / Rural” were presented.

In the 3rd Volume, you will see 5 Parts: 11 papers under the title/heading of "Design", 2 papers under the title of "Interior Design", 6 papers under the title of "Conservation/Transformation/Re-use", 9 papers under the title of Education, 5 papers under the title of "Art / Aesthetics" were presented.

We, as the Livenarch team, wish you days full of groundbreaking studies in the field of architecture...

Özlem Aydın

Ayşegül Özyavuz

Kıymet Sancar Özyavuz

Gürkan Topaloğlu

The Editors & Members of Organizing Committee of LivenARCH -VII
Karadeniz Technical University,
Department of Architecture,
Trabzon
September 28, 2021

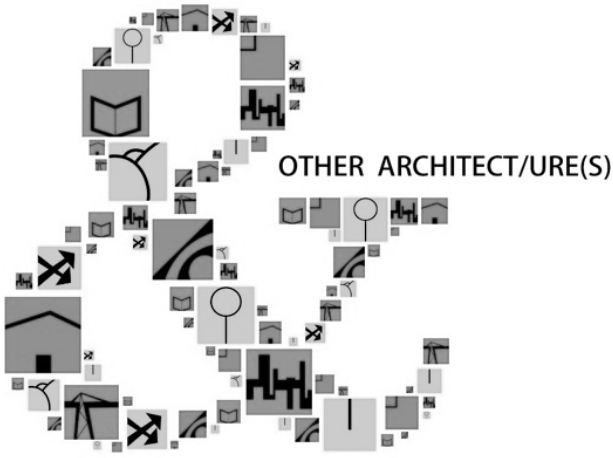
* in alphabetical order


OTHER ARCHITECT/URE(S)

PART I

POLITICS / POLICIES / LAWS
REGULATIONS / ETHICS

LIVENARCH VII
livable environments & architecture



7th International Congress
September 28-30 2021 Trabzon TURKEY

LIVENARCH **VII**
livable environments & architecture

POSITIONALITY AND SITUATIONALITY OF THE OTHERS AS A SPATIAL STRATEGY FOR RESISTANCE

Ece YOLTAY[1]

Middle East Technical University, Turkey
eyoltay@metu.edu.tr

ABSTRACT

This article is based on an empirical research on socio-spatial formation of public assembly of excluded and marginalized subjects because of their social and cultural identities in Turkey. This research is conceptualized with a discussion on social production of public spaces used for socializing, organizing and resisting against spatial politics of ideological apparatus of hegemonic power in Turkey through the notion of 'counter'. This notion is conceptualized in different Marxist theorists as a potential to subvert socio-spatial formation of discrimination and inequality. Results of contextual, conceptual, discursive analyses on relations among power and space, it is claimed that theorization and/or idealization of formation against to hegemonic and repressive authority become concrete as LGBT-friendly spaces in Ankara.

The argument of this article is that bodily and spatial production of these spaces has a potential to subvert exclusionary and marginalizing identity policies by establishing pluralistic and participatory socio-spatial relations.

KEY WORDS: Bio-Politics; Lgbt-Friendly Spaces; The "Supra-Identity"; Subjectification; Turkey.

INTRODUCTION

This study is to analyze how identity politics has been constructed spatially in Turkey and how counter spatial representations and practices have been dialectically produced. Subjectification process of citizen determined according to definition of the "supra-identity" formed by the State Apparatus (Althusser, 1970) is firstly discussed. Identity politics, which determine “ideal” citizen, include a number of exclusionary policies within multi-identity and multicultural social structure in Turkey. Individuals who do not comply with / embrace the "supra-identity" are deprived of social life and the social rights guaranteed by the state to their citizens. In this respect, public space is where accessibility and visibility of othered identities are restricted. Public space where the body has been disciplined discursively and performatively and formed collectively as the subject beyond a biological existence have been produced according to identity politics of government. Subjectification is important for discipline of the body (Butler, 1997), and space are domain of organization of practices of closure, surveillance, prohibition and punishment, that constructs relation between the subject and power. In this relation, power, as beyond of being transcendental because of practices that discipline the body, is internalized by discursive and performative methods that subjects the body to power. Government is described as an activity to conduct individuals by guiding what they do and what happens to them in social life (Foucault 1973,). In this point, governmentality is total of techniques and procedures in order to control and direct human behaviors. The main force that makes individuals a society by collectivizing differences is the functionality of the governmentality and consent culture that the individual subjects to it. The first step towards the transformation of the individual into a governed society is the regulatory interventions in her/his subject formation, which or organized with definition of citizenship through the “supra-identity” based on segregation of ethnic, gender and belief values (Ince, 2012). Therefore, it is not possible for an individual to stay outside of bio-politics as being both object of violence of power (the SA) and subject of construction of power.

On the other hand, as Foucault (1995) says in his panoptic analysis on space, each power dialectically produces its own resistance, there are some public spaces which are produced through occupation and appropriation by the othered identities. This study, secondly, makes a reading of these spaces used by individuals who are marginalized in Turkey due to their ethnic, beliefs, and/or sexual identities to organize and socialize. These spaces named as LGBT-friendly spaces have been isolated from representation and practices of the "supra-identity" in Turkey. In other words, they are venues used for socialization by different ethnic, belief and sexual identities and so locuses of diversity and multiplicity in terms of subject-formation, instead of the standardized identity through definition of the “supra-identity”. These spaces have occurred as a result of a socio-spatial production the othered identities in the course of time through transforming their spatial representations with strategic coexistences. Therefore, discussion on forms of subjectification that produce the other of power relations will be made through the examination of these counter-

spatial productions through mapping of LGBT-friendly spaces in Turkey and interviews of users of these spaces.

The claim of that LGBT-friendly spaces have a potential to produce positionality and situationality of resistance against identity politics that discipline individuals living in Turkey. Owing to “plural", "polyscopic" and/or "polyvalent" relations, LGBT-friendly spaces produce strategically potential zones of cities against Cartesian understanding of the government, such as inclusion / exclusion, center / periphery in identity politics (Phillips, Watt and Shuttleton, 2000). Subversive production of these spaces provides a model in order to prevent a uniform subject-formation (Swyngedouw, 2005). Bio-psycho-socio-cultural formations of inequality in Turkey have caused a need variety of possible combinations of environments as a multiway set of interactions among citizens who jointly produce spaces out of monolithic subject formulations and spatial practices (Innes and Booher, 2007; Farhang, 2012). LGBT-friendly space has a potential for non / out of / beyond bio-politics in opposition to inequality and injustice in Turkey.

The Notion of “Counter”

Construction of “counter” in Turkey

In Turkey where nation-state structure and political Islam have increasingly got stronger in recent years, identity politics in the administration have deepened the segregation within the society by determining uses and users of public spaces. In substance, public space, whose spatial representation and practices are determined by power relations, is not autonomous (Castell, 1983; Lefebvre, 1991). Public space established with political policies produces methods how to life of the society with methods of controlling, regulating as well as surveillance. While individuals who produce their own publicity within the definition of citizenship in Turkey are the users of public space, those who are out of the definition only live in a limited way. Concept of citizenship and its social rights determined after the establishment of the nation-state (1923) by the constitution have defined representational and practical boundaries of public spaces in Turkey. Therefore, being citizenship constructed on a "superior" identity with non-inclusive determinations in multi-cultural social structure of Turkey is an important criterion for how to live publicity (Ayata 1997).

Nationalism is a significant input within the definition of citizenship, and so “ideal” citizen is expected to be loyal to the Turkish identity (Üstel, 2012). In identity politics, excluded and marginalized individuals whose ethnic origins do not conform to "superior" identity have not had equal social rights. Anti-democratic social structure in which nationalism is imposed, these identity groups have been perceived as a “threat” to the unity of the state, and thus they have been subjected to assimilation and violence policies, like village where they lived evacuations by force of arms, homicides of which perpetrators are unknown, mass exiles (Kurubaş, 2018; Yeğen, 1999). Turkism has been systematically instilled into each individual in the country

from the age of education through heroic narratives based on nationalism of the victory of the War of Independence (1919-1922), which ensured the establishment of the state. The society have not tolerated existence of other ethnic origins living the

country because of separatist discourse and practices produced in everyday life. Fascism has become a naturalized reality of the society, and violence against other ethnic identities is legitimized by this reality. People who are beaten for speaking their native language in public space and killed because of freely declaring their ethnic identity are the result of social violence that are not judged and punished by laws.

Citizenship has been described over the definition of exclusion policies, and so every individual livinging in Turkey does not have equal status and rights. Although the republican regime has a secular and modernist orientation, Islam has continued to play an important role in policies on definition of citizenship. In political representation of Islam, other belief groups have been marginalized and deprived of their freedom of belief and worship. Attempt to nationalize religion of Islam in Turkey has been strengthened by administration of Justice and Development Party (AKP), which has been in power since 2002 (Tank, 2007; Aydın and Çakır, 2007). In this context, power of The Presidency of Religious Affairs, which was established in 1924 as one of the first institutions of the state to carry out the activities related to the belief, worship and moral principles of the Islamic religion, was increased by the AKP government. Moreover, politics AKP has established through Islamic propaganda have been produced a polarizing social structure and other religions and sects have been seen as heresy. State resources have been used for the spread and worship of only Islam, and its conservative lifestyle have been imposed on society through politicizing religion.

Another important dimension of the construction of “ideal” citizenship in Turkey is gender since “ideal” citizenship has been defined not only on ethnicity, religion, but also on masculinity (Ustel, 2012, 2016; Amnesty International; 2011). This, coupled with the ongoing impact of Islam in public space led to the exclusion of identities that are irreconcilable to patriarchal and heteronormative norms. As a result, individuals who do not fit into a sexual binarism have generally been forced to hide their identities in order to live their own publicness (Cakırlar and Delice, 2012). In this social structure being increasingly conservative, LGBT individuals are exposed to the violation of the most fundamental right, the right to life, beyond having the standards of society regarding social rights. The existence of these individuals has been regarded as a threat to moral structure of the society by they were blamed for not obeying the customs and traditions of Muslim society.

In hegemonic power relations, various forms of othering in Turkey collectively make up the complicated matrix of exclusion, thereof on individuals who do not conform to the “ideal” citizen: Turkish, Muslim, Sunni and heterosexual (Beşikçi et al., 2013). The regime of discrimination has been consolidated both by legal stipulations (laws that prohibit same-sex marriage, that purport to ‘protect public morality’, or that punish those

'denigrating Turkishness') and social life of nationalist Islam. Social injustice through identity politics affect the control of the use of public spaces since they are the domain that provides the work and control of publicity associated with the definition of "ideal" citizenship. Public space as a space of prohibition, supervision and surveillance of individual behaviours plays an important role in the establishment of the hegemonic structure and its power relations (Foucault, 1995).

On the other hand, public space has a potential to produce counter forces for eliminating oppressive and restrictive politics of the authority. Demands of othered identities for social rights are made politically visible by occupying / appropriating public spaces where they have been isolated, which offers important dynamics for realization. The movements of occupying public spaces ─ for example, Gezi Movement against the transformation project (reconstructing the historical military barracks building as a form and transforming it into a mall as a function) planned for Gezi Park in the city centre of Istanbul by the government (AKP) in order to produce its own ideological spaces in 2013 ─ have made significant gains by reproducing representation and practice of spaces. Additionally, different identity groups have politically associated their struggles against the multi-layered exclusion policies of the government in occupation movements, and public spaces have become both the stage and the tool of resistance.

In Turkey, there are public spaces where social demands of othered identities have been made visible and where these identities socialize, organize and resist in Turkey, which have produced the knowledge and experience of how organization and resistance are established ideologically. In this article, they are discussed as counter spaces. These spaces are produced with a collective will against the interests and operability of discriminative politics in Turkey through occupation movements with political practices. In this respect, performative and discursive formation of LGBT-friendly spaces, in Ankara, will be analyzed since they are manifestation of how counter formation is spatially constructed in Turkey in order to subvert identity politics of the government.

Counter spaces in Ankara

Location of government institution buildings in Ankara have a strategic importance in urban planning in terms of being spatial manifestation of the political establishment and ideological representation of hegemonic power. State administration and military administration buildings are built close to each other (in framed area in figure 1, where many embassy buildings are also located, in figure 2) as the two main forces that establish the nation-state and maintain its existing after victory of the Independence War. The city plan and urban development have been designed according to this settlement, and this area has become a domain of intense urban uses trough construction of buildings with business, commercial and entertainment functions in the time. Moreover, this domain includes counter spaces in Ankara as a dialectical result of hegemonic power established in this urban part. Parks, streets and squares that have importance in the

history of urban resistance as space of mass political actions as well as spaces where the actors of these actions have organized and socialized are mostly located in this area.

This study deals with the analysis of public spaces of othered identities where they socialize, organize and resist against the socio-spatial politics of the authority by utilizing a dialectic relation between social structure and urban space. Public visibility of people who do not participate in the definition of “ideal” citizenship is restricted because the public space constructed according to hegemonic power is not a “neutral” (Cresswell, 2004; Gegl, 2011). The counter spaces in Ankara have occurred as a result of a social production the othered identities in the course of time through transforming their spatial uses determined in the city planning with collective actions and strategic coexistences. In this context, LGBT-friendly spaces, as counter spaces, literally refer to domains where othered sexual identities can socialize without concealing their existences, which are seen as “safe” places for lesbian, gay, bisexual and trans individuals. Additionally, they are also used by othered social groups who are discriminated owing to ethnical and belief identities.

These spaces including cafes, pubs, bookstore, parks, cinema and theater building are domain used both homosexual by heterosexual individuals without homophobic / transphobic practices, unlike other places in Ankara. They have been defined by the LGBT solidarity association of Ankara, Kaos-GL, as places where LGBT individuals can socialize without being exposed to physical or verbal violence. Therefore, underlying reason of differentiation from other cafes and pubs etc. as LGBT-friendly spaces is their socialization practice out of gendered nature of heteronormative social life in Turkey. Therefore, LGBT individuals have not experienced attitudes and behaviors that they may feel under pressure by workers and other users of these spaces. These spaces are stages of construction of a collective will through political and ideological consciousness to the identity politics of the government.

Coming together for same demands in specific times, chatting on socio-politic condition of the country, socializing with remarkable appealing without the irritating glances of other users have made LGBT-friendly spaces practically and representatively alternative domains free from conservative and nationalist socio-spatial uses of public spaces in Turkey. In this regard, separation of profile of users, spatial practices and representation forms with other public spaces allows them to be defined as counter spaces. These space type have constituted important values in Ankara's political history. Therefore, it is important to determine their locations within the city because it contains important references to the urbanization process of the counter. In mapping their locations, their proximity to administration and military administration buildings is firstly noticed, which points to the places where hegemonic relations are established. Secondly, it is realized that these spaces are located in the city center where public transport network (routes of metro, bus, minibus) and urban uses are concentrated, which is important in terms of the social

visibility of the struggle for right to the city as well as formation of democratic demands with a participatory model.

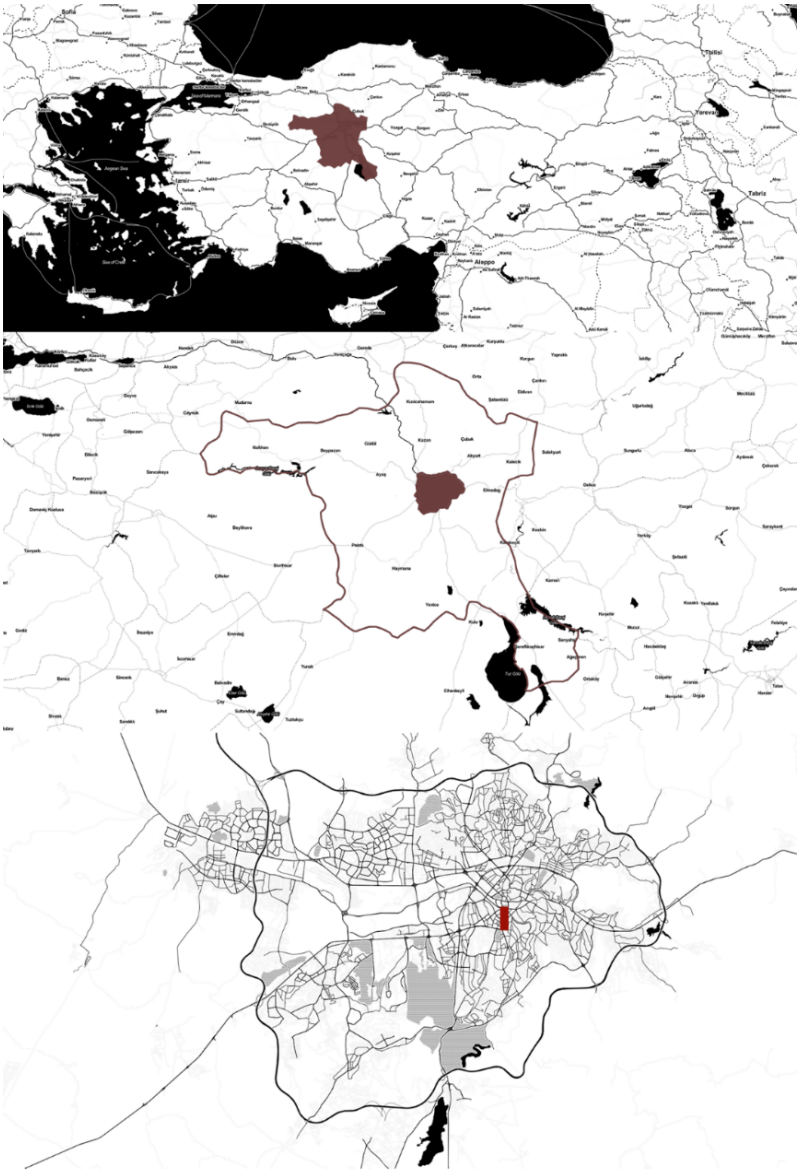


Figure 1. Research area based on the location of the counter spaces (in Turkey; in Ankara, in and, respectively, Çankaya that is the central district of Ankara where most of the political and administrative institutions of the state is situated), 2016.

Figure 2. Strategic importance and location of the research area, in .Ankara.

Research on the "Counter" Socio-spatiality

Interactive relationships between urban space and social structure has been deciphered in this study through the psycho-geographic mapping generated by interviews with the occupants of the spaces. This mapping of the inseparable linkage between human psychology and urban environment is a tool to explore the spatial strategies and tactics beyond sets of urban cartography embedded within particular sets of power relations (Pinder, 1996). The psycho-geographic mapping of these spaces is interrelated with "the material setting of life" and "the behaviour" for systematic and provocative dissemination of *détournement. This notion* is negotiated in Situationism as an unfinished and a sudden change in lived space through "the variety of possible combinations of environments" and "analogous to

the dissolution of pure chemical bodies in an infinitive number of mixtures" (McDonough, 2009; Sadler, 1999).

In the research, this phenomenological approach has been realized by exerting psych-geographic mapping techniques initially proffered for reading urban space by the Situationist International (SI). This is because the focus of this research is to inspect how the opposition is socially constructed through spatial experiences, spatial belonging and memories of othered identities, beyond the examination of the built and concrete features of the city. The psycho-geographic mapping, thereby, is to analyse relational network among perceptual, cognitive and practical production of the counter spaces. It is because, individual experiences and representations of the spaces in their social productions are so complex and overlapping that linear and one dimensional reading it is not possible. The technique of mapping as an urban exploration includes predominantly an "observation of the way people behavior" in an urban environment and, secondarily, "the assessment of the psycho-geographical drift" of users.

To understand how counter-hegemonic formation is produced through bio-politic and social-spatial relations, this qualitative research method is based on interviews with a limited number of occupants of the counter spaces in Ankara. This is important for deepening the research and examining the findings in more detail. In this respect, in order to create maps of personal urban occupancies, six different subjects as occupants who belonged to different genders, ethnicities and religious beliefs were interviewed in 2016. Each map has been created with respect to their spatial recollections originating from that individual perception and cognition of urban practice hinged on socializing, organizing and resisting in the city (figure 3). These six occupants have intensified and strengthened their social and cultural identities within the counter spaces by acquiring political awareness in the process of discrimination and enforcement they have been exposed. That is why, their political positions against hegemonic power in Turkey have an importance regarding with bodily construction of "counter" being.

Therefore, psycho-geographic mapping bases on interviews with people who struggle against authoritarian practices in everyday life in connection with other vulnerable identities. Even if they are exposed to different discrimination politics, actions that solidify demand of "rights to the city" as well as interconnections in spatial practices against unequal social structures come from same identity politics of the state. In this context, discriminated identities have become directly or indirectly political over time and paved the way for the emergence of new identities like leftist, Marxist, socialist, environmentalist, humanist, and animal lover. Indeed, the counter spaces in Ankara are not places only of those of the assembly of 'the Others', but also of the construction of suchlike political identities.

In the interviews made in different times and in different counter spaces, some open-ended questions have been asked with a view to figure out the underlying motives of these spatial occupancies in Ankara. Firstly, they have been requested to introduce themselves by voicing their identities as occupants of the counter spaces ─ the first interviewee introduced "herself" as a "Kurdish", "Alevi", "woman" as well as "Marxist", "vegetarian" (Subject-

1); the second as “Kurdish”, “gay” as well as “sympathizer” of the Kurdish political movement (Subject-2); third one as “Alevi”, “man” as well as “eco-socialist” (Subject-3); fourth as “gay”, “woman” as well as “animal lover” (Subject-4); fifth as “Kurdish”, “woman” as well as “socialist” (Subject-5); sixth as “gay” as well as humanist (Subject-6). The second part is to grasp spatial differentiation of the counter spaces. Therefore, interviewees have independently indicated some public spaces occupied for socializing, organizing and resisting, and routes for circulation/transition between spaces on given city maps as the result of their spatial memories and routines. In this stage, a map of urban part determined according to location of the counter spaces in Ankara was given to interviewees and they were asked to mark where they go for socializing, organizing and resisting and how they go. Marked open spaces (with yellow, figure 3) correspond to resistance spaces collectively produced for “the right to the city” while marked close spaces (with red, figure 3) manifest spheres of socializing and organizing with others. Marked routes shows preferred circulation of the interviewees among these spaces.

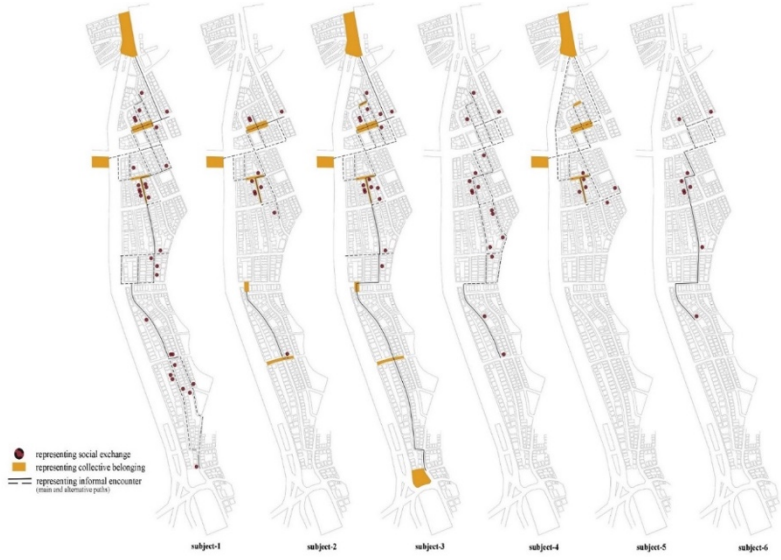


Figure 3. Psycho-geographic mapping of 6 interviewees ─ representing social exchange as red: close spaces including LGBT-friendly spaces and political spaces; representing collective belonging as yellow: open spaces including resistance spaces; representing informal encounter as straight line (main paths) and dashed line (secondary paths): circulation and transportation between spaces, 2016.

These fragmented and allocated urban uses and circulations essentially are further integrated and associated in the psychic sphere of the interviewees through similar “spatial representation” and “representation of space”. The analysis of these maps reveals that the configuration of a spatial differentiation through "material practices" and "element in discourse" of othered identities are organized on a desire to construct a locus of freedom against the prohibitive and discriminative spatial politics of the authority (Harvey & Braun, 1996; Castells, 1977; Tonkiss 2005). Social production of these spaces led to proximity among the spaces, which has stimulated a noteworthy of solidarity for success of their resistance (Yoltay, 2019). It is because, close distances among them have facilitated the spread of counter representation and practices from one space to another, as a spatial flow of counter-formation. In the interviews, two of the occupants have elucidated why they have opted to occupy these spaces indicated in their own maps with the subsequent statements:

> These spaces are where I can communicate with my lover safely and freely. My lesbian and gay friends have informed me about the existence of these LGBT-friendly spaces, but mostly I have learnt where they are through my experiences. In some cafes or pubs in Ankara, for example, I have not been allowed to go inside because of my sexual identity… I have been immediately kicked out as soon as I touched or kissed my partner while all heterosexual couples live their loves freely. Therefore, I have stopped going there. (Subject-2)

> Because of my masculine appearance, people’s eyes are on me everywhere I go. On the bus, in the market, in the park, on the street... This is very disturbing! The fact that people are watching me all the time... But in these places (indicated spaces on the map), I am less exposed to this kind of gaze of straight people. The only reason why I go there is this. I feel more comfortable there. (Subject-4)

This spatial differentiation has originated from a socio-spatial break (*détournement*) depending on subversive bodily ‘conspicuity’ of othered identities in a gendered space of a patriarchal social structure (Bell & Valentina, 1995; Butler, 1997; Cossman; 2007; Brown & Knopp, 2008). In addition to the public visibility or accessibility of othered identities, acts of resistance towards social discrimination and inequality have led to a shift in spatial practices and representations of the public spaces as deliberated by local and central governments. The dynamism of such radical changes affects and feeds surrounding socio-spatial existences in the city.

> I have used some marked spaces (the LGBT-friendly spaces) on the map for chatting on political issues and for meeting new people. Other marked ones have some effects upon my life. Political experiences in these parks, streets and squares (the resistance spaces) have changed my point of view. These places have showed me the presence of those who think like me and this has increased my strength to resist against inequality. (Subject-3)

This interrelatedness among LGBT-friendly spaces has constructed a socio-spatial network that provides a unity of othered identities (collectivity and togetherness in the same streets, parks, pubs, cafes). In this network, these spaces have been converted to a habitat dominated strategically by discriminated individuals as a need of spaces where they can legitimize their existence and their struggles for justice. These spaces produce a solidarity network for their marginalized identities as the place where social relations and resistance are established together. The constant use of these spaces for socialization, organization and resistance, while providing spatial belonging, also gives othered identities an advantage in the representation and daily practices of these spaces, where they cannot be considered a minority in the society. These spaces, which enable different identities to associate and cooperate on similar issues, are therefore a social exchange, encounter and collective being space where the individual can express their ideas and reactions easily and establish new relationships.

CONCLUSION

In a social structure that is conservative over identity politics and standardized over national values, public space is political because it is open to the use of individuals who fit the definition of citizenship. Public spaces are exclusionary and marginalizing under a discriminatory administration established with the nation-state structure and governing with the political Islam movement. In this respect, LGBT-friendly spaces, which are occupied and appropriated by practices of socialization, organization and resistance, have the power to provide variety and plurality in society. Because as spaces where minority identities express their social demands and ensure their social visibility, they bear traces of how a democratic social life will be ensured with their socio-spatial representations and practices.

REFERENCES:

Amnesty International (2011) ‘Ne bir Hastalık ne de Bir Suç’ Türkiye’de Lezbiyen, Gey, Bisekseül ve Trans Bireyler Eşitlik İstiyor. Avaible at: https://amnesty.org.tr/public/uploads/files/Rapor/TURKEY%20'NOT%20AN%20ILLNESS%20NOR%20A%20CRIME'%20LESBIAN%2C%20GAY%2C%20BISEXUAL%20AND%20TRANSGENDER%20PEOPLE%20IN%20TURKEY%20DEMAND%20EQUALITY.pdf (as of January 24, 2020)

Ayata A (1997) The Emergence of Indenty Politics in Turkey, New Perspectives on Turkey, vol. 17, pp. 59-73, Cambridge University Press, DOI: 10.1017/S0896634600002752

Aydın S and Çakır R (2007) Political Islam in Turkey, Insight Turkey, vol. 9, no.1, pp. 38-55, JSTOR, https://www.jstor.org/stable/26330770

Bardakçı M (2018) Yıkılış ve Kurtuluş: Osmanlı İmporatorluğu’nun Çöküşü ve Türkiye Cumhuriyeti’nin Kuruluş Belgeseli [Fall and Salvation:

The Documentary Organization of the collapse of the Ottoman Empire and the Republic of Turkey]. İstanbul: Turkiye Iş Bankasi Kultur Yayınlari.

Bell D and Gill V (1995) Mapping Desire: Geographies of Sexualities. New York: Routledge.

Beşikçi İ, Kutlay N, Ustel F, Ozarslan O, Polatel M, Bekaroğlu M, Çelik M (2013) *Resmi İdeoloji ve Kemalizm* [Official ideology and Kemalism]. Istanbul: Ceylan Yayıncılık.

Brown M and Knopp L (2008) Queering the Map: The Productive Tensions of Colliding Epistemologies. Annals of the American Association of Geographies, 38(1):456-463, April 2011, DOI: 10.1002/9780470979587.ch59

Butler J (1997) The Psychic Life of Power: Theories in Subjection. California: Stanford University Press.

Cakırlar C and Serkan D (2012) *Cinsellik Muammasi: Turkiye'de Queer Kultur ve Muhalefet* [Sexualiy: Queer Culture and Opposition in Turkey]. Istanbul: Metis Yayinlari.

Castells M (1977) The Urban Question. London: Arnold Press.

Cossman B (2007) Sexual Citizens: The Legal and Cultural Regulation of Sex and Belonging. California: Stanford University Press.

Foucault M (1973) The Order of Things: An Archeology of the Human Sciences,

New York: Vintage Books.

Foucault M (1995) Discipline & Punish: The Birth of the Prison. New York: Vintage Books.

Harvey D and Bruce B (1996) Justice, Nature and The Geography of Difference. Oxford: Blockwell Press.

Innes J E and Booher D E (2007) Reframing public participation: strategies for the 21st century Reframing public participation: strategies for the 21st century, Planning Theory & Practice, vol. 5, pp. 419-436. DOI: 10.1080/1464935042000293170

Kurubaş E (2018) Kürt Sorunu: Doğuşu, Gelişimi Niteliği [The Kurdish Question: Its Emergence and Development]. Avaible at: https://www.beyaztarih.com/turkiye-tarihi/kurt-sorunu-dogusu-gelisimi-niteligi (as of January 24, 2020)

Lefebvre H (1991) The Production of Space. Oxford: Blackwell.

McDonough T (2009) The Situationists and The City. New York:Verso.

Pinder D (1996) Subverting Cartography: The Situationists and Maps of the City, Environment and Planning A: Economy and Space, SAGE, First Published March 1, 1996 Research Article. DOI: 10.1068/a280405

Phillips R, Watt D and Shuttleton D (2000) De-centring Sexualities: Politics and Representations Beyond the Metropolis. New York: Routledge.

Sadler S (1999) The Situationist City. MIT press.

Swyngedouw E (2005) Governance Innovation and the Citizen: The Janus Face of Governance-beyond-the-State, Urban Studies, SAGE, First Published October 1, 2005 Research Article. DOI:

10.1080/00420980500279869

Tank P (2007) Political Islam in Turkey: A state of controlled secularity, Turkish Studies, vol 6, pp. 3-19, Taylor & Francis, DOI: 10.1080/14683840420003392 94.

Tonkiss F (2005). Space, The City and Social Theory: Social Relations and Urban

Forms. Cambridge: Polity Press.

Ustel F (2012) Vatandaşlık [Citizenship]. In: Atılgan G and Aytekin EA (eds) Siyaset Bilimi: Kavramlar, İdeolojiler, Disiplinler Arası İlişkiler [Political Science: Concepts, Ideologies, Interdisciplinary Relations]. İstanbul: Yordam Kitap, pp. 123-137.

Ustel F (2016) Makbul Vatandaş'ın Peşinde, II. Meşrutiyet'ten Bugüne Vatandaşlık Eğitimi [Pursuit of the Ideal Citizen, Citizenship Education from the Second Constitutional Monarchy to the Present]. İstanbul: İletişim Yayınları.

Yeğen, M (1999) The Kurdish Question in Turkish State Discourse. Journal of Contemporary History'. 34(4) (1999): 555-568.

Yoltay E (2019) Socio-spatial Politics of the Otherness: Desire to Construct a Counterhegomony. Space and Culture. Epub ahead of print 15 March 2019. DOI: 10.1177/1206331218822955

PART II

HUMAN / BEHAVIOR

LIVENARCH VII
livable environments & architecture

OTHER ARCHITECT/URE(S)

7th International Congress
September 28-30 2021 Trabzon TURKEY

LIVENARCH **VII**
livable environments & architecture

SPACE PERCEPTION AND AWARENESS IN ARCHITECTURE: THE SIMULATION RESEARCH ON ARCHITECTURAL CHANGES IN ARCHITECTURAL ENVIRONMENT

Alperen ALAN[1]

[1]Beykent Universty, Turkey
alperenalan@beykent.edu.tr

ABSTRACT

One of the definitions of space, is the determined frame which is generally shaped by architectural elements. Therefore, space perception and awareness become important parameters in architectural design. The way of how to interact with the space of an architect or an architectural student is significant. To investigate the architectural significance of the perception of space by analyzing the ways of interaction, to make a preview of the extent to how much architects and architecture students understand the space is the main objective of this study. In this article, firstly the interaction with the space is discussed and the architectural awareness is emphasized. A case study was conducted on architecture students from Middle East Technical University. The Faculty of Architecture Canteen is selected as the location. The relationship between awareness and memory analyzed in the case study to measure workplace awareness and response to change. The simulation was applied with Virtual Reality glasses on 20 volunteers who were selected among Middle East Technical University architecture students in January 2019. The students observed the change that was closest to them first and foremost. And it was observed that the students of architecture were open to architectural changes in architectural space.

Key Words: Space Perception; Awareness; Architectural Space; Architectural Change; Virtual Reality.

INTRODUCTION

Space as a term has many various and different definitions. As one of these definitions, spaces are the place where we have been in it or where we are restricted by a determined frame. The interaction between people and space can be in different ways. They can interact with each other such as psychological and physical interactions. The main objective of this study is to investigate the architectural significance of the perception of space by analyzing these ways of interaction, to make a preview of the extent to how much architects and architecture students understand the space. Architectural awareness is an important perception method for architects and architecture students. It is an essential issue that how much an architect or architecture student is aware of the spatial changes around themselves. The extent to which an architectural design influences user, especially in this study architects and architecture students by creating an awareness effect, is one of the factors determining the quality of that design. There are several types of research related to perception exists. From a psychological point of view, personality has a significant role in perception within the interaction of our environment [1]. It is also important for the survival of people to know about characters in the environment as an object of perception [2]. To serve this purpose, to understand our environment, to experience the world most predominant method is the visual system [3]. Perception is a period and behavior of perceiving, which contains percept, the conscient experience of the distal object or scene [4]. All these researches on perception term attract to this research study. Therefore, in this study the subject and scene are accordingly selected: architecture students and their constantly used environment.

This paper firstly will examine the importance of space perception and under that title, ‘space’ will be observed such as the relations with space as an interaction, to identify space and interiorizing space. In the second chapter, space perception topic will underline awareness, especially in architecture. And finally, the case study on architecture students and its objectives, methods, and results will be focused by the paper.

IMPORTANCE OF SPACE PERCEPTION

The importance of the relationship between the concepts of space and perception can be discussed in terms of interaction with space, identifying space and interiorizing space.

Interaction with Space

The interaction with space comprises meaningful communication elements beyond the person as a subject and space as an object. For instance, an architect when designing space, they think about the perception of that space however, they could be receiving various emotional feedback which they don’t expect. One of the meaningful communication elements here is the emotional effect that occurs on the person. From this point of view,

emotions can be seen as a helpful element for the understanding space and object as a dimension of knowledge [5]. People experiment their environment with their sensations and all knowledge comes to them via perception [6]. This shows sensations come into prominence while perceiving the space. Pallasmaa illustrates that, "…the echo of steps on a paved street has an emotional charge because the sound reverberating from surrounding walls puts us in direct interaction with space; the sound measures space and makes its scale comprehensible…" [7]. As a consequence of interaction, people perceive the space. Furthermore, understanding how people act in an architectural space does not explain why they act as they do, and this point of view is related to the people's emotional response to architectural space [8]. And this response could be a useful parameter for architects and architecture students when they are designing the space. Feeling the space, living in the space and experience the space are also another meaningful communication elements.

Identifying the Space

After mentioning the interaction of space, the space identity is another main subject for the importance of space perception. Perception is the first step of interaction when users face with space, but after perception receiver starts identifying that space in their terms. For example, when a user, entered a place like a mosque, after perception of the atmosphere, the user initiates the identity of self-environment. Starting to explain volume, dome, columns, and windows etc… Hence, it becomes self-identification of space according to the knowledge of users. Furthermore, when somebody who hasn't been that mosque before, asked about the mosque to that user, the user will answer that question with his/her identification of space. This shows the identifying the space has an important role for architectural perception and space design.

Interiorizing Space

Identification is one step further after the interaction, first people interact with space, then identify it and finally interiorizing it. Space becomes a person's internal memory after their identification of space. The image can be seen as the currency of exchange between perception and memory and also can be seen as a mode of transportation between the past (or the remembering) and the present (or the perceiving) [9]. This explains the relation between perception and memory like a connection between past and present. Therefore, the personal connection occurs after the with space as a memory. This connection creates spacious memory and urban memory. For instance, after the demolition of AKM (Atatürk Kültür Merkezi) in Taksim, İstanbul demolished for the renovation in 2018. But the people who are using Taksim square every day as a route recognized that emptiness after demolition and their minds are searching for the building in that area. Then it illustrates, how space (square with its surroundings) becomes a memory object and demolition of AKM (perceived object) affects people perception

via its non-existence. Consequently, spaces' collective memory is a result of that interiorizing process of space.

ARCHITECTURAL AWARENESS

The concept of awareness, in this article, in places where the detection result becomes a memory; will be considered as behavior against changes in space. Architects and architecture students have the responsibility to realize their environment and spaces due to their disciplines. A good designer is aware of the place around them. Under this heading, the awareness of the architectural environment and the responses to architectural changes in this environment will be discussed.

Awareness of Architectural Environment

Is it the task of architects and architecture students to be aware of the architectural environment? If architects and architecture students do not do this awareness, who should do this? But the responsibilities of architects and architecture students towards the environment are inevitable. As a designer, to perceive the environment, to make a memory, to come to urban memory as the culture is one of these responsibilities. As a matter of fact, the physical and psychological effects of the architectural environment on society are inevitable. Any construction projects on public parks can be given as an example. The spatial protection instinct that starts with a park could turn into a community response. In fact, society has as much urban memory as architects and architecture students. Moreover, behaviors of people in buildings and urban environments, including public spaces like hospitals, airports or offices, it is a challenge for architectural designers [10]. Because when architects are designing these places, they must consider the spatial impact and awareness afterward occur. This is also a responsibility for architects, recognizing the environment and knowing how to design the environment.

Reaction to Change in Space

The reactions to space changes as well as spatial awareness are also important. People often don't like the change things they've become accustomed to. Is this the same for the built environment? Are the changes in the environment particularly architectural changes affecting the society as much as, architects and architectural students? Or, to a city you haven't been in for 5 years, how do you see the architectural changes you have encountered in the city square after 5 years? When space becomes the memory after the perception, the awareness establishes a direct relationship with this memory. Alteration; tests the state of awareness. People's reaction to change may not always be negative. With urban regeneration, many people prefer to live in smaller apartments, although the architectural perception of the neighborhood will change. This is rather than

a desire to have a "new" understanding; can also be seen as requesting a change.

CASE STUDY: METU FACULTY OF ARCHITECTURE CANTEEN

Research Objectives

The main subject of this study is the extent to which changes in space are realized and perceived. To what extent architects and architecture students perceive especially architectural changes in the spaces around them and to what extent they are aware of this is the main purpose of the study. We mentioned that users first interacted with space, then defined the space and finally internalized it. In this study, the relationship between awareness and memory will be analyzed. It aims to measure workplace awareness and response to change.

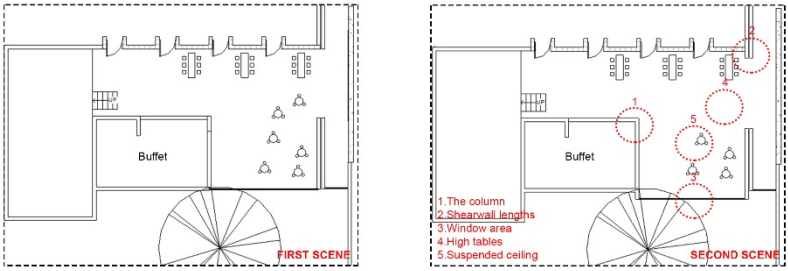


Figure 1. The architectural changes in METU Faculty of Architecture Canteen in Plan

Case Study: Method

Today, a wide range of new technological facilities are used in space studies. Augmented Reality and Virtual Reality (VR) are some of them. VR technology sustains an easily editable simulation environment for architecture. VR technology has been preferred in this study and users can see the space more realistically. METU Architecture Faculty canteen was selected as the location. This is due to the fact that a canteen is a place with functionally intensive users and the relationship that users establish almost every day with that space is strong. The canteen was modeled in two different ways in Revit Autodesk software, as it is and with a number of architectural changes. After that, the 3D panoramic render image was screened on Iphone 6S Plus model smartphone in VR Box glasses. These two virtual environments have been shown to the users and they have tried to measure how much they realize these architectural changes. Users were asked to answer various questions, and finally, they were asked which place they preferred.

Subjects

20 volunteers were selected from METU architecture students. In this selection, there is no distinction between genders and between undergraduate or graduate students. The reason why students are chosen from architecture is that they have experience in perceiving the architectural space and they have experience of awareness. The reason why users are from METU architecture is that the responses to the change in a memorized space will be more understandable.

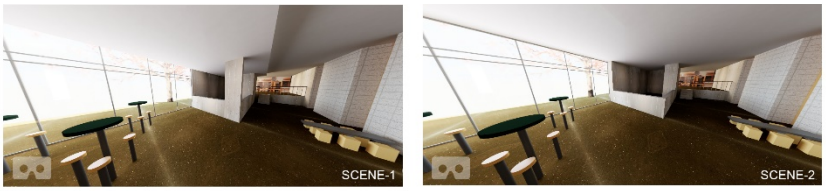


Figure 2. 3D panoramic renders of the two different scenes in VR simulation.

Stimuli

In the space (canteen), primarily architectural elements were determined, and it was decided which ones would change. The load-bearing column at the corner of the buffet section was removed, the length of the load-bearing shear wall was changed, the window area was shifted towards the outer space, two high tables and seats were removed in the middle of the space and lastly, suspended ceiling in the buffet part was removed (Figure-1). The users are shown in the first environment (current canteen status) and the second environment (where these changes are made) in Virtual reality.

Questionnaire

After being shown to users in two locations in a Virtual Reality environment; three questions were asked. The first of these questions was “Which architectural changes did you recognize?” and the architectural changes were listed in the answers and the user was asked to mark the changes that were noticed. In the second question, “Please give a number of 1-5, according to your recognition order”, requested; the changes were ordered sequentially, and they were asked to enumerate them according to their order of recognition. In the third question, they were asked which place they preferred.

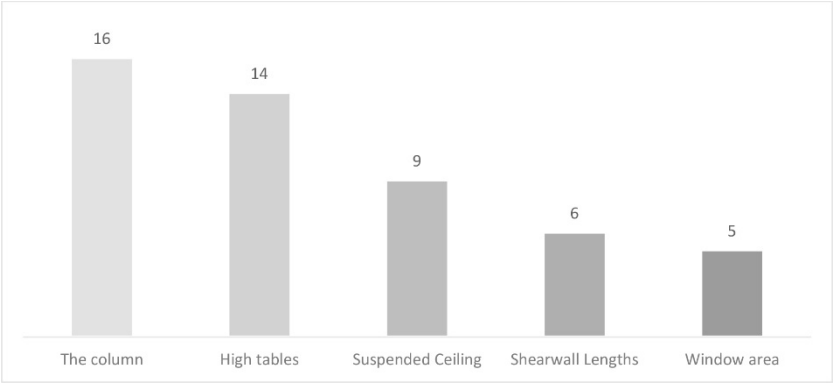
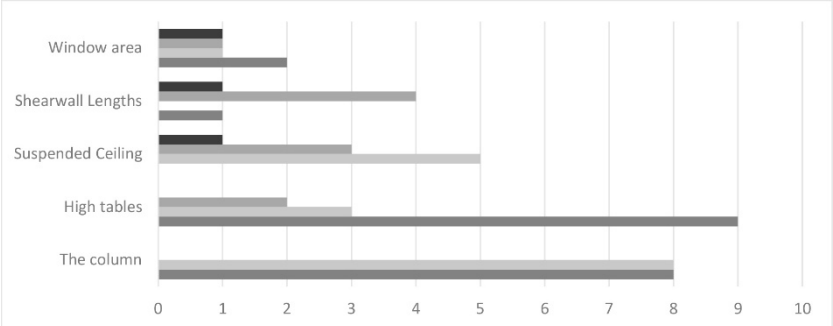


Figure 3. The answer results of “Which architectural changes did you recognize?” out of 20 Students.

Results

As a result of the studies, various results have emerged. 16 out of 20 users realized that there was no column in the buffet part, 14 users realized the absence of high tables in the middle of space, 9 users realized absence of the suspended ceiling in the buffet part, 6 users realized change on the shear wall lengths and 5 users realized change on the location of window area. The second result is; the first change that 9 people mostly first noticed, was the “absence of the high tables in the middle of space”. Second mostly noticed change was “absence of the column on the corner of the buffet”. Third mostly noticed change was “change on the shear wall lengths”. And fourth there was no mostly noticed a change, but remaining changes, change on the location of window area, change on the shear wall lengths and absence of the suspended ceiling in the buffet area, were noticed finally by the same number of users. The third result is; users indicate their most preferred space was the second one, with the 12 out of 20, the remaining 8 preferred the first space.



	The column	High tables	Suspended Ceiling	Shearwall Lengths	Window area
4th	0	0	1	1	1
3rd	0	2	3	4	1
2nd	8	3	5	0	1
1st	8	9	0	1	2

Figure 4. The recognition order of users according to second question answer

CONCLUSION

In this article, the importance of space perception, interaction with space, the definition of the space and the internalization of the space are discussed. Then, the focus was on architectural awareness and the response to change in space and space in the architectural environment was examined. Finally, the perception of space of architecture students was tried to be measured with VR simulation research, through METU architecture students in the METU Faculty of Architecture canteen. According to the result of the study, users' perception on architectural changes depends on two critical factors: the distance and the interaction. The changes that the users most noticed in the space were the changes that were closest to the user. The least notable change, change in the location of the window area, shows that the last noticeable change in the farthest. And the architectural element which user interact more than others, is the most noticed to change. The high tables are the interior design elements which students use most. Second mostly recognized element, the column also stands in buffet corner where the interaction of the students is high. The second main result of study; students most preference space was the second one indicates that the students choose the more open architectural spaces with less constructional elements (the column, suspended ceiling). In addition, the fact that users prefer the second space more often can be seen as an indication that architecture students are open to changes in the space. Although this study is not comprehensive enough to generalize, it can be seen as a preliminary study on space perception and awareness in architecture.

REFERENCES

[1] Ibrahim, A. F., Abu-Obeid, N., & Al-Simadi, F. (2002). The effect of personality traits on architectural aesthetics' evaluation: Familiar and non-familiar environments as evaluated by architectural and non-architectural students. Architectural Science Review, 45(3), 197-210. doi:10.1080/00038628.2002.9697511

[2] Goldstein, E. B. (2009). Sensation and perception. Belmont: Wadsworth. p. 2.

[3] Hekkert, P. (2006). Design aesthetics: Principles of pleasure in design. Psychology Science, 48(2), 157–172.

[4] Hershenson, M. (1999). Visual space perception: a primer. The MIT Press.

[5] Barrett, L. F., & Bar, M. (2009). See it with feeling: affective predictions during object perception. Philosophical transactions of the Royal Society of London. Series B, Biological sciences, 364(1521), 1325–1334. https://doi.org/10.1098/rstb.2008.0312

[6] Nia, H.A., Atun, R.A. and Rahbarianyazd, R. (2017), "Perception Based Method for Measuring the Aesthetic Quality of the Urban Environment", Open House International, 42(2), pp. 11-19. https://doi.org/10.1108/OHI-02-2017-B0003

[7] Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester: Wiley-Academy. p.55.

[8] Shemesh, A., Talmon, R., Karp, O., Amir, I., Bar, M., & Grobman, Y. J. (2017). Affective response to architecture – investigating human reaction to spaces with different geometry. Architectural Science Review, 60(2), 116-125. doi:10.1080/00038628.2016.1266597

[9] Bergson, H. as cited in Vora, P. (2003) Simulacrum : Situated Memory for Architectural Space. Thesis (S.M.), MIT.

[10] Bhatt, M., Hölscher, C., & Shipley, T. (2011). Spatial Cognition for Architectural Design. New York.

LIVENARCH VII
livable environments & architecture

DISCOVERING "ANOTHER" LANGUAGE: WALKING IN THE CITY

Nilsu ALTUNOK[1], Pelin DURSUN ÇEBİ[2]

[1]Istanbul Technical University, Turkey
altunokn20@itu.edu.tr
[2]Istanbul Technical University, Turkey
dursunpe@itu.edu.tr

ABSTRACT

This paper proceeds from the idea that the critical spatial practices which establish environments for new kind of relationships to emerge between body and the surroundings of the body are alternative ways of understanding and establishing a dialogue with the city. In this context, the paper focuses on critical everyday practices which have performative and explorative aspects. This paper differentiates itself from the common literature by approaching to "the walking act" critically and pursuing temporary, perceptual and experiential potentials of understanding and narrating the city through the "other". The aim of this paper is to investigate and discuss "other" spatial data about city, people and movements in order to increase spatial awareness to city by the help of critical practices. By that way, revealing "other" languages which are provided by acts and movements of the body in the city becomes feasible.

The aim was fulfilled by portraying "the walking act" as a critical everyday life activity, discussing it on a theoretical basis, looking at different walking styles or walkers and then conducting a case study. According to these discussions, "critical walking" description of this paper was defined. Then, the case study was carried out by walking and synchronously extracting the things which can be related with "other" by mapping. The mapping created is not a finished representation with sharp boundaries, unlike the architectural design representations we are accustomed to. The paper traced the "other"s in the city and opened them up for discussion to discover "another" language to make sense of the city.

Key Words: Another Language of the Body; Walking and Mapping in the City; Critical Everyday Practice; Bodily Experience in the City.

INTRODUCTION

Along with the epistemological paradigm shift originated at the beginning of the twentieth century, the concept of space has started to be described upon body in motion. Since the phenomenological approach suggested that perception is related to the subject rather than to the object, the concept of space has been portrayed to be the space of dynamic and perceptive body which is in movement. This shift caused the concept of space to deny human-centered, cartesian and rational concepts. These human-centered, cartesian and rational concepts of body and space were reducing the interactions of body and space into fractional measurements and visuality. The orthographic set and perspective view which investigate the city top-down with a human-centered perception of the universe which began with the Renaissance models of vision and observer, was failing to capture experientiality and eliminating observer -as a subject- and his/her experience.

At this point, it would be significant to convey that, body is not a stable concept when it is interacting with space. Rather, body is a dynamic concept which both transforms space and becomes transformed in space. Merleau-Ponty clarified this dialect between body and space by implying that the bodily experience of movement is not an information of a specific thing, rather, it is a pulpit for dispersing through world and matter (Direk et al, 2017). The epistemological paradigm shift has made concepts of body and space gradually move ahead a slippery surface and paved the way for more heuristic, empirical, critical and ambiguous discourses. The focus of this paper is critical everyday practices which emerge in these empirical and ambiguous discourses and the main assumption of the paper is the potential of critical everyday practices to reveal “other” languages which are provided by acts and movements of the body in the city.

In this paper, an everyday practice “walking in the city” is discussed as a critical performance. One of the strongest questionings behind this intention grounds on De Certeau’s discourse about “walking in the city”. De Certeau (1988) embraced “the act of walking” as a spatializing and space constituting act with its aspect of persistency on the surface in each step and he admitted the routes which are articulated to that deem as reflections on the city’s geography. De Certeau’s thought provoking discourse which denied top-down, human centered perception of the universe supports this paper’s way of searching. De Certeau (1988, p.92) asked, rhetorically in his book *The Practice of Everyday Life* that:

“Must one finally fall back into the dark space where crowds move back and forth, crowds that, though visible from on high, are themselves unable to see down below? An Icarian fall.”

Based on these, this paper aims to investigate and discuss “other” spatial data about city, people and movements in order to increase spatial awareness to city by the help of critical practices and reveal “other” languages which are provided by acts and movements of the body in the city. Here, “other” languages phrase is used as a metaphor which grounds on semiotics. According to Yücel (2005) language is not only made up of

talking or text, at the same time communication is not only made up of machines. Indeed, many activities in the world can be interpreted as some kind of language, some kind of message transmission, some kind of meaningful activity (Yücel, 2005). Therefore, it is restrictive to say that there is just one way to comprehend the language and its relationship with architecture. Rather, there should be "other" languages for revealing transmitted messages in the city and talking about "other" spatial data about city, people and movements while investigating the city critically. From this point of view, the structure of the paper continues within the framework of a notable question: If the bodily experience of one's movement becomes a pulpit for dispersing through world and matter and at the same time, constitutes the dialect between subject and space; how can body establish "another" language with movement and acts that it articulates into this movement while performing this movement? The question will be answered by portraying "the walking act" as a critical everyday life activity, discussing it on a theoretical basis, looking at different walking styles or walkers and then conducting a case study. This paper differentiates itself from the common literature by considering the act of walking as critical way of looking at our surroundings and representing the walk with mapping that pursues perceptual and experiential architectural representation potentials to displace the reduced top-down observation understanding of architectural representation.

The Walking Act as a Critical Everyday Life Activity

Jane Rendell's "critical spatial practice" term answers to the question which asks the meaning of critical everyday life activity. She put importance on not only critical but also spatial by "indicating the interest in exploring the specifically spatial aspects of interdisciplinary processes or practices that operate between art and architecture" (Rendell, 2006, p.20). To her, walking as an everyday life activity is also a critical spatial practice because there are possibilities of new kind of relationships to emerge between subjects and objects in architectural design while investigating spaces that are in transformation and encountering with social cases (Rendell, 2006). Therefore, the criticality in spatial practices establishes the connection between space and understanding of space by providing an environment for new kind of experiential, heuristic and ambiguous subject-object relationships in architectural design.

Throughout this paper, there are two main acts which constitute criticality. One of them is "walking in the city" and the other one is representation of the walk, namely, mapping of the walk. The relationship between them is rooted in American philosopher and gender theorist Judith Butler's concept of performativity. Butler (1988) propounded that, the body performing a public performative act is not just a passive receiver written in cultural codes, it plays its own role and animates interpretations within the limits of existing directives. Hence, walking-based mapping practice offers a performance of place in which the walker interprets the walked place and the map goes beyond being a reduced representation. Furthermore, the critical potential of "walking in the city" is bound up with its characteristic of generating an

alteration between space and subjective performance. When the subject - for this study, researcher- performs the walk, both specific location and time-duration-speed variables alter the walker's perception and by that way, his/her subjective experience. While De Certeau was establishing his concept, he also criticized the representation of urban cartographies which are far from representing the performative and explorative aspects of the walking act. Doina Petrescu (2015) highlighted De Certeau's walking concept as difficult to define and represent because of its aspect of being an ontological experience. With its regards of paving the way for rejecting systematic ideas of the city which are forced by urban planners and managers, walking offers a mode of "being in the world" for Petrescu (2015). Another critical aspect of "walking in the city" is about speed problem in perception and exploration. Modern city with its high-speed means of transport and access, shifts human perception and this causes dissociations between space and subjective performance. Careri (2002, p.68) clarified this situation as:

"The Futurist city was crossed by flows of energy and eddies of the human masses, a city that had lost any possibility of static vision, set in motion by the speeding vehicles, the lights and noises, the multiplication of perspective vantage points and the continuous metamorphosis of space."

Towards the end of the 20th century, the walking act, which has potential to criticize the city from different perspectives, gradually moved away from the literal meanings of daily life and derived metaphorical meanings. Beyond its literal meanings like romantic country walking, hiking, walking for health, being a pedestrian, recreational walking, walking for thinking, marching in groups, window shopping, urban pedestrianism; the act of walking was even described by Baudelaire (1995) as a tool for making a political statement.

Dismantling of Various Walks in terms of Criticality

In this paper, to portray the act of walking as a critical spatial practice, various walks and walking styles that are considered and discussed in terms of criticism are dismantled. To begin with, various philosophers walked while they were musing. Despite his physical pain, Nietzsche needed to walk to think. For him, thinking was something to do on the road. He did not trust the thought that the movement did not participate in and he put significance on thinking while walking and walking while thinking (Gros, 2017). Likewise, Rimbaud and Rousseau were also walking to think and concentrating thoughts during this intense working moment. Whereas Rimbaud described himself as "just a pedestrian", Rousseau said that only while walking can he truly think, gather his mind, create and find inspiration (Gros, 2017). Moreover, Thoreau walked for writing, he thought that there is no need to go far away to walk and he walked around where he lived (Gros, 2017). While Nerval questioned why we were walking, Kant walked because he waited for his thoughts to get on surface (Gros, 2017). The common point of all these walks is that the alteration between space and subjective performance is totally introverted. In these walks the walked place and walker redefine each other but these definitions do not seek to criticize the

space of the performance. So that, in some of these walks the place which was walked became unimportant or reduced into visuality. Although "walking for thinking" offers a mode of "being in the world", it can be described as weak in criticality because of its focus on introversion of one's own mind.

Figure 1. "Walking for Thinking" Notions

When we seek after critical virtues of walking act, these can be dated back to Baudelaire's (1995) concept of *"flâneur".* The meaning of the word comes from the verb *flânerie*, that means *to stroll*, *to loaf around*. *"Flâneur"* observes his/her surrounding with *"disinterested curiosity"*, as he/she *walks through the crowds* but *without being part of the crowd*. Flâneries and *curiosity* make the walking act an ideal vehicle for *personality formation* and *learning through the body*. It is an extraordinary *anthropological activity* because it arouses a constant concern for understanding, *finding one's place in the structure of the world*, *questioning one's bond with others* (Le Breton, 2003). Frédéric Gros (2017) pointed out that "the *'flâneur'* emerged depending on three elements and three conditions: *city, crowd, capitalism*". *"Flâneur"s* criticism is to the cities that had turned into a forest with their passages, their sudden changes in perspective, their dangers and surprises. Capitalism was criticized by the *"flâneur"* in terms of being "reign of the commodity" and "commercialization of the world" (Gros, 2017). Nonetheless, *"flâneur"* is discussed contentiously as a gendered, racially and geographically marked figure of 19th century by Springgay and Truman (2018). Since *"flâneur"* is a male figure who enjoys a tremendous amount of spare time in a marked geography, he remains anonymous and detached from the city and thus is supposedly able to observe the world around him (Springgay and Truman, 2018). However, *"flâneur"s* criticality is weakened by *not suggesting an intervention* or a representation for his/her observation.

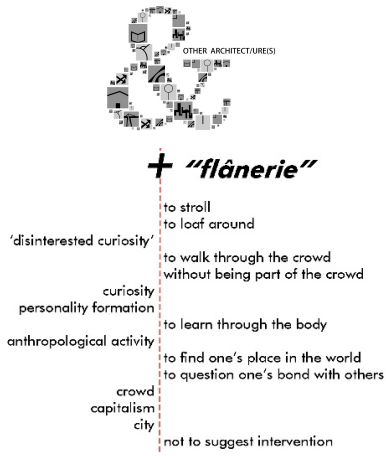


Figure 2. "Flânerie" Notions

After Baudelaire introduced the concept of *"flâneur"* in the 19th century, this concept continued to be discussed in the 20th century. For instance, Walter Benjamin (2003) referred to the concept of "flaneur" by accepting it as an analytical tool and a lifestyle in the 20th century. Besides, in the 20th century, changes in everyday life arose from the epistemological paradigm shift which was mentioned before. Because of the dynamic concept of everyday life, walking act turned into a critical practice of the urban. At that point, it is significant to mention and discuss about two "Dadaist excursions" which were held in 1921 and 1924. Dadaists were considered as the first community to accept the walking act as a *collective activity*. In 1921, they set their first excursion as *an attempt to move artists* and arts from museums and galleries *to the street* and people. The meeting which was held on 14 April 1921 was *announced to public* with flyers and press releases and artists' presence was *recorded with photography*.

Figure 3. Dada "Excursions" Notions

After this first excursion, a second excursion set in 1924. For this second excursion, there was *not a pre-determined aim for walking*. The walked places were chosen *randomly* from map and therefore, the second excursion was noted to be a prospective transition from Dadaist urban operations to Surrealism (Özcivanoğlu, 2019). For the second excursion the main point which shows transition to Surrealist approaches is considering *creative potential of unconscious mind*. Careri (2002) referred to Andre Breton's Surrealist manifesto that, the excursion in 1924 was about investigating the *"unconscious parts of the city"*. In his manifesto, Breton articulated the concept "Surrealist Deambulation" as a walking act in which there is absence of a pre-determined path and is an *"exploration between waking life and dream life"* (cited in Özcivanoğlu, 2019, p.22). In a word, there is a clear difference between these two walks in terms of criticism. In "Dadaist excursion" which was held in 1921, there is a pre-determined aim for walking: moving artist from museums to street, the walking was recorded

and accepted as a collective activity. However, for the "Surrealist Deambulation" there is no pre-determined aim, recording or a collective activity. Thus, "Dadaist excursion" seems to have more potential to produce criticism towards the space of the walking.

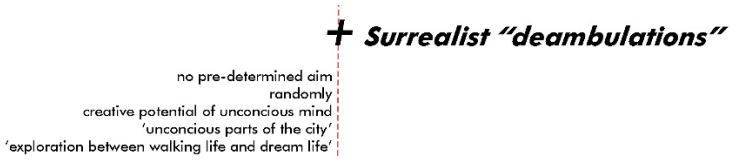


Figure 4. Surrealist "Deambulations" Notions

Next, the act of "derive" may be discussed after "flânerie", "Dadaist excursions" and "Surrealist deambulations". *"Dérive"* means *to drift*. The concept of "derive" with its aspect of being a *collective act* and an *"alternative way of inhabiting the city"* was introduced by Lettrists (McDonough, 1994). *"Dérive"* can defined as *experimental body of behaviors* and movements that bound up with the urban condition: a technique of passing through varied ambiances in usual (Andreotti and Costa, 1996). When it comes to critique of this act, Lettrists *criticized Surrealists' concept of unconsciousness*, because they gave importance to the *"transformative potential* and *revolutionary energies*" of the city (Özcivanoğlu, 2019). Another aspect of these walks was *cross-checking the impressions* of walkers and this strengthens the collectivity and participation. Furthermore, these walks were recorded in Lettrist texts and eventually became the "manuals of using city" (Careri, 2004). Indeed, the concept of *"dérive"* started to shape a new understanding of *cartography*. As the first examples of maps of walking, these maps were composed of fragments, collage and disorientations. The new understanding of cartography has paved the way for other discoveries.

Figure 5. Lettrist "Dérive" Notions

The discoveries which derived from the concept of *"dérive"* can be articulated as Situationist "psychogeographical discoveries". After *"dérive"* shaped a new understanding of cartography, Guy Debord demonstrated *situationist cartography* as *mapping the perception* while walking through the city. "Psychogeographical discoveries" were suggesting performative representation tools for the experimental walking act and by that way contributed to be critical while walking. Debord (1981) indicated these mapping practices as investigations of the *"psychological climates"*. The features which were mapped, were trying to express the *emotions* and

behaviors of walkers. Therefore, main elements of these mappings were arrows which indicate *directionality* and *itineraries*.

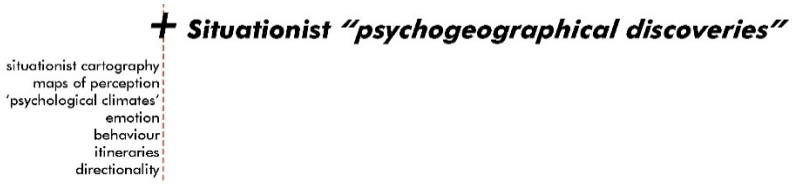


Figure 6. Situationist "Psychogeographical Discoveries" Notions

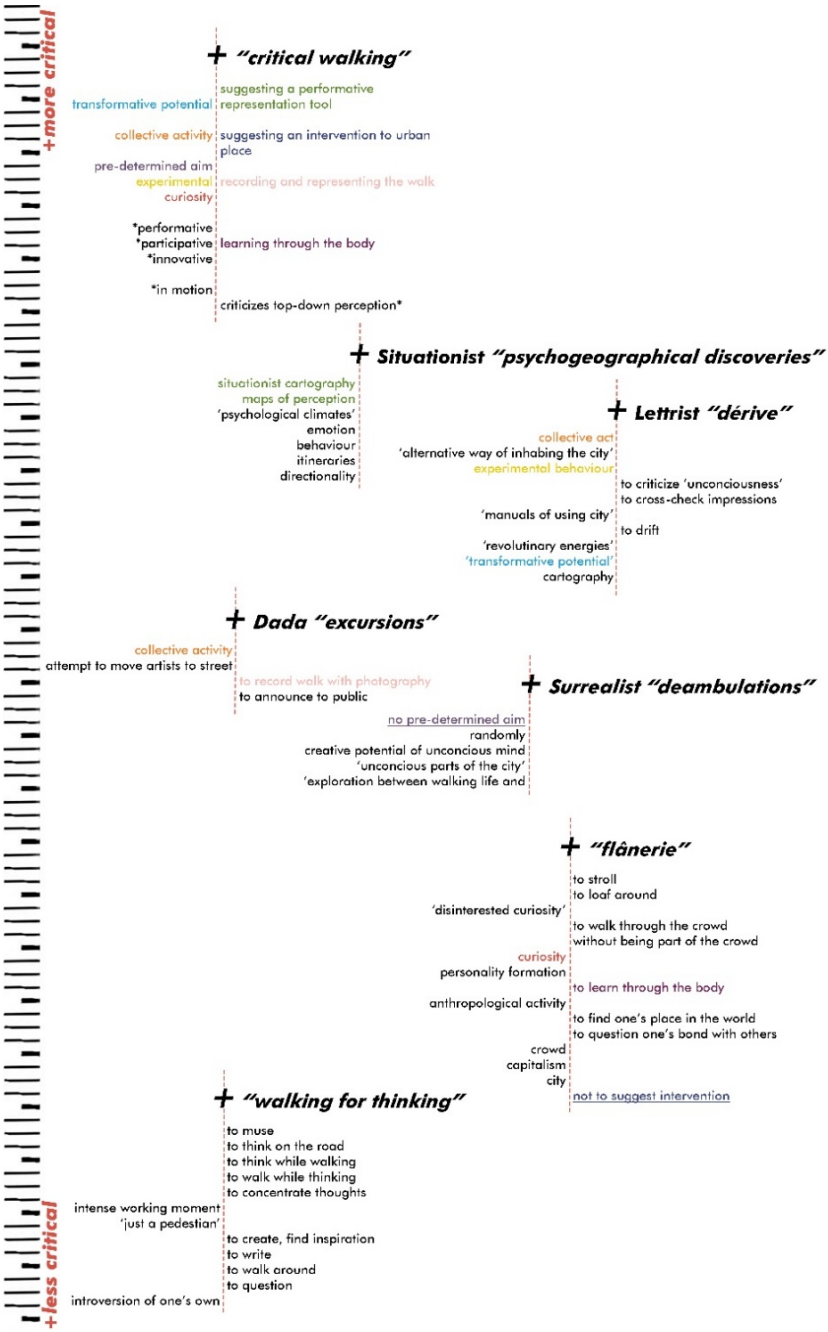
Walkings' Table of Criticism

Within this study, all these forms of walking styles, walking theory, walking methodologies, walking events and walking art –namely walking knowledge itself– have been reviewed and dismantled into their most significant aspects and notions (Figure 1,2,3,4,5,6). According to this dismantling and theories on critical spatial practices; spatial practices that arise from walking practices performed in a critical manner to create awareness, put experimentality-curiosity and learning through the body on forward, suggest a performative representation tool, have a transformative potential, suggest an intervention to urban space are decided and referred as "critical walking" description of this paper (Figure 7). In addition to these, "critical walking" methodology involves performativity, participation, innovation, motion and a self-critique to top-down perception of the universe (Tümerdem, 2018).

Figure 7. "Critical Walking" Notions and Aspects

In this study, it is propounded that "critical walking" methodology -which possesses these stated aspects- paves the way for an individual to criticize his/her surrounding, increase his/her awareness to the city and easily represent "other" spatial data according to his/her experience in the city. Thus, to make sense and explore the specifically spatial aspects of interdisciplinary processes or practices that operate between art and architecture becomes possible. The individual becomes open to new kind of relationships that emerge between subjects and objects in architectural

design and makes discussion about future transformations and interventions for that specific space. To understand where the “critical walking” is situated among all previously stated walking styles, “walkings’ table of criticism” was created. The ranking of these aspects is made according to how visible the criticality is. Since criticism appears as concrete as possible only in the act, such features like transformative potential, suggesting an intervention and performative representation tool are crucial for “critical walking”. So, in the following figure all previous walks that were mentioned in literature review are evaluated and ordered according to criticality (Figure 8). This table is a tool that includes the definition of the “critical walking”, its position among other walks, the characteristics it should have and it has become the general lexicon of the walker. For these reasons, it has paved the way for determining the frame of this paper’s “critical walking and mapping” strategy.



Politics/ Policies/ Laws/ Regulations/ Ethics

Human/ Behavior

Technology/ Material/ Sustainability

Philosophy/ Theory/ History/ Discourse

Criticism/ Method

Identity/ Culture/ Tradition

Urban/ City/ Landscape/ Rural

Design

Interior Design

Conservation/ Transformation/ Re-use

Education

Arts/ Aesthetics

Figure 8. Walkings' Table of Criticism "Critical Walking" Notions and Aspects

Where to Walk?

After outlining general lexicon of “critical walking” in the “walkings’ table of criticism”, the study is continued by locating the “critical walking” case study. As the intention of the paper is to investigate and discuss “other” spatial data about city, people and movements and reveal “other” languages which are provided by acts and movements of the body in the city, it is outstanding to chase “otherness” in the city by the case study. Owing to this chase, it is asserted that mapping the unexpected events, situations, actions or things which are strongly relevant with “other” and bringing out a new type of representation possibility that establishes “another" language to read and make sense of the city. Aslıhan Şenel (2013) stated that, mapping performance can be an alternative to top-down urban representations and suggests making sense and criticizing the complex relationships in the city. The alternative which was mentioned by Şenel correlates with “another” language metaphor in terms of chasing new possibilities of representation in architectural design. Moreover, the concept of “critical walking” tried to be conceptualized in this study is an in-situ and site-specific practice which attaches importance to subjective experience of the walker and his/her criticism towards the walked place. Due to these reasons, locating the case study becomes crucial for this paper’s way of searching.

In order to locate the case study, a place that is physically inside the city but contrariwise remained outside the city due to its spatial transformation was sought after. Since De Certeau (1988) embraced the act of walking as a spatializing and space constituting act with its aspect of persistency on the surface in each step, to walk and represent the walk in "another" place devoid of such an everyday practice show potential. The act of walking mentioned here is a means of reading the relationship of the body with space, not through the spatial practices we are accustomed to but through spatial practices that activate the body and increase spatial awareness. Therefore, by activating body-space relationship and at the same time subject-object relationship, suggesting “another” way of representation in architectural design and discovering “another” language to maintain communication between body and space may be enabled.

At this juncture, the study interprets being physically inside but contrarily remaining outside the city to a kind of introversion and disconnection from context. De Certeau’s (1988) “travelling incarceration” conceptualization overlaps with the type of place this paper seeks. De Certeau (1988, p.111) discusses train as a metaphor that acts like a module that encapsulates and closes everything inside including move and perception:

“Inside, there is immobility of an order. Here rest and dreams reign supreme. There is nothing to do, one is in the state of reason…Outside, there is another immobility, that of things, towering mountains, stretches of green field and forest, arrested villages, colonnades of buildings, black urban silhouettes against the pink evening sky, the twinkling of nocturnal lights on a sea that precedes or succeeds our histories.”

He asks rhetorically, “What is happening? Nothing is moving inside or outside the train.” (De Certeau, 1988, p.111). So, for an individual inside

that module there is nothing in movement. Both the inside and outside is immobile in terms of perception. Such a place has been conceptualized as a "rational utopia" and to perform this study's "critical walking", a "rational utopia" was tried to be found. In this sense, Marmaray line in Istanbul which looks physically inside the city but remained outside the city because of its encapsulation into itself and that is away from everyday walking practices, showed potential in terms of revealing "another" language by "critical walking" case study.

Walking and Mapping

From this point forth, the "critical walking" case study was conducted on Marmaray line between Suadiye and Feneryolu stations. General lexicon of "critical walking" which was mentioned before, was the central pillar of the case study and the case study was carried out by walking without a map or a guideline, synchronously extracting the things which can be related with "other" for this specific "rational utopia" -Marmaray line- with mapping (Figure 9). To explain the structure of the walking and mapping strategy, three main layers can be mentioned.

First layer is the *surface of the mapping* and is in a strong relationship with the context of the walked place. For this case study, the surface of the mapping was marked as a partial trace perceived while walking and set between extracts. Second layer is composed of the *extracts from the walked place*, namely marked issues that are connected with "other"s. Here, "other" corresponds to unconventional, disruptive, unfamiliar, out of context, unexpected, strange, contrasting. To settle the extracts from the walked place, the walker holds a glossary which stems from both "critical walking" lexicon and the "rational utopia" metaphor. The notions that make up the glossary is as follows: scale, border, transition, wall, edge, going under, going over, dead end, old and new. Since Marmaray was placed on the trace of the old suburban line, along the line, old buildings on the edge of the line, high walls exposed due to the rise and fall of the ground level of the city undergoing a major transformation, or borders surrounded by barbed wire can be seen. Moreover, this scaleless vehicle, which divides the neighborhood into two, dominates the pedestrian and vehicle crossings of the neighborhood scale to which it does not belong. This dominance is manifested in the facts that; it forces people to line up on a border where the area narrows, creates viaducts by descending, makes sterile underground passages by rising and cannot meet people coming from both sides of the neighborhood at its stations. That is, the notions like scale, border, wall, edge etc. in the glossary that reveal "other" spatial data to be recorded while walking were chosen because of the characteristics of this specific "rational utopia". The third and final layer of the walking and mapping strategy is the *combination of mapping*. This layer is the state of bringing together the surface of the mapping and the extracts from the walked place, with the occurrence of many actions such as cutting, tearing, overlapping, subtracting, highlighting, expanding, explaining, erasing, outlining, scanning, annotating, scribbling, narrowing, drawing lines… The mapping of the walk on the Marmaray line, which was handled with the

metaphor of “rational utopia”, emerged with the overlapping of these three layers, and brought them up to discussion by pointing out the “other”s of Marmaray line between Suadiye and Feneryolu stations, in a way “other” than the usual representational forms.

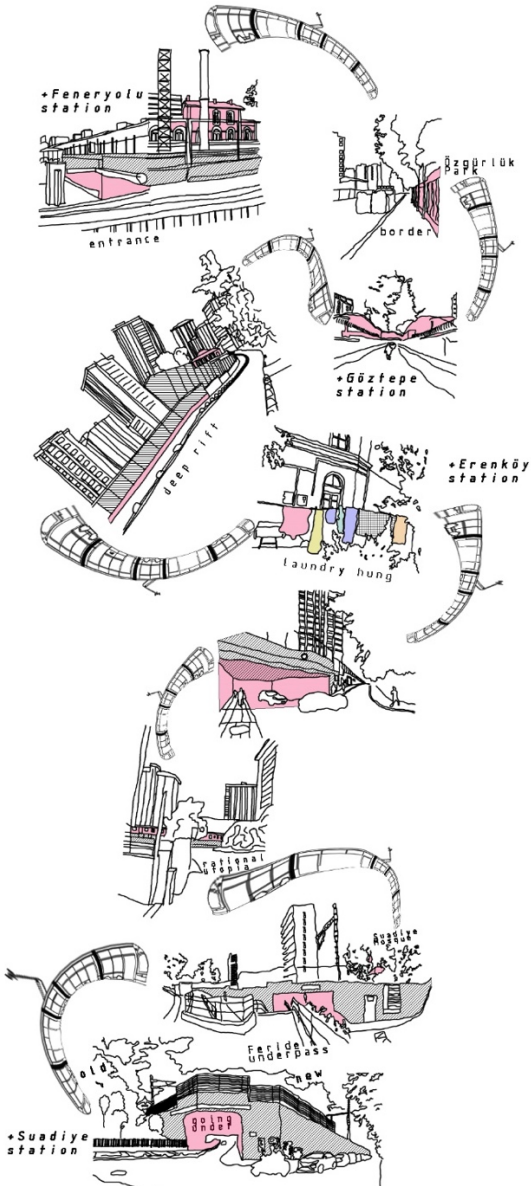


Figure 9. “Other”s of Marmaray Line Mapping

Discussion on the Mapping

The mapping created is not a finished representation with sharp boundaries, unlike the architectural design representations we are accustomed to. Since different recordings from another eye or even the same eye at different times can be made, the discussion can be approached from different points. Although mapping tries to produce criticism by making determinations on certain events, situations and movements encountered during the walk, the coming together of these specific events, situations and movements also prepares the ground for “other” discussions.

To start the discussion on the “other” spatial data revealed by the mapping; the Suadiye station, where the walk began, represented the situation, movements and events highlighted by the “rational utopia” metaphor including extracts about notions like; scale, old, new and going under. To clarify, this part of the mapping marked the giant wall that carries the Marmaray line much higher than the current level, expressing the Marmaray line as if it were put here from above. The fact that the historical Suadiye station building remained unrelated to context on the edge of this giant wall was marked by lines that try to show itself in the mapping. Then, Feride underpass, which can pass pedestrians to the other side of the Marmaray line with a four-armed ramp near Suadiye Mosque, was transferred to the mapping in the footsteps of the notions: transition, border and going under. In addition, the fact that the top-down urban planning left the Suadiye Mosque on the shore of the Marmaray line forces the worshipers to line up along the one-meter area between the Marmaray and the mosque. The bridges, which carry the “rational utopia” that closes everything inside, create huge walls that crush the scale of the neighborhood they are in, and encounter the residents of the neighborhood with these walls at every point where the line passes. While these giant walls are bare in some places, they are decorated with graffiti that can be considered as the product of “another” action in other places. When the walk continued and the Erenköy station is reached, the laundry hung in the garden of the historical Erenköy station is represented in the mapping as one of the “other”s encountered during the walk. This situation directly shows that; with the utilization of new station structures, historical station structures remained unplanned, lost their function or were used in inappropriate functions. Moreover, in the regions where the road level rises, the lower Marmaray rails continue to create buried high walls and create deep rifts in the city. The historical Göztepe station, like other historical stations, remained unconnected and dysfunctional at a point where the Marmaray line coincides with the road due to the systematic ideas of the city which were forced by urban planners and managers. The new Göztepe station, sits on the corner of the street as if it is a type project placed from the top and prevents people coming from two different directions from meeting. This situation was represented in the mapping by cutting the image of Göztepe station and mirroring it across the street to convey the mismatch of type project station with the context. One of the “other”s marked in the mapping is the state of Özgürlük Park, which is surrounded by borders, detached from both the Marmaray line and the road next to the line, which was encountered while coming towards the Feneryolu station. A criticism was produced in the mapping against the fact

that this recreation area, which is likely to contribute to the top-down placement of the Marmaray line in the city, is surrounded by walls. Finally, the pedestrian entrance, which had to be given from the side of the vehicle road taken under the Marmaray line at Feneryolu station, was mapped and criticized that the line was placed in the city without considering the details of the pedestrian-vehicle relationship.

To draw attention to an issue, the discussion opened by the critical walking and mapping on the Marmaray line is not limited, just like the representation is. The methodology, which pursues “another” language that produces criticism about the city, seeks to pave the way for new and ambiguous discussions instead of making specific discourses. Therefore, it is possible to expand the discussion on the mapping created and approach it from different ways.

CONCLUSION

Since the time that orthographic set and perspective view which investigate the city top-down which began with the Renaissance models of vision and observer started to dominate architectural representation, everyday practices that put importance on experientiality, observer’s experience and their connection with criticality should be reopen to discussion. As Judith Butler (1988) propounded that, the body performing a public performative act is not just a passive receiver written in cultural codes, it plays its own role and animates interpretations within the limits of existing directives. Based on this idea, this paper focused on “walking in the city” and subsequently mapping the walk in a critical manner to investigate and discuss “other” spatial data about city, people and movements in order to increase spatial awareness to city by the help of critical practices and reveal “other” languages which are provided by acts and movements of the body in the city. The metaphor of "other" languages was used in place of the possibility of unconventional forms of representation and grounded on semiotics to imply that any message transmission can be discussed as a language. According to the focus of the study, to portray the act of walking as a critical spatial practice, various walks and walking styles that were considered and discussed in terms of criticism were dismantled. In the sequel, “critical walking methodology” of this paper was put forward and a case study was conducted on Marmaray line in Istanbul to reveal “other” spatial data and “another” way of representing them critically. Based on the case study, a mapping was created and reopened to discussion to make the “critical walking” visible.

As a result, “critical walking methodology” and its representation were brought forward as critical spatial practices which can be added to with the perspective of each new observer and enriched by the experiences of the same observer at different times. As an outcome of the case study, interpreting and criticizing the “other”s of Marmaray line with “critical walking” have enabled discussion that Marmaray line has become a “rational utopia” that has been cut off from the neighborhood scale, harming pedestrian relations, breaking the bond between the old and the new, and

sometimes breaking the visual and physical relations. Once and for all, looking at the “other”s with the “act of walking” gives the body an open and unconventional awareness of the city to make us become inhabitants who can look more critically to our surroundings and reveal “other” languages provided by acts and movements of the body in the city.

REFERENCES

Andreotti, L., & Costa, X. (1996). Situationists: art, politics, urbanism. Barcelona: Actar.

Baudelaire, C. (1995). The Painter of Modern Life and Other Essays. London: Phaidon Print.

Benjamin, W. (2003). The arcades project. Cambridge, MA: The Belknap Pr.

Butler, J. (1988). Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory. Theatre Journal, 40(4), 519-531. doi:10.2307/3207893

Careri, F. (2002). Walkscapes: Walking as an aesthetic practice. Barcelona: Editorial Gustavo Gili.

Certeau, M., & Rendall, S. (1988). The practice of everyday life. Berkeley: Univ. of California Press.

Debord, Guy. (Ed.). (1981). Introduction to a Critique of Urban Geography. Berkeley, California: Bureau of Public Streets.

Direk, Z., Gökyaran, E., Granade Şahin, G., Aygün, Ö., Savaşçın, Z. & Zengin, N. (2017). Dünyanın Teni: Merleau-Ponty Felsefesi Üzerine İncelemeler. Istanbul: Metis.

Gros, F., & Ulutaşlı, A. (2017). Yürümenin Felsefesi. Istanbul: Kolektif Kitap.

Le Breton. & D., Yerguz, I. (2003). Yürümeye Övgü. Istanbul: Sel Yayıncılık.

McDonough, T. (1994). Situationist Space. October, 67, 59-77. Retrieved from http://www.jstor.org/stable/778967

Özcivanoğlu, S. (2019). Map-Making as a Walking-Based Spatial Practice in Architecture (Master's thesis, Middle East Technical University, Ankara). Retrived from YÖK Ulusal Tez Merkezi. (595016)

Petrescu, D. (2015). Architecture of Walking. In P., Blundell Jones, M., Meagher (Ed.). Architecture and Movement: The Dynamic Experience of Buildings and Landscapes (pp.112-120). New York: Routledge.

Rendell, J. (2006). Art and Architecture: A Place Between. New York: I. B. Tauris.

Sarah, E. T., & Stephanie, S. (2018). Walking Methodologies in a More-than-human World: WalkingLab. Routledge.

Şenel, A. (2013). Mapping as Performance: An Alternative to Authoritative Representations of Istanbul. Urbanistica Tre i Quaderni 3: Urban Representations.

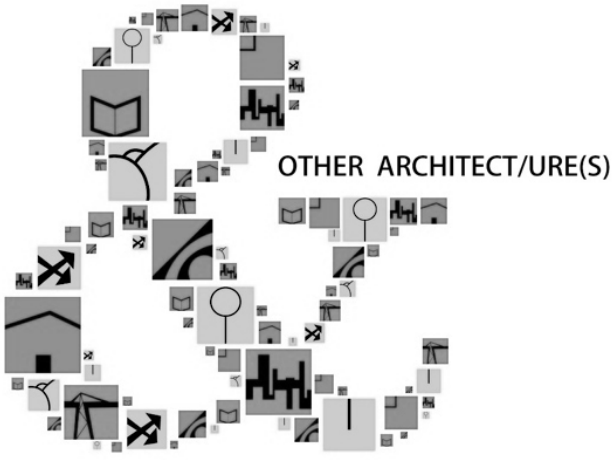
Tümerdem, M. (2018). Istanbul walkabouts: A critical walking research of Northern Istanbul (Doctoral thesis, Istanbul Technical University, Istanbul). Retrived from YÖK Ulusal Tez Merkezi. (542754)

Yücel, A. (2005). Mimarlıkta dil ve anlam: Seminer. İstanbul: TMMOB Mimarlar Odası İstanbul Büyükkent Şubesi.

PART III

TECHNOLOGY / MATERIAL / SUSTAINABILITY

LIVENARCH VII
livable environments & architecture



7th International Congress
September 28-30 2021 Trabzon TURKEY

LIVENARCH **VII**
livable environments & architecture

DOVETAILED MASSIVE WOOD BOARD ELEMENTS FOR MULTI-STORY BUILDINGS

Hüseyin Emre ILGIN[1], Markku KARJALAINEN[2], Olli-Paavo KOPONEN[3]

[1]*Tampere University, Finland*
emre.ilgin@tuni.fi
[2] *Tampere University, Finland*
markku.karjalainen@tuni.fi
[3] *Tampere University, Finland*
olli-paavo.koponen@tuni.fi

ABSTRACT

Due to easy connection technique, airtightness, and high rigidity, engineered wood products (EWPs) e.g., Cross-laminated timber (CLT) can compete, especially in multi-story timber buildings. In EWPs, adhesives play an important role, particularly by helping to protect the wood, making the structure light and strong, and relieving expansion and contraction due to natural moisture. However, the use of adhesives raises some concerns about EWPs' sustainability, recyclability, and wider environmental impact. There is still room for a solution of solid and pure wood based on one of the oldest traditionally used joining methods, providing dovetailed massive wood board elements (DMWBE) that offer as healthy indoor air as possible without adhesives and metal binders. Numerous studies have been done in the literature on the technological, ecological, social, and economic aspects of EWPs in construction with different building solutions, but no attempt has been made to evaluate the technical performance of DMWBE in multi-story buildings. This research aims to create higher value-added circular economy opportunities to increase the competitiveness of Finnish large-scale industrial timber structures at the local level and to support European climate policy as part of bio-economy and sustainable development.

Key Words: Dovetail; Massive Wood; Wood Board Element; Wood Construction; Multi-Story Building.

INTRODUCTION

As a result of global urbanization, the trend to build more vertical cities, namely multi-story (2-story high or more) and tall buildings (over 8-story), has been becoming more suitable for changing lifestyles, economics, and urbanization (Hewitt and Graham, 2015; Harris, 2015; Ilgın, 2018; Ilgın et al., 2021a). Even Scandinavian cities could be now on the cusp of their high-rise revolution. Furthermore, building higher has been gradually gaining popularity as in the cases of many tall towers e.g., 180m Trigoni Tower 1, Finland; 237m Tellus Tower 1, Sweden; 320m Bestseller Tower, Denmark (CTBUH, 2021).

As a renewable material, wood is ecological and environmentally friendly: one cubic meter of growing wood can bind about one ton of CO_2 from the atmosphere, the mass of wood is about 500 kg/m^3, and about half of this mass is carbon (Tolppanen et al., 2013; Aaltonen, 2019). Forests are carbon sinks and wood products are carbon storage. Therefore, it is reasonable to use so much massive wood as possible particularly in multi-story construction (Ilgın and Karjalainen, 2021; Tulonen et al., 2021).

Moreover, due to its substantially lower carbon footprint and potential cost-effectiveness compared to traditional materials such as reinforced concrete and steel, and numerous positive impacts on the environment, accompanied by its technological advances; wood, in the form of EWPs, has come back to break into the multi-story building, and even tall building, utilization after more than a century (Kremer and Symmons, 2015; Toppinen et al., 2018a; Karjalainen et al., 2021). In multi-story wooden construction, Europe has been leading the way with many pioneering projects (CTBUH, 2021).

Before the early 1990s, most of the wooden buildings in European countries were limited to 1 or 2-story because of fire performance regulation restrictions (Xia et al., 2014); while in recent years, due to the national building regulations shifting from being prescriptive to functional or performance-based, multi-story wooden construction has been gaining acceptance in European countries (Östman and Källsner, 2011). Concordantly, a wide variety of EWPs is currently available on the market. They are gradually replacing conventional building materials for multi-story construction (Harte, 2017; Kuzman et al., 2018).

In this sense, the multi-story wooden buildings have been a new promising industry with a high capacity for supporting the bioeconomy and technologically refurbishing construction sector (Hurmekoski et al., 2018; Toppinen et al., 2018b; Karjalainen and Ilgın, 2021). They can contribute to social well-being both within primary production and within wood-based value-chains (Lähtinen et al., 2016). In this industry, as a growing market in Europe, EWPs e.g., CLT (cross-laminated timber, a prefabricated multi-layer EWP, manufactured from at least three layers of boards by gluing their surfaces together with an adhesive under pressure), glue-laminated timber (Glulam, made by gluing together several graded timber laminations with their grain parallel to the longitudinal axis of the section), LVL (laminated veneer lumber, made by bonding together thin vertical softwood veneers

with their grain parallel to the longitudinal axis of the section, under heat and pressure), MHM (Massiv-Holz-Mauer®, a timber wall construction material consisting of dried softwood joined with fluted aluminum nails that require neither glue nor chemical treatment) have had an important position with the production capacity of more than 5 million cubic meter/year (Guan et al., 2018).

Due to the easy coupling technique, airtightness, and high rigidity, EWPs e.g., CLT is competitive especially in multi-story wooden buildings (Karjalainen, 2017; Karjalainen, 2019). Similarly, Glulam external structural frame as a proven system for the buildings with over 10-story (Abrahamsen and Malo, 2014; Ramage et al., 2017) was used in the tallest wooden towers as in the cases of the 85m and 18-story Mjøstårnet in Norway (Figure 1), and 84m and 24-story HoHo in Austria (HoHo, 2021) (Figure 2).

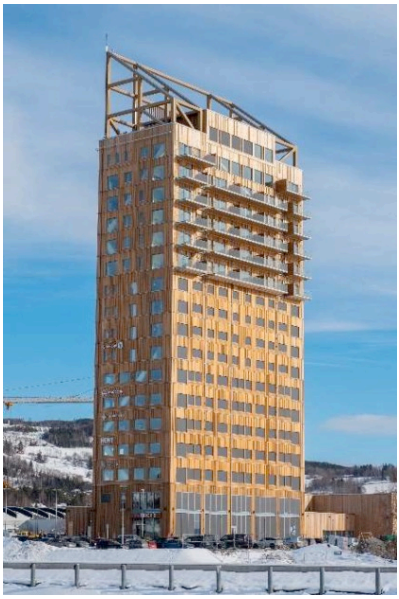


Figure 1. Mjøstårnet (Norway, 2019) (Source: Wikipedia)

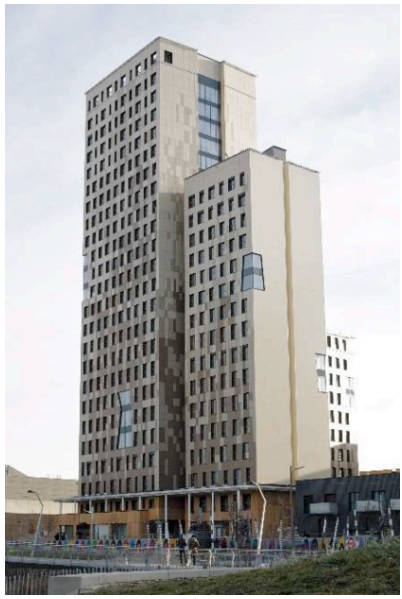


Figure 2. HoHo (Austria, 2020) (Source: Wikipedia)

In EWPs, adhesives play an essential role particularly by helping save wood, making the structure light and robust, and moderating the expansion and contraction due to the inherent moisture. On the other hand, the use of adhesives causes some concerns about their sustainability, recyclability, and broader environmental impact (Chang and Nearchou, 2014; Guan et al., 2018).

Because of toxic gas emissions (e.g., formaldehyde and Volatile Organic Compounds) during their lifespan and while burning, resulting from their petroleum-based contents, the dominant use of adhesives has adverse effects on the environment e.g., climate change, air pollution, and human health (Hemmila, 2017; Adhikari and Ozarska, 2018). Furthermore, there

are still critical questions about environmentally friendly biobased adhesives despite continuing advancements in this research area (Norström et al., 2015; Hemmila, 2017).

Besides several regulatory standards (California Air Resources Board, 2009; WHO, 2010; BS EN 13986, 2015) addressing the points mentioned above, the European Commission (2011) has a specific objective of improving air quality, which can also be achieved by reducing the use of harmful adhesives. In addition to these detrimental substances, metal connectors used in EWPs harm their end-of-life disposal, reusability, and recyclability (Sotayo et al., 2020). Thus, there is still room for a solution that is solid and completely pure wood enabling as healthy indoor air as possible, adhesive-&metal-connectors-free DMWBE based on one of the oldest joining methods used traditionally.

In the literature, numerous studies have been conducted on the technological, ecological, social, and economic aspects of EWPs in the construction with different building solutions (Toivonen and Lähtinen, 2019) however, no studies have attempted to evaluate the technical performance of DMWBE in multi-story or tall construction (Ilgın et al., 2021b). Overall, this research aims to increase the competitiveness of Finnish large-scale industrial wooden construction at the local level and to create higher value-added circular economy opportunities in support of European climate policy as part of the bio-economy and sustainable development.

To achieve this goal, DMWBE for multi-story buildings to the global market as a replacement of conventional EWPs e.g., CLT, Glulam will be developed by enabling the confidence of its technical performance and suitability within the interdisciplinary collaborations among architecture, structure, and building physics in the DoMWoB project (see Acknowledgement). Within the scope of the project, the design, construction, testing, and finally market research of DMWBE in multi-story constructions will be provided.

Geometrically original and structurally-sound digital models and built prototypes; laboratory tested and optimized prototypes in terms of structural, fire, sound insulation, and moisture transfer resistance & airtightness, and finally, finding out a proper production plant for DMWBE are among expected outcomes mainly through technical performance laboratory tests as well as architectural and structural design software.

This approach incorporates traditional techniques and advanced research, eliminates the use of toxic adhesives and metal fasteners, and leads to better reusability and recyclability, availability, and faster processing of wood for large-scale production (Ilgın et al., 2021b). It would also contribute to the uptake of DMWBE for more diverse and advanced structural applications and subsequently yield both environmental and economic benefits.

HISTORICAL BACKGROUND OF DOVETAIL JOINT TECHNIQUE

In history, the dovetail technique is a joinery method most used in woodwork (i.e., carpentry), including furniture, cabinets, log buildings, and traditional wood-framed structures. The history of the dovetail joint technique goes back to before Christ. Some of the earliest well-known examples of this technique were in ancient Egyptian furniture buried with mummies dating from the First Dynasty, stone pillars at the Temples in India (Figure 3) as well as Japanese and Korean traditional buildings (Sumiyoshi and Matsui, 1990; Pang et al., 2011). Besides these, this technique was utilized in Chinese ancient architecture (Zhang et al., 2018; 2019), where the dovetail joint was introduced - national building codes and construction methods in Song Dynasty in 1103 - as one of the primary joint methods employed in the oldest timber buildings in China (Yingzao Fashi, 1998). Additionally, during the earliest times to the Middle Ages, in Egypt, the construction of cabinets was based on the mortise and tenon, dovetail, and mitred joints (Rivers and Umney, 2003). In Europe, the dovetail joint is also called a swallowtail joint, a culvertail joint, or a fantail joint (Routledge French Technical Dictionary, 1994).

Figure 3. A stone pillar (Source: Wikipedia)

The first residential constructions with wood-framed structures from the 13th century consisted of mortise and tenon joints, strengthened with wedges, notched joints with tenons, and dovetail joints (Jasieńko et al., 2014). Notable examples of connecting the roof rafter and beams involved in making use of the dovetail joint were churches in the 14th century (Jasieńko et al., 2014). The roof structure of the Church of St. Jacob in Torun (16th century) was one of the oldest preserved examples, which includes notched joints with dovetail tenons. Moreover, as Polish churches, the Church in Cewków (Figure 4) and the Church in Chotylub were among remarkable examples of wood-framed buildings with dovetail wall-corner joists from the 19th century.

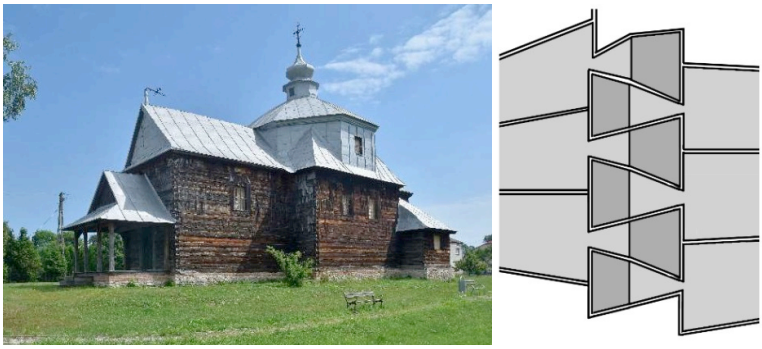


Figure 4. The Church in Cewków, Poland (left) (Source: Wikipedia) with dovetail corner detail (right)

Based on the skilled woodworkers' familiarity with design and manufacture, carpentry-type wood-to-wood joints were widely used in building construction till the mid-20th century (Tannert et al., 2012). Different dovetail designs in Europe and Asia often govern practical considerations. However, high labor costs and inadequacies due to excessively traditional designs rendered these joints uncompetitive. Advancements in computer numerical control (CNC) wood processing machines re-established the cost-effectiveness for carpentry-type wood-to-wood joints.

THE CURRENT STATE-OF-THE-ART OF DOVETAIL MASSIVE WOOD ELEMENTS

In the literature, thus far, there have been numerous studies regarding the technological aspects of timber in construction with different building solutions based on the utilization of engineered timber products such as CLT (Chiniforush et al., 2018; Toivonen and Lähtinen, 2019; Mohd Yusof et al., 2019; Li et al., 2021). However, there is a limited number of studies (e.g., Drdácký and Urushadze, 2019) on dovetail massive wood elements (DMWE). To date, previous studies about DMWE is based on a few papers mostly about structural analysis and model testing of several types of joint details rather than even evaluating overall technical performance (e.g., structural, fire, sound) of a structural component such as a column, a beam, a shear wall, or an entire structure (Ilgın et al., 2021b).

Among these most prominent studies conducted in the last decade, Jeong et al. (2012) scrutinized the effects of geometric variables on the mechanical behavior of dovetail connection (Figure 3) through finite element method analysis together with experimental tests. There different were parameters such as various tenon angles and tenon heights with three representative failure modes. The results showed that the geometry that maximizes the load-bearing capacity is the 57-degree tenon angle and the average allowable load for the dovetail joint is calculated as 21.4kN.

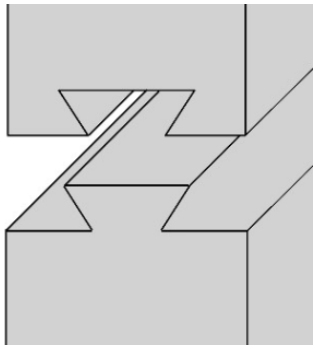


Figure 3. The dovetail joist for the test specimen

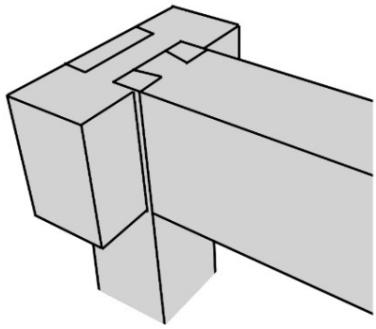


Figure 4. The dovetail joist for the test specimen

Also, failure modes of dovetail connection were dominated by tension perpendicular to the shear stress. Furthermore, planned failure criteria correlated with the critical stress played an important role in the projection of load-bearing capacity from dovetail connection.

Pang et al. (2012) studied the effects of size ratios on dovetail joints in Korean traditional timber building by examining moment resistance of various sizes of dovetail joints following experimental procedures together with dimensional analysis (Figure 4). It was observed that the average maximum and yield moment resistance was increased as the scale ratio was increased. As a result, moment resistance confirmed the similitude theory.

Tannert et al. (2012) presented various reinforcement methods (e.g., with self-tapping screws, with adhesive layer) to enhance the structural performance of rounded dovetail joints (Figure 5) under static short-term shear loading. Using the test series, comparisons between reinforced and non-reinforced joints were made to assess the potentials and limitations of different reinforcement methods. Based on the test results, adhesive-reinforced-rounded dovetail joints were proposed to improve structural performance under predefined loading conditions.

In the paper entitled ‘Interlocking Folded Plate - Integral Mechanical Attachment for Structural Wood Panels’, Robeller and Weinand (2015) built folded thin shell prototype consisting of timber panels by utilizing automatic fabrication of cabinetmaking joints, i.e., dovetail joints without adhesive (Figure 6). This interlocking arch prototype was constructed from 21mm LVL

panels and 12mm plywood with a self-weight of 192 kg and a span of 3 meters to provide input on the load-carrying capacity of integrated joints. It was recommended that further research is needed for large-scale building applications.

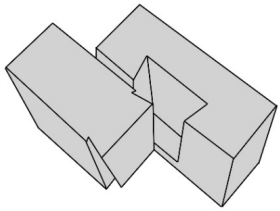


Figure 5. The rounded dovetail

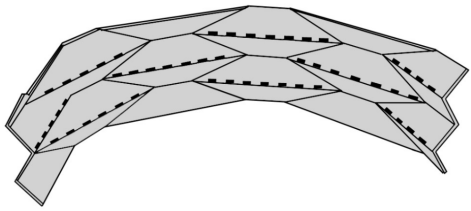


Figure 6. Folded-plate arch prototype joist for the test specimen

Pozza et al. (2014) simulated and tested structural behaviors of three massive wooden shear wall configurations including the cross-laminated-glued wall, cross-laminated-stapled wall, and layered wall with dovetail inserts under seismic loads. According to the results, all configurations had good dispersion capacity and could be employed well for seismically vulnerable zones. Similarly, Pozza et al. (2015) examined four massive wooden shear walls through experimental tests e.g., subjecting to compressive stress and numerical simulations. Analyzed shear wall configurations were CLT panels with glued interfaces together with massive timber panels adopting steel staples (stapled wall) or timber dovetail inserts to unite the layers (layered wall). Results indicated that all four variations offer a feasible construction technique for earthquake-prone zones.

Besides the abovementioned studies, other research showed that the critical aspects of the structure of the material and failure behaviors without considering the effects of material properties and geometric configurations (Jeong and Hindman, 2009; Jeong et al., 2010; Park and Lee, 2010).

RESEARCH METHOD

To generate geometrically original and structurally sound digital models, and built prototypes of DMWBE, architectural and structural design software will be utilized. After that, with the help of a wood factory in Finland, designed models will be turned into prototypes. As a next step, performance tests on structural properties, fire, sound insulation, and moisture transfer resistance and airtightness will be conducted at the University of Tampere and Turku University of Applied Sciences in Finland. Finally, national, and international timber construction organizations will be visited to meet with stakeholders (e.g., construction industry representatives, timber suppliers, public authorities) to find the right position for DMWBE in the current timber construction market in Finland and Europe.

CONCLUSION

This study aims to create higher value-added circular economy opportunities to increase the competitiveness of Finnish large-scale industrial timber structures at the local level and to support European climate policy as part of bio-economy and sustainable development.

To date, state-of-the-art DMWBE has only been examined on a member basis, or at most at the small-scale prototype level from a limited structural point of view, and mostly from a standpoint. theoretical framework. The literature on 'DMWE' is based on insufficient structural analysis and model testing of various connection details, rather than evaluating the performance of a structural component.

At present, although the uptake of DMWBE with adhesive and metal connector-free properties for commercial and structural applications is limited due to new research, for example, DoMWoB (Dovetailed Massive Wood Board Elements for Multi-Story Buildings) (see acknowledgments) (Figure 7), this innovative dovetail concept can be further used in multi-story construction.

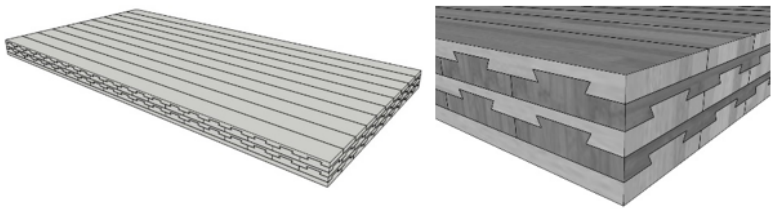


Figure 7. Dovetail massive wood board elements

ACKNOWLEDGEMENTS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No [101024593].

REFERENCES

Aaltonen, J.A. (2019). Viewpoints of Residential Multi-Story Construction Industry's Productivity, Environmental Regulations and Future in Finland, MSc Thesis, Forest Economics and Marketing Faculty of Agriculture and Forestry, University of Helsinki, May.

Abrahamsen, R.B. and Malo, K. (2014). Structural Design and Assembly of Treet - A 14- storey Timber Residential Building in Norway. In: Proceedings of the World Conference on Timber Engineering.

Adhikari, S. and Ozarska, B. (2018). Minimizing Environmental Impacts of Timber Products through the Production Process “From Sawmill to Final Products. Environ. Syst. Res. 7(1), 6.

BS EN 13986. (2015) Wood-based Panels for Use in Construction - Characteristics, Evaluation of Conformity and Marking. British Standards Institution, London.

California Air Resources Board, Airborne toxic control measure to reduce formaldehyde emissions from composite wood products, 2009. Retrieved from https://www.arb.ca.gov/regact/2007/compwood07/fro-atcmfin.pdf.

Chang, W.-S. and Nearchou, N. (2015). Hot-pressed Dowels in Bonded-in rod Timber Connections. Wood Fiber Sci. 47(2), (pp. 199-208)

Chiniforush, A., Akbarnezhad, A., Valipour, H., Xiao, J. (2018). Energy implications of using steel-timber composite (STC) elements in buildings. Energy & Buildings. 176, (pp. 203-215).

CTBUH. (2021). Council on Tall Buildings and Urban Habitat. Illinois Institute of Technology, S.R. Crown Hall, 3360 South State Street, Chicago, Illinois, USA. Retrieved from http://www.ctbuh.org.

Drdácký, M. and Urushadze, S. (2019). Retrofitting of Imperfect Halved Dovetail Carpentry Joints for Increased Seismic Resistance. Buildings. 9, 48. doi:10.3390/buildings9020048.

European Commission. (2011). A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.

Guan, Z., Sotayo, A., Oudjene, M., El Houjeyri, I., Harte, A., Mehra, S., Haller, P., Namari, S., Makradi, A., Belouettar, S., Deneufbourg, F. (2018). Development of Adhesive Free Engineered Wood Products - Towards Adhesive Free Timber Buildings, WCTE 2018, August 20-23, Seoul, Korea.

Harris, A. (2015). Vertical Urbanisms: Opening up Geographies of the 3-d City. Progress in Human Geography. 39(5) (pp.601-620).

Harte, A.M. (2017). Mass Timber-The Emergence of a Modern Construction Material. Journal of Structural Integration Maintenance. 2 (3) (pp.121-132).

Hemmila, V., Adamopoulos, S., Karlsson, O., Kumar, A. (2017). Development of Sustainable Bio-adhesives for Engineered Wood Panels-A Review. RSC Adv. 7 (61) (pp.38604-30).

Hewitt, L. and Graham, S. (2015). Vertical Cities: Representations of Urban Verticality in 20th century Science Fiction Literature. Urban Studies, 52(5) (pp.923-937).

HoHo (2020). Retrieved from http://www.hoho-wien.at/.

Hurmekoski, E., Pykäläinen, J., Hetemäki, L. (2018). Long-term Targets for Green Building: Explorative Delphi Backcasting Study on Wood-

frame Multi-story Construction in Finland, Journal of Cleaner Production, Vol. 172.

Ilgın, H.E. (2018). Potentials and Limitations of Supertall Building Structural Systems: Guiding for Architects. PhD Dissertation, Department of Architecture, Middle East Technical University, Ankara.

Ilgın, H.E. and Karjalainen, M. (2021). Perceptions, attitudes, and interest of architects in the use of engineered wood products for construction: A review, Engineered Wood Products for Construction, IntechOpen, (DOI: 10.5772/intechopen.98588).

Ilgın, H.E., Ay, B.O., Gunel, M.H. (2021a). A Study on Main Architectural and Structural Design Considerations of Contemporary Supertall Buildings, Architectural Science Review, Vol. 64, Issue 3, p. 212-224.

Ilgın, H.E., Karjalainen, M., Koponen, O. (2021b). Review of the current state-of-the-art of dovetail massive wood elements, Engineered Wood Products for Construction, IntechOpen (DOI: 10.5772/intechopen.99090).

Jasieńko, J., Nowak, T., Karolak, A. (2014). Historical carpentry joints, Journal of Heritage Conservation, 40.

Jeong, G.Y. and Hindman, D.P. (2009). Ultimate Tensile Strength of Loblolly Pine Strands Using Stochastic Finite Element Method. J. Mater. Sci. 44, 14, (pp. 3824-32).

Jeong, G.Y., Hindman, D.P., Zink-Sharp, A. (2010). Orthotrpic Properties of Loblolly Pine Strands. J. Mater. Sci. 45, 21, (pp. 5820-30).

Jeong, G.Y., Park, M-J., Hwang, K., Park, J.S. (2012). Effects of Geometry on Mechanical Behavior of Dovetail Connection, WTCE, World Conference on Timber Engineering, July 15-19, Auckland, New Zealand.

Karjalainen, M. (2017). Status and Possibilities of Timber Construction in Finland, 15 May 2017, Wood-based Bio-economy Solving Global Challenges. Lilja, K. (ed.). Helsinki: Ministry of Economic Affairs and Employment of Finland, Vol. MEAE 2/2017 (pp.35-39).

Karjalainen, M. (2019). A Study of the Finnish Multi-story Timber Frame Buildings 1995-2018 S. ARCH 2019; 6th International Conference on Architecture and Engineering, Havana, Cuba; 5-7, March 2019.

Karjalainen, M. and Ilgın, H.E. (2021). The Change over Time in Finnish Residents' Attitudes towards Multi-Story Timber Apartment Buildings, Sustainability, 13(10), 5501.

Karjalainen, M., Ilgın, H.E., Tulonen, L. (2021). Main Design Considerations and Prospects of Contemporary Tall Timber Apartment Buildings: Views of Key Professionals from Finland, Sustainability, 13(12), 6593.

Kremer, P.D. and Symmons, M.A. (2015). Mass Timber Construction as an Alternative to Concrete and Steel in the Australia Building Industry: A PESTEL Evaluation of the Potential, International Wood Products Journal, Vol. 6, No. 3.

Kuzman, M.K., Sandberg, D., Haviarova, E. (2018). Architects´ Perception of EWPs and Modified Wood in Contemporary Timber Architecture, WTCE 2018, 2018 World Conference on Timber Engineering, August 20-23, Seoul, Republic of Korea.

Li, M., Zhang, S., Gong, Tian, Z., Ren, H. (2021). Gluing Techniques on Bond Performance and Mechanical Properties of Cross-Laminated Timber (CLT) Made from Larix kaempferi, Polymers. 13, 733.

Lähtinen, K., Toppinen, A., Mikkilä, M., Toivio, M. and Suur-Uski, O. (2016). Corporate Responsibility Reporting in Promoting Social License to Operate in the Forestry and Sawmilling Industries. Forestry, 89(5) (pp. 525-541).

Mohd Yusof N., Md Tahir, P., Lee, S.H., Khan, M.A., Mohammad Suffian James, R. (2019). Mechanical and physical properties of Cross-Laminated Timber made from Acacia mangium wood as function of adhesive types. J. Wood Sci.

Norström, E., Fogelström, L., Nordqvist, P., Khabbaz, F., Malmström, E. Xylan, A. (2015). green binder for wood adhesives. Eur. Polym. J. 67 (pp.483-493).

Pang, S-J., Oh, J-K., Park, C-Y., Lee, J-J. (2011). Influence of crossing-beam shoulder and wood species on moment-carrying capacity in a Korean traditional dovetail joint. Journal of Wood Science. 57 (pp.195-202).

Pang, S-J., Oh, J-K., Park, C-Y, Lee, J-J. (2012). Effects of Size Ratios on Dovetail Joints in Korean Traditional Wooden Building, WTCE, World Conference on Timber Engineering, July 15-19, Auckland, New Zealand.

Park, C.Y. and Lee, J.J. (2010). Moment Carrying Capacity of Dovetailed Mortise and Tenon Joints with or without Beam Shoulders, J. Struct. Eng. ASCE. 137, 7, (pp. 785-789).

Pozza, L., Scotta, R., Trutalli, D., Pinna, M., Polastri, A., Bertoni, P. (2014). Experimental and Numerical Analyses of New Massive Wooden Shear-Wall Systems. Buildings. 4, (pp. 355-374).

Pozza, L., Scotta, R., Trutalli, D., Polastri, A. (2015). Behaviour factor for innovative massive timber shear walls, Bull Earthquake Eng. 13, (pp. 3449-3469).

Rivers, S. and Umney, N. Conservation of Furniture. (2003). Oxford, England: Routledge.

Ramage, M.H., Burridge, H., Busse-Wicher, M., Fereday, G., Reynolds, T., Shah, D.U., Wu, G., Yu, L., Fleming, P., Densley-Tingley, D.,

Allwood, J., Dupree, P., Linden, P.F., Scherman, O. (2017). The wood from the trees: The Use of Timber in Construction, Renewable and Sustainable Energy Reviews 68.

Robeller, C. and Weinand, Y. (2015). Interlocking Folded Plate - Integral Mechanical Attachment for Structural Wood Panels, International Journal of Space Structures.

Routledge French Technical Dictionary. (1994).1. London: Routledge. 1994. (ISBN 9780415112253)

Östman, B. and B. Källsner. (2011). National Building Regulations in Relation to Multi-Storey Wooden Buildings in Europe. School of Technology and Design Reports, No. 60, Växjö, Sweden: Växjö University.

Sotayo, A., Bradley, D., Bather, M., Sareh, P., Oudjene, M., El-Houjeyri, I., M. Harte, A., Mehra, S., O'Ceallaigh, C., Haller, P., Namari, S., Makradi, A., Belouettar, S., Bouhala, L., Deneufbourg, F., Guan, Z. (2020). Review of state of the art of dowel laminated timber members and densified wood materials as sustainable engineered wood products for construction and building applications, Developments in the Built Environment 1. (pp.1-11).

Sumiyoshi, T. and Matsui, G. (1990). Wood Joists in Classical Japanese Architecture, Kajima Institute Publishing Co. Ltd., Japan.

Tannert, T., Keller, N., Frei, R., Vallee, T. (2012). Improved Performance of Rounded Dovetail Joists, WTCE, World Conference on Timber Engineering, July 15-19, Auckland, New Zealand.

Toivonen, R. and Lähtinen, K. (2019). Sustainability - A Literature Review on Concealed Opportunities for Global Market Diffusion for the Cross-laminated Timber (CLT) in the Urbanizing Society. The manuscript for Bioproducts Business.

Tolppanen, J., Karjalainen, M., Lahtela, T., Viljakainen, M. (2013). Suomalainen puukerrostalo: rakenteet, suunnittelu ja rakentaminen. Helsinki: Opetushallitus: Puuinfo.

Toppinen, A., Autio, M., Sauru, M., Berghäll, S. (2018a). Sustainability-Driven New Business Models in Wood Construction towards 2030, in Filho, w. L., Pociovălișteanu, D. M., Borges de Brito, p. r. and Borges de Lima, I. (eds), Towards a Sustainable Bioeconomy: Principles, Challenges and Perspectives, Springer, Cham (pp.499-516).

Toppinen, A., Röhr, A., Pätäri, S., Lähtinen, K. and Toivonen, R. (2018b). Regulation or End-user Demand as Drivers for Sustainability? A Delphi Study on The Wooden Multistory Construction in Finland and Sweden Towards 2030, Journal of Forest Economics, 31. (pp. 3-10).

Tulonen, L., Karjalainen, M., Ilgın, H.E. (2021). Tall wooden residential buildings in Finland: What are the key factors for design and

implementation?, Engineered Wood Products for Construction, IntechOpen (DOI: 10.5772/intechopen.98781)

Xia, B., O'Neill, T., Zuoc, J., Skitmored, M. & Chene, Q. (2014). Perceived Obstacles to Multi-storey Timber-frame Construction: An Australian Study, Architectural Science Review, Vol. 57, No. 3 (pp.169-176)

World Health Organization. (2010). WHO Guidelines for Indoor Air Quality: Selected Pollutants. World Health Organization Regional Office for Europe, Copenhagen, Denmark.

Yingzao Fashi, Q.G. (1998). Twelfth-century Chinese building manual, Archit. Hist. 41, (pp 1-13).

Zhang, J., Yixiang, Xu, Y., Mei, F., Li, C. (2018). Experimental study on the fire performance of straight-line dovetail joints, Journal of Wood Science, 64, (pp. 193-208).

Zhang, J., Wang, Y., Linfeng, L., Xu, Q. (2019). Thermo-mechanical behaviour of dovetail timber joints under fire exposure, Fire Safety Journal. 107, (pp. 75-88).

CONTEMPORARY TRENDS IN SUPERTALL BUILDING FORM: AERODYNAMIC DESIGN CONSIDERATIONS

Hüseyin Emre ILGIN[1], Mehmet Halis GÜNEL[2]

[1] Middle East Technical University, Turkey
hemreilgin@gmail.com
[2] Middle East Technical University, Turkey
hgunel@metu.edu.tr

ABSTRACT

Using the digital tools and computational techniques during the architectural design process, supertall building (over 300m high or 75 stories) forms have been evolving towards inspiring various architectural styles through the exploration of new morphological schemes. Contemporary trends in extraordinary form treatments are searching for the improvement of building performance through decreasing material use, cost, energy consumption, and mitigating wind-induced building motion. The main objective at the end of these profound efforts is to satisfy building sustainability, environmental consciousness, and structural and aerodynamic efficiency. As the height of today's supertall buildings rises owing to developments in structural systems and utilization of high-strength materials, their weight and rigidity decrease, and so the slenderness and flexibility; thus, leading to sensitivity to wind loads. In the design of supertall buildings, wind loads play a critical role because they generally cause large lateral drift, floor acceleration, and mostly dominate over earthquake loads. In this context, building form plays a vital role in aerodynamic behavior and so the wind response of supertall buildings. Consequently, aerodynamic design considerations are strongly recommended to be considered in the early/schematic design and planning stages of supertall buildings. This study investigates the significant role of aerodynamic design considerations categorically and proposes a supertall building form classification from morphological and aerodynamic points of view. The proposed classification is believed to be more definite and comprehensive and hence serves better for categorizing supertall buildings compared to its counterparts existing in the literature.

Key Words: Supertall Building; Building Form; Aerodynamic Design Considerations.

INTRODUCTION

In literature, several numbers of studies have been focused on contemporary trends in aerodynamic design considerations of supertall buildings. Among these, Ilgın (2006) aimed to create basic design guidance for tall buildings in terms of their aerodynamic modifications as a resource for architects, engineers, and other related parties. Ilgın and Gunel (2007) reviewed also aerodynamic design strategies against wind excitation in tall buildings from an architectural point of view with representative examples.

Amin and Ahuja (2010) scrutinized numerous aerodynamic modifications on building form and corner geometry to mitigate wind excitation of tall buildings with related examples across the world. Tanaka et al. (2013) examined aerodynamic characteristics particularly regarding across-wind excitations of recent tall buildings with unconventional forms and various configurations. Xie (2014) investigated the aerodynamic optimization of supertall building design by evaluating the efficiency of tapered, stepped, and twisted forms. Alaghmandan et al. (2014) presented the future trend of the architectural form including aerodynamic and structural design considerations with 73 supertall buildings built by the end of 2012. In the book “Tall Buildings: Structural Systems and Aerodynamic Forms” Gunel and Ilgın (2014a) underlined aerodynamic-based design as an architectural design approach to control wind-induced building sway and ensure the functional performance of tall buildings. As contemporary research, Mooneghi and Kargarmoakhar (2016) and Sharma et al. (2018) scrutinized studies on several aerodynamic modifications and shape optimization techniques utilized for decreasing wind loads on buildings by changing their forms at minor and major levels.

Compared to all the above-mentioned studies in the literature, this paper is believed to be more definite and comprehensive, and hence serve better for categorizing supertall building forms not only morphologically but also aerodynamically in the light of a comprehensively retrospective look in particular at the last two decades with an emphasis on the recently built examples. On the other hand, the classification for the aerodynamic modification part that was previously presented by the authors (Ilgın and Gunel, 2007) has been modified, updated, and elaborated in this paper by adding the more recent aerodynamic treatments like air passes and contemporary representative supertall building examples.

SUPERTALL BUILDING FORMS

A supertall building form can be divided into three sections: top/head, main body/tower, base (Figure 1). The tripartite design concept originating in the late 19th century, best exemplified in Chrysler Building (New York, 1930), suggests that a skyscraper should have a distinct top (crown), middle (shaft), and base (podium) (Al-Kodmany and Ali, 2016; Ilgın, 2018; Ilgın et al., 2021). In the following, three main sections of the supertall building viewed vertically are discussed briefly.

- Base: This section is seen from street level and may rise to a height of 5- 10-story depending on the depth of the open space in front of the supertall building. Interfacing with the urban settings, this part is a critical determinant of the building's contextual quality. The 'base' configuration has a minor effect on the urban ecology because of its low height, while it has a major impact on the scale, the definition of the street, and the 'humanizing' image of the building (Ali and Armstrong, 1995).
- Main body/tower: This section extends from the building's base to the top. The 'main body/tower' configuration has a critical effect on the quality of interaction between the building and eco-environmental conditions like the air movement in its surroundings and in the perception of building scale.
- Top/head: This section generally has a reduced footprint and so it has a minor impact on the eco-environmental condition of the building compared to the main body section. The 'top/head' highlights the building's own identity and is perfectly formed by formal influences of both the lower sections and the city's skylines (Macmillan and Metzstein, 1974). In this paper, building form classification is based essentially on the 'main body/tower' configuration.

In this study, compared to other studies in the literature (Voller, 2008; Al-Kodmany and Ali, 2016; Ilgın, 2018; Ilgın, 2021; Ilgın et al., 2021), the following proposed classification is believed to be more definite and comprehensive and hence serve better for categorizing supertall buildings even for those having extraordinary forms.

- Prismatic forms [with(out) architectural top]
- Leaning/tilted forms
- Tapered forms
  - continuous-tapered forms (linear / nonlinear-tapered)
  - noncontinuous-tapered forms
- Setback forms
- Twisted forms
  - linear-twisted
  - nonlinear-twisted
- Free forms
  - sculptural free forms
  - articulated (modular) free forms

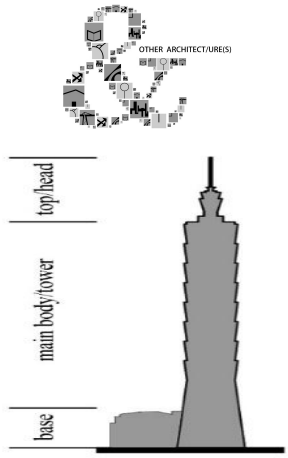


Figure 1. Sections of a typical supertall building

Prismatic forms

This category refers to buildings with a prismatic form whose two ends are similar, equal, and parallel figures, whose sides are identical, and whose axles are fully vertical, namely perpendicular to the ground. In addition to this, they have an identical floor profile repeated through the entire height of the building. Prismatic forms can be divided into two groups according to having some minor architectural modification/articulation, particularly on the building head/top or not as follows: prismatic forms without architectural top as in the case of the 85-story, 426m high 432 Park Avenue (New York, 2015) (Figure 2a) and prismatic forms with an architectural top as in the cases of the 94-story, 452m high Changsha IFS Tower T1 (Changsha, 2018) (Figure 2b), 88-story, 392m high 23 Marina (Dubai, 2012) (Figure 2c), and 120-story, 601m high Makkah Royal Clock Tower (Mecca, 2012) (Figure 2d).

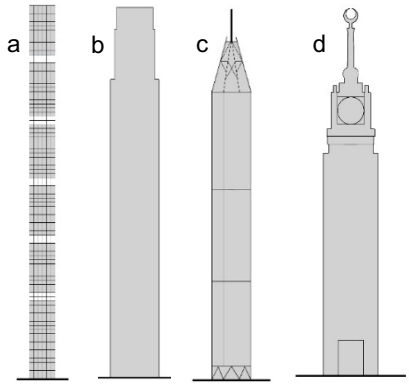


Figure 2. Prismatic forms (a) 432 Park Avenue, New York, 2015; (b) Changsha IFS Tower T1, Changsha, 2018; (c) 23 Marina, Dubai, 2012; (d) Makkah Royal Clock Tower, Mecca, 2012

Leaning/tilted forms

This category refers to buildings with an inclined form. Buildings have traditionally been constructed vertically, namely orthogonal to the ground. When a building is constructed in a tilted form, it is typically an indication of some serious problems that occurred to the building as in the case of Tower of Pisa suffering from differential settlements. Today, leaning/tilted forms have never been encountered in the supertall buildings, while these forms are intentionally utilized to generate more dramatic architecture for tall buildings as in the cases of the 26-story, 114m high Puerta de Europa Complex (Madrid, 1996) with an inclination of 15° (Figure 3a), and Signature Towers (Dubai, proposed) (Figure 3b), which are the most remarkable examples of leaning tall buildings of the contemporary era. Leaning profile can be either linear or nonlinear. Some leaning forms with a nonlinear profile can be categorized as free forms, too.

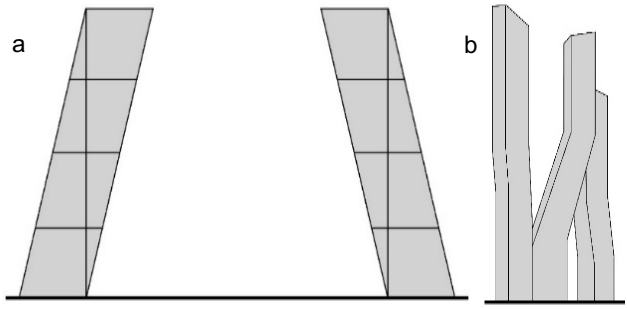


Figure 3. Leaning/tilted forms (a) Puerta de Europa Complex, Madrid, 1996; (b) Signature Towers, Dubai, proposed

Tapered forms

This category refers to buildings with a tapering effect by reduced floor plans and surface areas through the height. In the tapered form, the floor plan dimensions are reduced constantly as the building rises. The pyramidal form can be accepted as the most basic type of tapered form with the first example as the ancient pyramids in Egypt. Tapered forms can be divided into two groups: continuous-tapered (can be linear or nonlinear) and noncontinuous-tapered. Continuous tapered, namely tapering effect continuously through the building height as in the case of the 94-story, 541m high One World Trade Center (New York, 2014) with a subgroup of either linear as in the case of the 167-story, 1000+m high Jeddah Tower (Jeddah, under construction) (Figure 4a) or nonlinear as in the case of the 83-story, 310m high Ocean Heights (Dubai, 2010) (Figure 4b), noncontinuous-tapered, namely tapering effect interrupted through the building height as in the cases of the 115-story, 599m high Ping An Finance Center (Shenzhen, 2017) (Figure 4c) and the 77-story and 320m 53 West 53rd (New York, under construction) (Figure 4d).

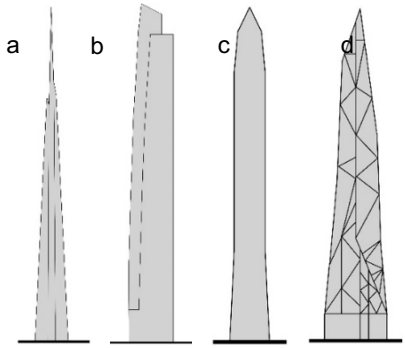


Figure 4. Tapered forms (a) Jeddah Tower, Jeddah, under construction; (b) Ocean Heights, Dubai, 2010; (c) Ping An Finance Center, Shenzhen, 2017; (d) 53 West 53rd, New York, under construction

Setback forms

This category refers to buildings with recessed horizontal sections throughout the height of the building. Namely, in the setback form, the plan dimensions are reduced at certain levels as the building rises.

- the 163-story, 828m high Burj Khalifa (Dubai, 2010) (Figure 5a),
- the 117-story, 442m high World One (Mumbai, on hold) (Figure 5b),
- the 98-story, 423m high Trump International Hotel and Tower (Chicago, 2009) (Figure 5c),
- the 60-story, 300m high Abeno Harukas (Osaka, 2014) (Figure 5d), are remarkable examples of supertall buildings with setback forms.

On the other hand, the masterpieces from the 1930s such as Empire State Building (New York, 1931) and Chrysler Building (New York, 1930) also utilized progressive setbacks of the base, main body, and top to satisfy zoning laws to diminish the shadow on neighboring buildings.

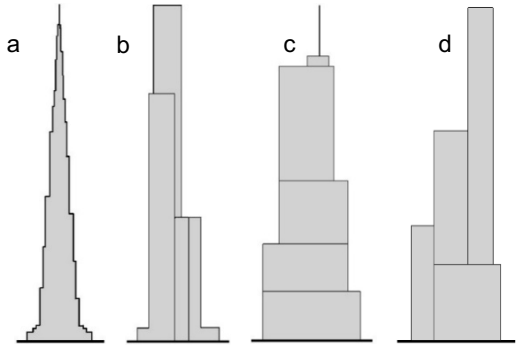


Figure 5. Setback forms (a) Burj Khalifa, Dubai, 2010; (b) World One, Mumbai, under construction; (c) Trump International Hotel and Tower, Chicago, 2009; (d) Abeno Harukas, Osaka, 2014

Twisted forms

This category refers to buildings with progressively rotating floors or their façade as they multiply upward along an axis by inputting a twist angle. Typically, but not always, each plate is shaped similarly in plan and is turned on a shared axis with a consistent number of degrees from the floor below. Twisted forms can be divided into two groups as follows: linear-twisted and nonlinear-twisted.

- linear-twisted, which is a result of rotating each floor with the one below it according to a constant value, as in the cases of the 73-story, 376m high Cayan Tower (Dubai, 2013) (Figure 6a) and the 70-story, 330m high Shimao Qianhai Project Tower 1 (Shenzhen, under construction) (Figure 6b)
- nonlinear-twisted, which is a result of applying a deformer to the linear twist, as in the case of the 150-story, 607m high Chicago Spire (Chicago, never completed) (Figure 6c).

Twisted form variations could be generated also by applying a taper, called 'tapering twisted form' as in the case of the 86-story, 462m high Lakhta Center (St. Petersburg, under construction) (Figure 6d).

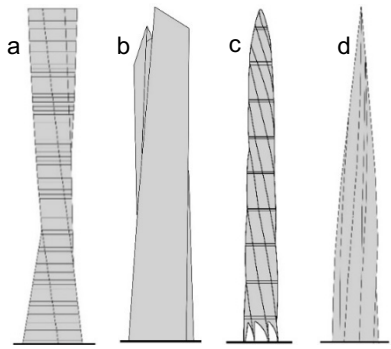


Figure 6. Twisted forms (a) Cayan Tower, Dubai, 2013; (b) Shimao Qianhai Project Tower 1, Shenzhen, under construction; (c) Chicago Spire, Chicago, never completed; (d) Lakhta Center, St. Petersburg, under construction

Free forms

This category refers to buildings with free forms which is out of the abovementioned forms. Free forms may emerge with various design inspirations and objectives by the architects, engineers, and owners as well.

In this research, the following classification is based on the configuration of the free forms:

- Sculptural free forms as in the cases of the 80-story, 413m high Al Hamra Tower (Kuwait City, 2011) (Figure 7a), the 80-story, 383m high Eton Place Dalian Tower 1 (Dalian, 2016) (Figure 7b), and the

54-story, 234m high CCTV Headquarters (Beijing, 2012) (Figure 7c),

- Articulated (modular) free forms as in the case of the 101-story, 508m high TAIPEI 101 (Taipei, 2004) with bamboo shape (Figure 7d).

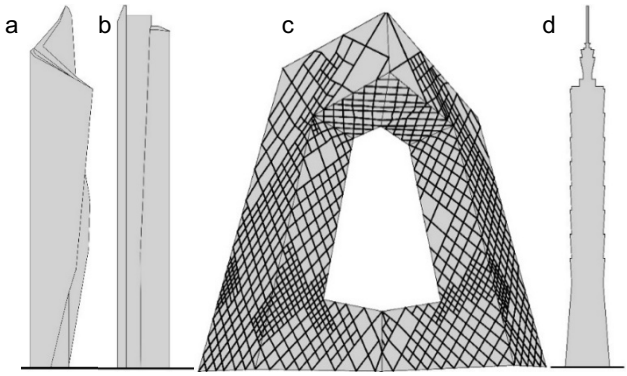


Figure 7. (a) Al Hamra Tower, Kuwait City, 2011; (b) Eton Place Dalian Tower 1, Dalian, 2016; (c) CCTV Headquarters, Beijing, 2012; (d) TAIPEI 101, Taipei, 2004

AERODYNAMIC DESIGN CONSIDERATIONS

As the height of today's supertall buildings rises owing to developments and advancements of new engineering and construction techniques, and high-grade materials, their weight and rigidity decrease, and their slenderness, flexibility, and damping increase - so supertall buildings become vulnerable to particularly wind-induced lateral loads (Kareem et al., 1999; Kim and Kanda, 2008; Sharma et al., 2018). The wind-induced building response of supertall buildings can be mitigated through aerodynamic design considerations that change the flow pattern around the building or break up the wind affecting the building (Gunel and Ilgın, 2014b).

Even though the form and orientation of buildings are generally determined by architectural and practical considerations, for tall buildings particularly supertall buildings, aerodynamic design considerations become critical design inputs for shaping and positioning the building because of dramatically increasing wind-induced loads as the height increases. In this context, these considerations, which are strongly recommended to be considered in the early/schematic design and planning stages of supertall buildings (Davenport, 1971; Schueller, 1977; Kareem et al., 1999; Ilgın and Gunel, 2007; Irwin, 2009; Alaghmandan et al., 2013; Gunel and Ilgın, 2014a-b; Mooneghi and Kargarmoakhar, 2016; Sharma et al., 2018; Ilgın, 2018).

Aerodynamic design considerations can be divided into two groups as follows:

- Major modifications
  - building orientation
  - aerodynamic form
  - plan variation
  - aerodynamic top
- Minor modifications
  - corner modifications
  - air passes

Major modifications

Major modifications including “building orientation”, “aerodynamic form”, “plan variation”, and “aerodynamic top” could noticeably change the overall architectural design. These modifications play an important role in reducing the effect of wind on supertall buildings (Schueller, 1977; Ali and Armstrong, 1995; Kareem et al., 1999; Holmes, 2001; Scott et al., 2005; Irwin et al., 2006; Ilgın and Gunel, 2007; Irwin et al., 2008a; Irwin et al., 2008b; Irwin, 2009; Gunel and Ilgın, 2014a-b; Al-Kodmany and Ali, 2016). The reduction resulting from major modifications is generally in the region of 20-30%, but can even exceed 50% (Scott et al., 2005; Kim et al., 2008).

Building orientation

To reduce wind loads, building orientation by taking into consideration the prevailing wind direction is an effective method (Gunel and Ilgın, 2014b). Wind climate and building form play a vital role in the efficiency of this method. Rotation of building to within 10º of the wind direction could provide a reduction of between 10-20% of the across-wind building response (Scott et al., 2005).

Aerodynamic form

Gradually, architects and engineers are interested in creating aerodynamic forms that streamline the wind flow to improve a supertall building’s performance regarding wind resistance, in particular, higher altitudes where wind forces become amplified. In this context, cylindrical, elliptical, conical, and twisted forms could be accepted among the efficient building forms.

Since cylindrical buildings have a smaller surface perpendicular to the wind direction, the wind pressure is less than in prismatic buildings. When compared with the buildings having a rectangular plan form; triangular, elliptical, and circular plan forms are less susceptible to the wind loads (Lee, 1990; Nakamura, 1993; Taranath, 2005; Irwin, 2008). In addition to this, buildings having an elliptical form also show similar behavior to buildings having a circular plan form (Schueller, 1977).

Although the availability of researches scrutinizing the effects of twisting the building on the wind loads is limited in the literature (Kelly et al., 2012); it can be said that for the across-wind direction, particularly, twisted and irregular free forms generally perform better than a comparable prismatic one, as they can mitigate wind-induced vibrations by disturbing the

development of organized alternating vortexes (Park, 2005; Amin and Ahuja, 2010; Moon, 2011; Moon, 2015a).

Examples of supertall buildings with aerodynamic forms include:

- the 128-story, 632m high Shanghai Tower (Shanghai, 2015) (Figure 8a) with reduced wind-induced lateral loads by 24% (Amin and Ahuja, 2010; CTBUH; Sharma et al., 2018) and the 73-story, 306m high Cayan Tower (Dubai, 2013) (Figure 6a) (Sharma et al., 2018) with reduced across-wind excitation by some 25% or more (Baker et al., 2010), both of which have twisted forms,
- the 103-story, 439m high Guangzhou International Finance Center (Guangzhou, 2010) (Figure 8b) with its free form (Wilkinson, 2012; Kwok and Lee, 2016; Wilkinson, 2016),
- the 80-story, 413m high Al Hamra Tower (Kuwait, 2011) (Figure 7a) with its sculptural free form (Ahci and Sarkisian, 2011),
- the 76-story, 385m high PIF Tower (Riyadh, under construction) (Figure 8c) with its free form (Soto and Al-Shihabi, 2015),
- the 77-story, 358m high Greenland Suzhou Center (Wujiang, under construction) (Figure 8d) with its elliptical form (Wimer et al., 2012),
- the 71-story, 309m high Pearl River Tower (Guangzhou, 2013) (Figure 8e) with its aerodynamic sculpted curvilinear form (Daraphet, 2013; Tomlinson II et al., 2014)

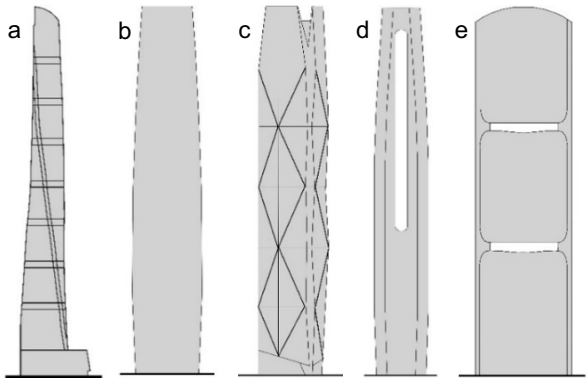


Figure 8. Aerodynamic form (a) Shanghai Tower, Shanghai, 2015; (b) Guangzhou International Finance Center, Guangzhou, 2010; (c) PIF Tower, Riyadh, under construction; (d) Greenland Suzhou Center, Wujiang, under construction; (e) Pearl River Tower, Guangzhou, 2013

Plan variation

Reducing the plan area through the building height, namely plan variation, is an effective method for reducing wind loads. Utilization of tapered and setbacks forms is an effective method to reduce the across-wind building response (Schueller, 1977; Ali and Armstrong, 1995; Cooper et al., 1997; Kim and You, 2002; Scott et al., 2005; Irwin, 2008; Irwin et al., 2008a; Irwin et al., 2008b; Kim et al., 2008; Irwin, 2009; Amin and Ahuja, 2010; Tanaka et al., 2013; Gunel and Ilgın, 2014a-b; Alaghmandan et al., 2014; Hansora

et al., 2015; Moon, 2015a; Moon, 2015b). Tapered form use in tall buildings could cause a noticeable reduction of up to 50% in the lateral drift (Schueller, 1977). A slope of 8% in a 40-story building façade can provide a 50% reduction of the lateral drift in the upper stories (Khan, 1972). Moreover, tapered forms decrease the downward wash of turbulent wind gusts that often exists around tall buildings (Nordenson and Riley, 2003; Park, 2005). Examples of tapered supertall buildings include:

- the 167-story, 1000+m high Jeddah Tower (Jeddah, under construction) (Figure 4a) (Weismantle and Stochetti, 2013),
- the 101-story, 492m high Shanghai World Financial Center (Shanghai, 2008) (Figure 9a),
- the 97-story, 530 m high Tianjin CTF Finance Center (Tianjin, under construction) (Figure 9b) (Lee et al., 2016),
- the 126-story, 636m high Wuhan Greenland Center (Wuhan, under construction) (Figure 9c) (Viise et al., 2012),
- the 94-story, 428m high Haikou Tower 1 (Haikou, under construction) (Figure 9d) (Henn, 2016),
- the 115-story, 599m high Ping An Finance Center (Shenzhen, 2017) (Figure 4c) (Xie and Ai, 2016),
- the 94-story, 541m high One World Trade Center (New York, 2014) (Lewis and Holt, 2011).

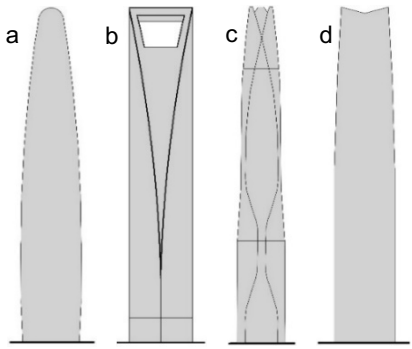


Figure 9. Plan variation (a) Shanghai World Financial Center, Shanghai, 2008; (b) Tianjin CTF Finance Center, Tianjin, under construction; (c) Wuhan Greenland Center, Wuhan, under construction; (d) Haikou Tower 1, Haikou, under construction

Aerodynamic top

The creation of an aerodynamic form near the top of the building is the basis of this approach, which includes tapering the upper part of the building by gradually reducing the plan area and/or generating wind openings.

Utilization of aerodynamic top provides improvements not only in the along-wind but also in the across-wind building response by decreasing the effect of wind-induced turbulence (Dutton and Isyumov, 1990; Isyumov et al., 1992; Kareem et al., 1999; Ho, 2007; Irwin et al., 2008a; Irwin et al., 2008b; Irwin, 2009; Gunel and Ilgın, 2014a-b). To reduce the across-wind response

of the building, the optimum location for the along-wind openings is positioned between 80% and 90% of the building height (Kikitsu and Okada, 2003).

Examples of supertall buildings with an aerodynamic top include:

- the 88-story, 412m high Two International Finance Centre (Hong Kong, 2003) (Figure 10a),
- the 101-story, 492m high Shanghai World Financial Center (Shanghai, 2008) (Figure 10b), (Kareem et al., 1999; Ho, 2007),
- the 41-story, 302m high Kingdom Centre (Riyadh, 2002) (Figure 10c) (Amin and Ahuja, 2010).

Among these examples, an aerodynamic top consisting of trapezoidal wind openings played an important role in the architectural design of the Shanghai World Financial Center (Kareem et al., 1999; Moon, 2015b). The efficiency of this modification reduces if the openings are positioned at lower levels of the building.

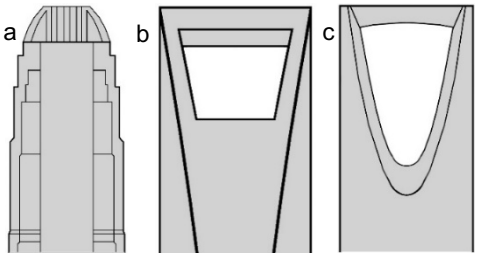


Figure 10. Aerodynamic top (a) Two International Finance Centre, Hong Kong, 2003; (b) Shanghai World Financial Center, Shanghai, 2008; (c) Kingdom Centre, Riyadh, 2002

Minor modifications

Minor modifications including “corner modifications” and “air passes” do not considerably change the overall architectural design.

Corner modifications

In the buildings with sharp - 90º corners - the vortex shedding phenomenon can develop, causing an unpleasant acceleration (Macklowe, 2015). In this context, modifications to corner geometry using recessed/notched, cut, slotted, and rounded corners (Figure 11) can reduce the along-wind and across-wind building response to an important degree (Melbourne and Cheung, 1988; Melbourne, 1989; Kwok, 1995; Kawai, 1998; Tamura, 1999; Gu and Quan, 2004; Scott et al., 2005; Kumar et al., 2006; Irwin et al., 2008a; Irwin et al., 2008b; Kim et al., 2008; Irwin, 2009; Tse et al., 2009; Malott, 2010; Amin and Ahuja, 2010; Lewis and Holt, 2011; Malott and KPF Ass., 2014; Gunel and Ilgın, 2014a-b; Tang, 2016; Elshaer et al., 2017).

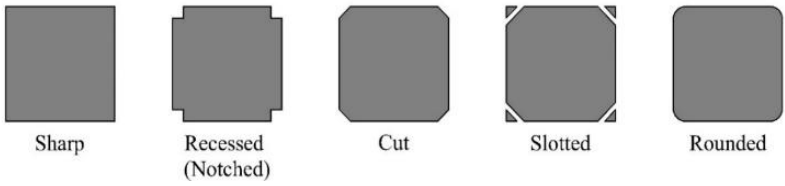


Figure 11. Modifications to corner geometry

Horizontal slots, slotted corners, and cut corners could cause major disruption of the vortex-shedding process and result in a 30% or more reduction in the across-wind response (Kim and Kanda, 2008; Amin and Ahuja, 2010). In addition to this, a significant amount of along-wind loads up to 60% can be diminished owing to these modifications (Tamura et al., 1998). According to Abdelrazaq et al. (2014), Incheon Tower (South Korea, vision) has slotted corners, which provides a 60% reduction in the wind-induced base moment.

A recessed/notched or cut corner, which reduces the width of the building by 10% compared with a sharp corner, reduces the along-wind building response by 40% and the across-wind building response by 30% (Holmes, 2001). In Cayan Tower (Dubai, 2013), corners are also designated as notched to contribute to buildings performance against the wind forces (Baker et al., 2010).

Irwin (2009) termed “modified corners” as “softened corners” and states that “The corner softening should extend about 10% of the building width in from the corner.” Additionally, according to Irwin et al. (2008a), for the best mitigation effect of corner modifications, the optimum modification length is about 10% of the building width.

The utilization of rounded corners is the most effective strategy among corner modifications (Gu and Quan, 2004). Approaching a circular form in the plan by increasing the corner roundness also diminishes the wind loads affecting the building to an important degree (Miyashita et al., 1995; Kareem et al., 1999; Gu and Quan, 2004). When comparing saw-tooth corners that are a development of recessed corners, with sharp corners, in the view of Poon et al. (2004) they could remarkably reduce the wind load affecting the building. For example, according to Irwin (2008, 2009), saw-tooth corners provide nearly a 25% reduction in the wind-induced base moment in TAIPEI 101 (Taipei, 2004) (Figure 12a). Supertall building examples include the use of;

- saw-tooth (double-notch) corners in the Two International Finance Centre (Hong Kong, 2003) (Figure 12b),
- cut corners in One World Trade Center (New York, 2014) (Figure 12c) (Lewis and Holt, 2011).

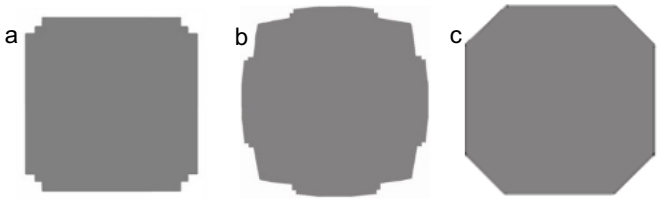


Figure 12. Examples of corner modifications (a) TAIPEI 101, saw-tooth corners; (b) Two International Finance Centre, saw-tooth corners; (c) One World Trade Center, cut corners

The results of preliminary wind tunnel testing for the International Commerce Center (ICC) (Hong Kong, 2010) (Figure 13) indicated that a square with notches had similar beneficial properties as a circular tower (Malott, 2010; Malott and KPF Ass., 2014; Tang, 2016).

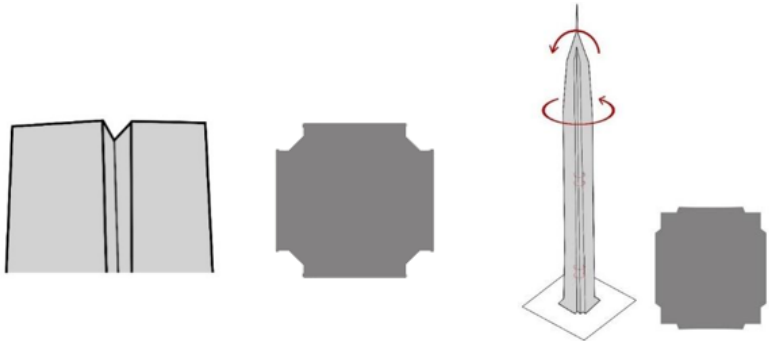


Figure 13. Corner modification of ICC Figure 14. Corner modification of PAFC

Ping An Finance Center (PAFC) (Shenzhen, 2017) features tapering corners, which are enormously effective in the reduction of wind loading (Figure 14). Owing to its form, PAFC achieves a 32% reduction in the overturning moment and a 35% reduction in wind load according to the Chinese code (Malott and KPF Ass., 2014).

Air passes

Air passes in the building would allow the air to bleed into the wake and separated regions so increase the base pressure and so decrease aerodynamic forces (Amin and Ahuja, 2010). In 432 Park Avenue (New York, 2015) (Figure 15a) two-story open floors, namely air passes, cause a reduction in wind loads on the building by minimization of vortex forces (Durst et al., 2015; Macklowe, 2015; Marcus, 2015). Similarly, in Aspire Tower (Doha, 2006) (Figure 15b), some part of the surface of the facade on the building is in the form of a permeable mesh and some part being in the form of solid cladding. Employing the wind permeable part of the facade, the across-wind effect on the building is reduced (Chikaher and Hirst, 2007). As another spectacular example, Greenland Group Suzhou Center

(Wujiang, under construction) (Figure 15c), called as 'breathing tower', has aerodynamically favorable air passes (Wimer et al., 2012).

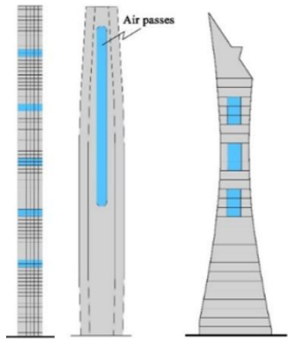


Figure 15. Air passes (a) 432 Park Avenue, New York, 2015; (b) Aspire Tower, Doha, 2006; (c) Greenland Group Suzhou Center, Wujiang, under construction

CONCLUSION

As a result of becoming increasingly taller, high slenderness ratio, low natural frequency, inherent damping levels, and high wind velocity at upper levels, new generations of supertall buildings have been more sensitive to wind loads. Since the outer shape of the building is one of the key design parameters that affect the wind load, today's supertall buildings have been predominantly shaped by considering major and minor aerodynamic modifications. Regarding the effect of the wind on supertall buildings, the trend of "aerodynamically adaptive architectural form" is worth stating to endorse. In this trend, during the generation of architectural form in the preliminary design stage, some major modifications that affect the overall building form like "aerodynamic form" and "plan variation", must be taken into account as a significant design input. It should be remembered that considerations regarding aerodynamic optimization of building forms in the early architectural design phase are proved to be the most effective way to achieve the wind-resistant design. At the end of the iterative processes through the design stages supported by wind tunnel tests in most cases, an ideal form is figured out in terms of the integration between architectural and aerodynamic forms. In this context, the collaboration between the architect and the wind engineer has been gaining importance inevitably. From this standpoint, it is sensible to believe that the architectural trend for the next generation of supertall buildings seems to create an overall architectural form integrated with aerodynamic concerns, namely aerodynamically adaptive architectural forms.

REFERENCES

Abdelrazaq, A., Jeong, M., Soo, G.L., Sangki, J. (2014) Optimizing the Structural Design of the 151 Story Incheon Tower, CTBUH 2014 Shanghai Conference Proceedings.

Ahci, A. and Sarkisian M. (2011) Al Hamra Firdous Tower, CTBUH 2011 Seoul Conference.

Alaghmandan, M., Bahrami, P., Elnimeiri, M. (2014) The Future Trend of Architectural Form and Structural System in High-Rise Buildings, Architecture Research, 4(3), pp. 55-62.

Alaghmandan, M., Abdolhossein-Pour, F., Mohammadi, J. (2013) Innovative Design Method of Tall Buildings, Cutting Edge: 47th International Conference of the Architectural Science Association, pp. 525-534.

Al-Kodmany, K. and Ali, M.M. (2016) An Overview of Structural and Aesthetic Developments in Tall Buildings Using Exterior Bracing and Diagrid Systems, International Journal of High-rise Buildings, Vol.5, No.4, pp.271-291, December.

Ali, M.M. and Armstrong, P.J. (1995) Architecture of Tall Buildings, Council on Tall Buildings and Urban Habitat Committee 30, McGraw-Hill, Inc., New York.

Amin, J.A. and Ahuja, A.K. (2010) Aerodynamic Modifications to the Shape of the Buildings: A Review of the State-of-the-Art, Asian Journal of Civil Engineering (Building and Housing) Vol. 11, No. 4.

Baker, W., Brown, C., Young, B., Zachrison, E. (2010) Infinity Tower, Dubai, UAE, Structures Congress 2010: pp. 3078-3087.

Baker, W., James, P., Tomlinson, R., Weiss, A. (2009) Case Study: Trump International Hotel and Tower, CTBUH Journal, Issue III.

Chikaher, G. and Hirst, J. (2007) Aspire Tower, Doha, Qatar, The Arup Journal 2, pp. 3-13.

Cooper, K.R, Nakayama, M., Sasaki, Y., Fediw, A.A., Resende-Ide, S., Zan, S.J. (1997) Unsteady Aerodynamic Force Measurements on A Super-Tall Building with A Tapered Cross Section, Journal of Wind Engineering and Industrial Aerodynamics, 72.

CTBUH, Council on Tall Buildings and Urban Habitat, Illinois Institute of Technology, S.R. Crown Hall, 3360 South State Street, Chicago, Illinois, USA, www.ctbuh.org.

Daraphet, M. (2013) Tall Building: Imaginative Facade Solutions, CTBUH Journal.

Davenport, A. (1971) The Response of Six Building Shapes to Turbulent Wind, Philosophical Transactions of the Royal Society of London, 269, pp. 385-394.

Dutton, R. and Isyumov, N. (1990) Reduction of Tall Building Motion by Aerodynamic Treatments, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 36.

Durst, A., Safdie, M., Ingels, M., Gilmartin, M., Malkin, A., Marcus, S., Adlerstein, M., Rudin, M., Cotter, R., Shepherd, L., Libeskind, D. (2015) Perspectives on the Skyscrapers City, CTBUH Journals, Issue IV.

Elshaer, A., Bitsuamlak, G., Damatty, A. (2017) Enhancing Wind Performance of Tall Buildings Using Corner Aerodynamic Optimization, Engineering Structures, Vol. 136, pp. 133-148.

Gu, M. and Quan, Y. (2004) Across-wind Loads of Typical Tall Buildings, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 92, pp. 1147-1165.

Gunel, M.H. and Ilgın, H.E. (2014a) Tall Buildings: Structural Systems and Aerodynamic Forms, London and New York: Routledge.

Gunel, M.H. and Ilgın, H.E. (2014b) Yüksek Binalar: Taşıyıcı Sistem ve Aerodinamik Form, METU, Publication of Faculty of Architecture, Ankara, December. (ISBN: 978-975-429-278-7) (2nd edition)

Hansora, A.G., Nimodiya, P.N., Gehlot, K. P. (2015) Numerical Analysis of Wind loads on Tapered Shape Tall Buildings, IJSTE - International Journal of Science Technology & Engineering, Vol. 1, Issue 11, May.

Henn, M. (2016) The Haikou Tower - Signifier and Signified, Cities to Megacities: Shaping Dense Vertical Urbanism, CTBUH 2016 Conference.

Ho, P.H.K. (2007) Economics Planning of Super Tall Buildings in Asia Pacific Cities, Strategic Integration of Surveying Services FIG Working Week 2007, Hong Kong, China, 13-17 May.

Holmes, J.D. (2001) Wind Loading of Structures, Spon Press, London.

Igın, H.E. (2006) A Study on Tall Buildings and Aerodynamic Modifications Against Wind Excitation. MSc Thesis, Department of Architecture, Middle East Technical University, Ankara.

Ilgın, H.E. (2018) Potentials and Limitations of Supertall Building Structural Systems: Guiding for Architects. PhD Dissertation, Department of Architecture, Middle East Technical University, Ankara.

Ilgın, H.E. (2021) Space Efficiency in Supertall Office Buildings, Journal of Architectural Engineering, Vol. 27, Issue 3.

Ilgın, H. and Gunel, M. (2007) The Role of Aerodynamic Modification in the Form of Tall Building Against Wind Excitation, METU JFA, p. 17-25.

Ilgın, H.E., Ay, B.O., Gunel, M.H. (2021) A Study on Main Architectural and Structural Design Considerations of Contemporary Supertall Buildings, Architectural Science Review, Vol. 64, Issue 3, p. 212-224.

Irwin, P.A. (2008) Bluff Body Aerodynamics in Wind Engineering, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 96, p. 701-712.

Irwin, P.A. (2009) Wind Engineering Challenges of the New Generation of Super-tall Buildings, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 97, pp. 328-334.

Irwin, P.A. and Baker, W.F. (2006) The Burj Dubai Tower: Wind Engineering, Structure Magazine, pp. 28-31, June.

Irwin, P.A., Baker, W.F., Korista, S., Weismantle, P.A., Novak, L.C. (2006) The Burj Dubai Tower: Wind Tunnel Testing of Cladding and Pedestrian Level, Structure Magazine, pp. 48-51, November.

Irwin, P.A., Kilpatrick, J., Frisque A. (2008a) Friend or Foe, Wind at Height, CTBUH 8th World Congress 2008, Dubai.

Irwin, P.A., Kilpatrick, J., Robinson, J., Frisque, A. (2008b) Wind and Tall Buildings: Negatives and Positives, The Structural Design of Tall and Special Buildings, Vol. 17, pp. 915-928.

Isyumov, N., Fediw, A., Colaco, J., Banavalkar, P.V. (1992) Performance of a Tall Building Under Wind Excitation, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 41-44.

Kareem, A., Kijewski, T., Tamura, Y. (1999) Mitigation of Motion of Tall Buildings with Specific Examples of Recent Applications, Wind and Structures, Vol. 2, No. 3, p. 201-251.

Kawai, H. (1998) Effect of Corner Modifications on Aeroelastic Instabilities of Tall Buildings, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 74-76, pp. 719-729.

Kelly, D., Poon, D., Irwin, P., Xie, J. (2012) Wind Engineering of the Shanghai Center Tower, Advances in Hurricane Engineering: American Society of Civil Engineers, pp. 426-436.

Khan, F.R. (1972) The Future of High-Rise Structures, Progressive Architecture.

Kikitsu, H. and Okada, H. (2003) Characteristics of Aerodynamic Response of High-rise Buildings with Open Passage, Proceedings of the CIB-CTBUH International Conference on Tall Buildings, Malaysia.

Kim, Y.C. and Kanda, J. (2008) Wind Response Characteristics for Habitability of Tall Buildings in Japan, Structural Design of Tall Special Buildings, 17, pp. 683-718.

Kim, Y. and You, K. (2002) Dynamic Responses of a Tapered Tall Building to Wind Loads, Journal of Wind Engineering and Industrial Aerodynamics.

Kim, Y., You, K., Ko, N. (2008) Across-wind Response of an Aeroelastic Tapered Tall Buildings, Journal of Wind Engineering and Industrial Aerodynamics, Vol. 96, pp. 1307-1319.

Kumar, K.S., Irwin, P.A., Davies, A. (2006) Design of Tall Building for Wind: Wind Tunnel vs. Codes/Standards, 3rd National Conference on Wind Engineering, Calcutta, India, pp. 318-325.

Kwok, K.C.S. (1995) Aerodynamics of Tall Buildings, A State of The Art in Wind Engineering: International Association for Wind Engineering, 9th International Conference on Wind Engineering, New Delhi, India.

Kwok, M. and Lee, A. (2016) Engineering of Guangzhou International Finance Center, International Journal of High-rise Buildings, Vol 5, No:4, pp. 49-72.

Lee, B.E. (1990) Some Observation of The Aspect Ratio on The Influence of Turbulence on The Drag of Rectangular Cylinder, Journal of Wind Engineering and Industrial Aerodynamics 33, pp. 107-111.

Lee, B., Baker, W., Johnson, R., Rhee, I. (2016) Next-Generation Supertall Tower Form Determinants: A Study of the Tianjin CTF Finance Center, CTBUH Proceeding.

Lewis, K. and Holt, N. (2011) Case Study: One World Trade Center, CTBUH Journal, Issue III.

Macklowe, H. (2015) The Complex Path to Simple Elegance: The Story of 432 Park Avenue, CTBUH Journal.

Macmillan, A. and Metzstein, I. (1974) Amenity and Aesthetic of Tall Buildings, in Tall Buildings and People?, Proceedings of Conference, Great Britain, September 17-19, Institution of Structural Engineers, London, England, pp. 91-96.

Malott, D. (2010) Case Study: Hong Kong International Commerce Center, CTBUH Journal, Issue IV.

Malott, D. (2014) Kohn Pedersen Fox Associates, Designing Chine's Tallest: DNA of the Ping An Finance Center, CTBUH Journal.

Marcus, S. (2015) The New Supers: The Super-slender Towers of New York, CTBUH Journal.

Melbourne, N.H. (1989) Wind Loading and Environment of Tall Building, International Conference on Tall Buildings and City Development, Brisbane.

Melbourne, N.H. and Cheung, J.C.K. (1988) Designing for Serviceable Accelerations in Tall Buildings, 4th International Conference on Tall Buildings, Hong Kong and Shanghai.

Miyashita, K., Nakamura, O., Tagaya, K., Abiru, H. (1995) Wind Tunnel Tests and Full-Scale Measurements of High-Rise Building Equipped with TAD, Proceedings of the 5th East Asia-Pacific Conference on Structural Engineering and Construction, pp. 1262-1266.

Moon, K.S. (2011) Diagrid Structures Complex-Shaped Tall Buildings, The 12th East Asia-Pacific Conference on Structural Engineering and Construction, Procedia Engineering 14, pp. 1343-1350.

Moon, K.S. (2015a) Structural Design and Construction of Complex-Shaped Tall Buildings, IACSIT International Journal of Engineering and Technology, Vol. 7, No. 1, pp. 30-35.

Moon, K.S. (2015b) Supertall Asia/Middle East: Technological Responses and Contextual Impacts, Buildings, 5, pp. 814-833.

Mooneghi, M.A., Kargarmoakhar, R. (2016) Aerodynamic Mitigation and Shape Optimization of Buildings: Review, Journal of Building Engineering, 6, pp. 225-235.

Nakamura, Y. (1993) Bluff-Body Aerodynamics and Turbulence, Journal of Wind Engineering and Industrial Aerodynamics, 49, pp. 65-78.

Nordenson, G. and Riley, T. (2003) Tall buildings, New York, London: Museum of Modern Art and Thames & Hudson.

Park, S.M. (2005) Tall Building Form Generation by Parametric Design Process, PhD Dissertation, College of Architecture, Illinois Institute of Technology, Chicago.

Poon, D.C.K., Shieh, S., Joseph, M.L., Chang, C. (2004) Structural Design of Taipei 101: The World's Tallest Building, CTBUH Seoul Conference, pp. 271-278, Seoul.

Schueller, W. (1977) High-Rise Building Structures, John and Wiley Sons Inc., New York.

Scott, D., Hamilton, N. Ko, E. (2005) Structural Design Challenges for Tall Buildings, Structure Magazine, Vol. 2, pp. 20-23, February.

Sharma, A., Mittala, H., Gairolab, A. (2018) Mitigation of Wind Load on Tall Buildings Through Aerodynamic Modifications: Review, Journal of Building Engineering, 18, pp. 180-194.

Soto, R. and Al-Shihabi, B. (2015) Iconic Office Tower Propels Saudi Arabia into the New Global Century, Challenges, and Innovations, CTBUH Conference Proceeding.

Tamura, T., Miyagi, T., Kitagishi, T. (1998) Numerical Prediction of Unsteady Pressures on a Square Cylinder with Various Corner Shapes, Journal of Wind Engineering and Industrial Aerodynamics, 74-76, pp. 531-542.

Tanaka, H., Tamura, Y., Ohtake, K., Nakai, M., Kim, Y., Bandi, K.E. (2013) Aerodynamic and Flow Characteristics of Tall Buildings with Various Unconventional Configurations, International Journal of High-Rise Buildings, Vol. 2, No. 3.

Tang, T. (2016) ICC- The Rising High for the Future of Hong Kong, CTBUH Journal.

Taranath, B. (2005) Wind and Earthquake Resistant Buildings: Structural Analysis and Design, A Series of Reference Books and Textbooks (Editor: Michael D. Meyer), Department of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia.

Tomlinson II, R., Baker, W., Leung, L., Chien, S., Zhu, Y. (2014) Case Study: Pearl River Tower, Guangzhou, CTBUH Journal 2014 Issue II.

Tse, K.T. (2009) Hitchcock, P.A, Kwok, K.C.S, Thepmongkorn, S., Chan, C.M. Economic Perspectives of Aerodynamic Treatments of Square Tall Buildings, Journal of Wind Engineering and Industrial Aerodynamics, No. 3, 43.

Viise, J., Zhao, Y., Halvorson, R. (2012) Development of Innovative Structure for Supertall and Unique Towers, CTBUH 9th World Congress Shanghai.

Vollers, K. (2008) Morphological Scheme of Second-Generation Non-Orthogonal High-Rises, Proceedings of the 8th World Congress of the Council on Tall Buildings and Urban Habitat: Tall & Green: Typology for a Sustainable Urban Future, Post Congress Review, pp. 504-512.

Xie, J. (2014) Aerodynamic Optimization of Super-Tall Buildings and Its Effectiveness Assessment, Journal of Wind Engineering Industrial Aerodynamics, 130, pp. 88-98.

Xie, F. and Ai, X. (2016) Coupling of Urban Value & Mega High Rise: Ping An Finance Center, CTBUH Conference Proceeding.

Weismantle, P.A., Stochetti, A. (2013) Kingdom Tower, Jeddah, CTBUH Journal, Issue I.

Weismantle, P.A., Smith, G.L., Sheriff, M. (2007) Burj Dubai: An Architectural Technical Design Case Study, Struct. Design Tall Spec. Build. 16, pp. 335-360.

Wilkinson, C. (2012) Guangzhou Finance Center: An Elegant Simplicity of Form, CTBUH Journal.

Wilkinson, C. (2016) Exploring Geometry and Form in Tall Building, CTBUH Journal.

Wimer, R., Baker, W., Nagis, M., Mazeika, A. (2012) Case Study: Greenland's Suzhou Center, Wujiang, CTBUH Journal, Issue III.

A STATISTICAL STUDY ON MULTI-STORY TIMBER RESIDENTIAL BUILDINGS (1995-2020) IN FINLAND

Markku KARJALAINEN[1], Hüseyin Emre ILGIN[2]

[1]*Tampere University, Finland*
markku.karjalainen@tuni.fi
[2] *Tampere University, Finland*
emre.ilgin@tuni.fi

ABSTRACT

This study investigated the structural frame design of the multi-story timber residential apartment buildings constructed between 1995-2020 in Finland as well as the form of ownership of the apartments in each building. The results indicate that: the frame designs used in Finnish multi-story timber apartment buildings were platform-frames (50%), volumetric modular element designs based on CLT technology (35%), veneer pillar-beam-ribbed slab frames (7%), and CLT or LVL based slab elements (7%). Based on the findings, CLT and LVL modular elements were becoming the most common technology for new multi-story timber residential buildings in Finland. On the other hand, the Finnish fire code has allowed freer use of wood as the visible facing material of indoor surfaces since the beginning of 2018. This appeared to favor CLT designs, where massive wood surfaces can be left visible on indoor surfaces. Timber-concrete composite slab structures were most used in the intermediate floors due to their good sound insulation. The timber residential buildings constructed in Finland consist of rental (57%), privately owned (33%), right-of-residence (9%), and semi-privately owned (1%) apartments.

Key Words: Timber Construction; Multi-Story Residential Building; Modular Element; CLT; LVL.

INTRODUCTION

In the Finnish economy, the forest industry has represented one of the leading sectors, where the value of forest industry production in 2018 was over 23 billion euros and the forest sector accounts for about 20 percent of Finland's export revenue. (Forests and the economy, 2020). That means that the quantity of roundwood on land available for wood production has been increased by more than 20 million cubic meters compared to the previous year (Luke, 2018) e.g., as a source of bioenergy and in construction, the wood product industry, and a variety of processed bioproducts.

About four-fifths of Finland's sawn timber is used in construction (Karjalainen, 2017a), where residential construction plays a significant role. At the end of 2019, there were about 1,5 million buildings in Finland (excluding free-time residences and agricultural buildings), where residential buildings constituted nearly 62% of the total gross floor area (Building stock, 2019). Residential buildings, energy renovations of suburban residential building façades, construction of additional floors together with infill construction are the largest growth potential in Finland's timber construction (ATUT, 2018).

Wood is an ecological and environmentally friendly renewable material (Ilgın and Karjalainen, 2021; Ilgın et al., 2021; Karjalainen et al., 2021a; Tulonen et al. 2021). While growing, one cubic meter of wood can bind about one ton of CO_2 from the atmosphere, the mass of wood is about 500 kg/m^3, about half of which mass is carbon=250 kg/m^3 (Tolppanen et al., 2013; Aaltonen, 2019). Growing forests are carbon sinks and timber/wood products are natural carbon stores. Therefore, wood in construction as the hero in combatting global warming should be increasingly promoted globally.

Moreover, and the forest sector accounts for over half of the value of the Finnish bioeconomy. To meet the strategic priorities in the Finnish Government Programme regarding bio-economy and clean solutions considering circular economy (Government key projects, 2020), the construction sector plays an important role. Finland's Ministry of the Environment has long been preparing a roadmap for reducing greenhouse gas emissions from the manufacture of construction materials and products. The aim is for the carbon footprint of buildings, as well as the carbon footprint, to be taken into account in building regulations by the mid-2020s.

As a domestic, local, renewable, and environmentally friendly energy source and building material, wood will be an increasingly popular raw material in this respect. Thus, a more environmentally sensitive approach to construction is also parallel to the Finnish governmental bio-economy strategy that timber construction should be promoted throughout Finland, and European climate policy and must be presented as a response to the demand for Finnish sustainable building construction (Bosman and Rotmans, 2016; Karjalainen, 2017a; Karjalainen, 2017b; Wood Building Programme, 2021).

As an engineered wood product, CLT (cross-laminated timber, a prefabricated multi-layer EWP, manufactured from at least three layers of boards by gluing their surfaces together with an adhesive under pressure) has been available in Europe since its invention in the early 1990s mainly in Germany and Austria in small-scale projects (Espinoza et al., 2015). However, today CLT - also LVL (Laminated Veneer Lumber), made by bonding together thin vertical softwood veneers with their grain parallel to the longitudinal axis of the section, under heat and pressure) - has gradually become a favorable structural material for tall timber building construction thanks to its high resistance, rigidity, and versatile applicability (Schickhofer, et al., 2016; Vatanen; 2017; Karjalainen, 2017a; Ilgın et al., 2021).

Empirically, Finland is an interesting case as timber multi-story construction has been high on the national policy agenda since the 1990s, and there are high expectations on the future market growth (Vihermäki et al., 2020; Karjalainen et al., 2021b). After three pilot timber residential buildings, the Finland fire code was revised to allow residential and office buildings with timber structures and façade up to 4-story high, and then up to 8-story high in 1997 and 2011, respectively, and finally, owing to the revision in 2018, it became possible to design and construct residential and office buildings as well as lodging and institutional buildings with wood structure and façade up to 8-story high (The National Building Code of Finland - Structural Fire Safety, 2017). It is also possible to build timber residential buildings with over 8-story height according to functional fire design analysis in Finland.

After Spain, Finland has the second-highest proportion of multi-story buildings in Europe and nearly 46% of Finnish housing units are situated in multi-story buildings (Karjalainen, 2019). Still, today, of all new housing units annually built nearly 30,000-40,000 units, but the market share of timber multi-story apartments constructed in Finland was only 1% in 2010, while the share had risen to 10% by 2015 (Toppinen et al., 2018).

Between 2016 and 2020, the number of new homes increased to approximately 35,000 to 45,000 dwellings, with the share of apartments being the largest (25,000 to 35,000 dwellings). More than 70% of new dwellings per year are still being built in apartments. Concrete has dominated the apartment market for the past sixty years. Today, in 2019, the market share of timber multi-story buildings in residential buildings is about 6-7% in Finland, if the 2-story high block of flats is also taken into considerations. 103 over-two-story timber residential buildings comprising 3052 apartments were constructed in Finland as of January 2021.

At the same time, the share of detached houses has dropped significantly from the 2006 record. In recent years, only a fifth of new housing production is detached houses, i.e. detached houses and semi-detached houses. More than eight out of ten small houses receive a timber frame and about three-quarters a wooden façade. About a quarter of detached house builders currently choose a log home.

Timber apartment buildings are making a final breakthrough

By mid of 2021, 117 two-story timber apartment buildings have been built in Finland, a total of 3,675 apartments. According to the 11/2020 project survey of timber apartment buildings commissioned by the Ministry of the Environment, more than 2,750 new secure timber apartment buildings will be added in the next few years. In addition to the above, there are about nine thousand new residential timber apartment buildings in various parts of Finland. Timber school and kindergarten buildings are also becoming significantly more common in Finland when it is desired to strive for a healthy and comfortable indoor climate. According to Puuinfo's statistics (2021), about 500 timber kindergartens and about 300 timber schools have been built in Finland since the 2010s. (See Figure 1 - Finland's largest nursery school; Imatran Mansikkala, 11,000 m^2).

Figure 1. Finland's largest nursery school, Imatran Mansikkala (Photo: Markku Karjalainen)

Frame systems for timber apartment buildings in Finland

There are several types of structural frame systems utilized in timber residential building construction (Breyer et al., 2019). Manufacturing capacity of Finnish production plants for timber frame elements to meet the demands in the residential market. The American platform-frame system was mostly used for the construction of Finland’s earliest residential buildings, which was based on floor-by-floor stud frame construction. In this system, the frame is generally made from precut timber elements either by constructing one floor at a time on-site or by employing prefabricated small or large elements in different phases of completion.

Nowadays, large elements are most preferred in timber residential construction, where laminated timber is also utilized in stud frames. Moreover, different types of mixed-frame systems are possible to use. Typically, the structural systems used in all timber residential buildings have

relatively short spans between 4.5-8 meters. Besides, Finnish timber-frame residential buildings usually have wooden façades, but other materials for façade designs are also possible.

In recent years, particularly Cross Laminated Timber (CLT) has turned into a widely utilized technology in Finnish residential construction (Vatanen et al., 2017). Vertical and lateral elements of the building's structural system are formed from massive timber sheets. CLT elements are made of crossed layers of boards and glued together. CLT and LVL frame-based-volumetric-modular-element technology based on has very quickly become prevalent in timber residential building construction in Finland. The use of dry, lightweight, largely prefabricated elements provides a high construction speed that reduces construction time on site and thus lowers total construction costs. Furthermore, due to the limitations of road transport, the most common modular element sizes are as follows: 4.5 (width) x 3.0 (height) x 13.5 (length) in meters. Besides, a few timber residential buildings with a pillar-beam-ribbed slab system based on LVL technology have also been constructed in Finland. The system concept is quite sophisticated, and its most competitive area is in 3-4-story timber residential and office buildings. Laminated Glulam wood is also suitable for beam-pillar frames.

The development of the CLT system was initially taken forward in Finland by StoraEnso, which in 2016 also launched its production of LVL (Laminated Veneer Lumber) solid wood panels glued from veneers in Varkaus. LVL products are also manufactured in Finland by Metsä Wood. Domestic CLT production began at the CrossLam plant in Kuhmo in December 2014. Since then, the Finnish CLT board has also entered factory production in Alajärvi (Hoisko CLT) and Kauhajoki (CLT-Plant). In co-operation with Suomen Puukerrostalot Oy, the Swedish Lindsbäck Bygg has also entered the Finnish volumetric prefabricated construction market.

Resident survey of timber apartment buildings in Finland

At the end of the 1990s, Karjalainen (2002) conducted a comprehensive resident survey in Finland's first more than 2-story timber apartment buildings. At that time, 7 timber apartment buildings were included in the resident survey: a total of 20 houses, 242 apartments. Responses were received from 197 dwellings, which resulted in a relatively high response rate (= 81.4%). In this resident survey, residents were positive about timber apartment buildings, and it was hoped that wood construction and the use of wood would be increased in Finland.

In 2017, the Ministry of the Environment commissioned a new extensive survey of residents and builders of timber apartment buildings from the Department of Architecture of the Tampere University, which included 9 newest timber apartment building projects from all over Finland: a total of 17 houses, 585 apartments, where 308 responses were received to the resident survey, resulting in a response rate of 52.6% (Karjalainen and Ilgın, 2021)

In both resident surveys, timber apartment buildings were generally considered to be cozy, comfortable, with a good indoor climate, functional, architecturally successful, fireproof, and soundproofed. Based on the resident survey, special attention should be paid to the impact sound insulation of the light intermediate bases of timber apartment buildings. Residents hope that more wood will be used than before, especially in the interior cladding of stairwells, balconies, and apartments.

The developers of all the sites thought the sites were very successful and the feedback during their use was positive. The developers wanted to continue building new wooden apartments. In the residential construction sector, it is expected that there will be competition between different building materials, different construction methods, and different actors in the wood industry, development work will be continuous and there will be different options for residential developers and residents as well as the power construction method.

National wood construction programs

Finland's Ministry of Employment and the Economy carried out the National Timber Construction Program alongside the Forestry Strategic Program (MSO) from 1 January 2012 to 30 September 2015. The purpose of the wood construction program was to reduce the carbon footprint of construction by significantly increasing the use of domestic wood in construction. A new wood construction program was launched at the Ministry of the Environment for the period from 1 August 2016 to 31 December 2018. The program has since been extended until the end of 2022.

In the scope of the programs, new wooden construction sites are always mapped in collaboration with the country's most important developers, construction companies and municipal decision-makers, and development bodies in growth centers. The targets have been larger assets than individual buildings where wood is used naturally and competitively.

The Finnish government also plans to promote timber construction in terms of regional economy and employment. By increasing wood construction, it is possible to increase the demand and export opportunities for wood products and at the same time create new jobs in Finland.

Timber construction training and collaboration

Training in timber construction has had to be updated at all levels in Finland to meet the demand for large-scale industrial timber construction, where the use of timber in architecture attracts more attention of architects. This is evidenced by many new timber-framed apartment buildings, residential areas, schools and kindergartens, music buildings, church and chapel buildings, and sports halls. Structural designers have something to learn with Eurocodes, CE markings, and ever-changing energy regulations.

Therefore, designers need easy and logical guides, design tools, and programs to support their design.

There has been a nationwide need to sharpen, unify and make more effective wood construction projects, research and development activities by increasing cooperation and communication between actors in the field. Rigorous competition is a fundamental prerequisite for the growth and internationalization of the wood products industry. There have also been improvements in wood companies' manufacturing, product development, network, and market expertise.

Tampere University has attempted to meet the challenges of developing, researching, and teaching industrial wood construction in Finland. In co-operation with TAU's RAK and ARK units, for example, Graduate School of Industrial Wood Construction (2021 - 2026), Wood Competence for Pirkanmaa - ESF-funded in-service training project (2021 - 2022), and tPUUr - Electronic learning material for industrial wood construction - 20. (See Figure 2 -Timber apartment building site Kuusikko, summer 2021, Tampere).

Figure 2. Timber apartment building site, Tampere (Photo: Eveliina Oinas)

CONCLUSION

Timber construction plays a critical role in supporting the bioeconomy and promoting the use of wood can help support the sustainable and judicious management of forests. Increasing the amount of timber used in construction is also an effective way to meet the energy and climate targets set out in the National Energy and Climate Strategy and reduce Finland's carbon footprint by 2030.

In this study, the structural frame design of multi-story timber residential apartments built between 1995 and 2020 in Finland and the ownership form of the apartments in each building were examined. Platform-frames and volumetric modular element designs based on CLT were frequently utilized in multi-story timber apartment buildings in Finland. Timber-concrete composite board structures are mostly used on the intermediate floors owing to their superiority in sound insulation. Timber residential apartment buildings built in Finland mostly consist of rental and privately owned properties.

ACKNOWLEDGEMENTS

The authors wish to thank the School of Architecture (Tampere University), Finland's Ministry of the Environment, Finnish Timber Council, and Council of Tampere Region for the support of the study "Competitiveness of Multi-story Timber Apartment Buildings", which comprised the basis for this paper.

APPENDIX - SUMMARY OF TIMBER APARTMENT BUILDING SITES

1. YLÖJÄRVI (1996); 19 apartments, 3 houses, 2 – 3 floor, 1,465 k-m²
2. HELSINKI, VIKING MANSIO (1997); 65 apartments, 7 houses, 2 – 4 floor, 5,833 k-m²
3. OULU, PUUKOTKA (1997); 33 apartments, 3 houses, 3 floor, 2,190 k-m²
4. TUUSULA, HYRYLÄ (1997); 46 apartments, 2 houses, 4 floor, 3,622 k-m²
5. RAISIO (1997); 42 apartments, 3 houses, 4 floor, 2,550 k-m²
6. PORVOO, FREDRIKA (1998); 19 apartments, 1 house, 2 – 3 floor, 1,371 k-m²
7. PORVOO, ALEKSANTERINKATU (1999); 24 apartments, 1 house, 4 floor, 2,498 k-m²
8. NAANTALI (2000); 51 apartments, 3 houses, 4 floor, 4,080 k-m²
9. OULU, PUU-LINNANMAA (2002); 14 apartments, 1 house, 3 floor, 994 k-m²
10. LAHTI, PUU-PAAVOLA (1998 –2003); 74 apartments, 4 houses, 4 floor, 7,300 k-m²
11. HELSINKI, OMENAMÄKI (2006); 131 apartments, 3 houses, 3 – 4 floor, 12,165 k-m²
12. HEINOLA, PUUMERA (2011); 27 apartments, 1 house, 5 floor, 1,915 k-m²
13. HELSINKI, VIIKIN LATOKARTANO (2012); 104apartments , 5houses ,3 – 4 floor, 6,300 k-m²
14. SEINÄJOKI, BIRD CLOTH 2 (2013); 50 apartments, 1 house, 6 floor, 3,100 k-m^2

15. TURKU, KOY TURKU SERVICE HOME (2014); 54 apartments, 1 house, 4 floor, 3,000 k-m²
16. JYVÄSKYLÄ, PUUKUOKKA 1 (2014); 58 apartments, 1 house, 8 floor, 4,155 k-m²
17. SAARIJÄRVI, SELF-SERVICE (2015); 24 apartments, 1 house, 4 floor, 1,905 k-m²
18. HELSINKI, PUKINMÄKI (2015); 93 apartments, 4 houses, 5 – 7 floor, 7,700 k-m²
19. II, KIRJALA (2015); 15 apartments, 1 house, 4 floor, 1,200 k-m²
20. VANTAA, KIVISTÖ, PUUMERA (2015); 186 apartments, 1 house, 7 floor, 11,800 k-m²
21. SEINÄJOKI, MÄIHÄ (2016); 28 apartments, 1 house,5 floor, 1,837 k-m²
22. IMATRA (2016); 13 apartments, 1 house, 3 floor, 964 k-m²
23. KAJAANI, RAJAMIEHENTIE (2016); 15 apartments, 1 house, 3 – 4 floor, 1,200 k-m²
24. ÄHTÄRI, NAAVA CHALET (2016); 16 apartments, 1 house, 4 floor, 1,181 k-m²
25. HELSINKI, HONKASUO (2016 and 2017); 110 apartments, 4 houses,3 – 4 floor, 7,176 k-m²
26. TAMPERE, VUOREKSEN KOUKKURANTA (2017); 53 apartments, 2 houses,4 floor, 3,200 k-m²
27. JOENSUU, PIHAPETÄJÄ (2017); 40 apartments, 1 house,6 floor, 2,100 k-m²
28. HELSINKI, HONKASUO, SIKLA (2017); 43 apartments, 4 houses, 3 floor, 3,200 k-m²
29. JYVÄSKYLÄ, PUUKUOKKA 2 (2017); 70 apartments, 1 house, 7 floor, 3,673 k-m²
30. HELSINKI, KING'STAMMI (2018); 58 apartments, 2 houses, 4 floor, 3,115 k-m²
31. JYVÄSKYLÄ, PUUKUOKKA 3 (2018); 58 apartments, 1 house, 6 floor, 3,256 k-m²
32. PORI, JUDGE CORNER (2018); 23 apartments, 1 house, 3 floor, 1,460 k-m²
33. JÄRVENPÄÄ, PUUSINFONIA (2018); 27 apartments, 1 house, 3 floor, 1,158 k-m²
34. AS OY TURUN PUULINNA (2018); 94 apartments, 2 houses, 3 – 4 floor, 6,200 k-m²
35. ADMIRAL OF AS OY TURKU (2018); 30 apartments, 2 houses, 2 – 3 floor, 1,074 k-m²
36. SEINÄJOKI, TUOHI (2018); 44 apartments, 1 house, 6 floor, 2,541 k-m²
37. JYVÄSKYLÄ, SEMINAARINMÄKI (2018); 103 apartments, 2 houses, 4 floor, 4,167 k-m²
38. AS OY TURKU ADMIRAL 1 (2019); 37 apartments, 2 houses, 2 – 3 floor, 2,120 k-m²

39. HELSINKI, JÄTKÄSAARI, WOOD CITY (2019); 98 apartments, 2houses a, 8 floor, 8,200 k-m^2
40. TURKU, KOY GOLIATHIN SALMI (2019); 31 apartments, 2 houses, 4 floor, 2,665 k-m^2
41. TURKU, YH PRIIMUS (2019); 83 apartments, 1 house, 4 floor, 4,675 k-m^2
42. TURKU, AS OY TURUN MARINUM (2019); 82 apartments, 3 houses, 2 – 3 floor, 2,852 k-m^2
43. ROVANIEMI, DAS KELO (2019); 103 apartments, 1 house, 8 floor, 4,583 k-m^2
44. JOENSUU, LIGHT HOUSE (2019); 117 apartments, 1 house, 14 floor, 5,935 k-m^2
45. NURMIJÄRVI, TOIMELA (2019); 53 apartments, 1 house, 4 floor, 3,253 k-m^2
46. AS OY TAMPEREEN TUOHI (2019); 36 apartments, 1 house, 4 floor, 1,513 k-m^2
47. AS OY TURUN LINNANFÄLT LANTERN BEARER (2019); 57 apartments, 1 house, 5 floor, 3,285 k-m^2
48. HÄMEENLINNAN VISA 1 (2019); 31 apartments, 1 house, 4 floor, 1,218 k-m^2
49. ESPOO, TAPIOLA WIND MEADOW, PART 1 (2020); 42 apartments, 1 house, 5 floor, 3,227 k-m^2
50. AS OY VANTAA VOLTTI (2020); 34 apartments, 1 house, 5 floor, 1,900 k-m^2
51. JYVÄSKYLÄ, PUUMANNI (2020); 48 apartments, 2 houses, 4 floor, 3,000 k-m^2
52. KIRKKONUMMI, TINAPUISTO (2020); 52 apartments, 2 houses, 4 floor, 2,400 k-m^2
53. NURMES, (2020); 19 apartments, 1 house, 3 floor, 1,104 k-m^2
54. TAMPERE, HERVANTA, DOCTOR OF SCIENCE STREET (2020); 64 apartments, 1 house, 5 floor, 3,152 k-m^2
55. TURKU, LINNANFÄLTTI, KOY PÄIVÄNATE 3 + 4 (3:2020,4:2021); 128 apartments, 4 houses, 3 – 4 floor, 7,530 k-m^2
56. KIRKKONUMMI, CONSULAR TOWER (2020); 19 apartments, 1 house, 4 floor, 1,200 k-m^2
57. TURKU, LINNANFÄLTTI, AS OY PUUPYYGELI (2020); 70 apartments, 2 houses, 3 – 4 floor, 3,023 k-m^2
58. VAASA, MELANIEMI, VIHERLEHTO (2021); 32 apartments, 1 house, 6 floor, 2,495 k-m^2
59. KERAVA, AS OY KERAVA HEXAGON (BoKlok) (2021); 48 apartments, 1 house, 5 floor, 3,807 k-m^2
60. SIPOO, SÖDERKULLANRANTA (2021); 72 apartments, 2 houses, 4 floor, 3,000 k-m^2
61. ESPOO, TAPIOLA WIND MEADOW, PART 2 (2021); 165 apartments, 1 house, 13 floor, 4,787 k-m^2
62. KUOPIO, LEHTONIEMI (2021); 48 apartments, 2 houses, 4 floor, 2,680 k-m^2

63. TAMPERE, VUOREKSEN KUUSIKKO 1/6 (2021); 42 apartments, 1 house, 6 floor, 2,870 k-m^2
64. TAMPERE, KAUPPI (TOAS) (2021); 70 apartments, 1 house, 8 floor, 3,475 k-m^2
65. TAMPERE, AS OY TAMPERE HÄRMÄLÄNSYDÄN (2021); 23 apartments, 1 house, 4 floor, 1,561 k-m^2
66. JYVÄSKYLÄ, AS OY JYVÄSKYLÄN VUORIHELMI (2021); 17 apartments, 1 house, 5 floor, 1,500 k-m^2

REFERENCES

Aaltonen, J.A. (2019). Viewpoints of Residential Multi-Story Construction Industry's Productivity, Environmental Regulations and Future in Finland, MSc Thesis, Forest Economics and Marketing Faculty of Agriculture and Forestry, University of Helsinki, May.

ATUT. (2018). 10th Architectural Research Symposium. Global North – Global Challenges and Local Responses in Contemporary Architecture, Finland.

Bosman, R. and Rotmans, J. (2016). Transition Governance towards a Bioeconomy: A Comparison of Finland and The Netherlands. Sustainability. 8(10).

Breyer, D. Cobeen, K., Martin, Z. (2019). Design of Wood Structures-ASD/LRFD, Eighth Edition 8th Edition, McGraw-Hill Education.

Building stock. (2019). Official Statistics of Finland (OSF). Retrieved from https://www.stat.fi/til/rakke/2019/rakke_2019_2020-05-27_kat_002_en.html.

Espinoza, O., Trujillo, V.R., Laguarda-Mallo, M. and Buehlmann, U. (2015). Cross-Laminated Timber: Status and Research Needs in Europe, November 2015, Bioresources 11(1): pp.281-295.

Forests and the economy. (2020). Ministry of Agriculture and Forestry of Finland. Retrieved from https://mmm.fi/en/forests/forestry/sustainable-forest-management/forests-and-the-economy.

Government key projects. (2020). Ministry of Agriculture and Forestry of Finland. Retrieved from https://mmm.fi/en/keyprojects.

Ilgın, H.E. and Karjalainen, M. (2021). Perceptions, attitudes, and interest of architects in the use of engineered wood products for construction: A review, Engineered Wood Products for Construction, IntechOpen (DOI: 10.5772/intechopen.98588).

Ilgın, H.E., Karjalainen, M., Koponen, O. (2021). Review of the current state-of-the-art of dovetail massive wood elements, Engineered Wood Products for Construction, IntechOpen (DOI: 10.5772/intechopen.99090).

Karjalainen, M. (2002). The Finnish Multi-Story Timber Apartment Building as a Pioneer in the Development of Timber Construction; University of Oulu: Oulu, Finland (In Finnish).

Karjalainen, M. (2017a). Status and Possibilities of Timber Construction in Finland, Wood-based Bioeconomy Solving Global Challenges. Lilja, K. (ed.). Helsinki: Ministry of Economic Affairs and Employment of Finland, Vol. MEAE 2/2017. pp.35-39. Retrieved from https://tem.fi/documents/1410877/2937056/Status+and+possibilities+of+wood+construction+in+Finland.

Karjalainen, M. (2017b). Multistory timber apartment buildings are becoming common in forested Finland - Results of resident surveys point the way to the future of multistory timber apartment buildings. Proceedings of 5th Annual International Conference on Architecture and Civil Engineering (ACE 2017): May 8-9, 2017, Singapore. Singapore: Global Science & Technology Forum (GSTF), pp.415-417.

Karjalainen, M. (2019). Study of The Finnish Multi-Story Timber Frame Apartment Buildings 1995 - 2018, Proceeding of the 6th International Conference S. ARCH-2019 5-7 March 2019 | Havana, Cuba, 2019.

Karjalainen, M. and Ilgın, H.E. (2021). The Change over Time in Finnish Residents' Attitudes towards Multi-Story Timber Apartment Buildings, Sustainability, 13(10), 5501.

Karjalainen, M., Ilgın, H.E., Somelar, D. (2021a). Wooden Additional Floors in old Apartment Buildings: Perspectives of Housing and Real Estate Companies from Finland, Buildings, 11(8), 316.

Karjalainen, M., Ilgın, H.E., Tulonen, L. (2021b). Main Design Considerations and Prospects of Contemporary Tall Timber Apartment Buildings: Views of Key Professionals from Finland, Sustainability, 13(12), 6593.

Luke (Natural Resources Institute Finland). (2018). Retrieved from https://www.luke.fi/en/news/finnish-roundwood-harvests-a-record-high-more-than-72-million-cubic-metres.

Schickhofer, G., Brandner, R., Bauer, H. (2016). Introduction to CLT, Product Properties, Strength Classes, Conference: Cross Laminated Timber - a competitive wood product for visionary and fire safe buildings: Joint Conference of COST Actions FP1402 and FP1404, KTH, Stockholm, Sweden, March.

Puuinfo (2021). Retrieved from https://puuinfo.fi/?lang=en.

The National Building Code of Finland - Structural Fire Safety. (2017). Decree of the Ministry of the Environment of Finland, Section 8.

Tolppanen, J., Karjalainen, M., Lahtela, T., Viljakainen, M. (2013). Suomalainen puukerrostalo: rakenteet, suunnittelu ja rakentaminen. Helsinki: Opetushallitus: Puuinfo.

Toppinen, A., Röhr, A., Pätäri, S., Lähtinen, K., and Toivonena, R. (2018). The Future of Wooden Multistory Construction in The Forest Bioeconomy - A Delphi Study from Finland and Sweden, Journal of Forest Economy, Volume 31, April 2018, pp.3-10.

Tulonen, L., Karjalainen, M., Ilgın, H.E. (2021). Tall wooden residential buildings in Finland: What are the key factors for design and implementation?, Engineered Wood Products for Construction, IntechOpen (DOI: 10.5772/intechopen.98781)

Wood Building Programme. (2021). Finnish Ministry of Environment, Retrieved from https://www.ym.fi/enUS/Land_use_and_building/Programmes_and_strategies/Wood_Building_Program/Wood_Building_Programme(47800).

Vatanen, M., Sirkka, A., Pirttinen; V. & Ahoranta, T. (2017). Current state and future of CLT construction in Finland, Interview study 2016, Lapland UAS Publications, Series B. Research reports and compilations 17/2017.

Vihermäki, H., Toppinen, A., Toivonen, R. (2020). Intermediaries to Accelerate the Diffusion of Wooden Multi-storey Construction in Finland, Environmental Innovation and Societal Transitions, Volume 36, September 2020, pp.433-448.

A SEARCH FOR A NEW TALL BUILDING TYPOLOGY: STRUCTURAL HYBRIDS

Hüseyin Emre ILGIN[1]

[1]*Middle East Technical University, Turkey*
hemreilgin@gmail.com

ABSTRACT

As a contemporary trend, increasing demand for iconic towers, challenging competition for the most extraordinary skyscraper among great metropolises, and the never-ending race for constructing the tallest have begun to define the state-of-the-art of today's tall building architecture. In this uphill struggle, they have generally become a vertical monotonous duplication of a piece of land to make the ground they are erected financially as valuable as possible. However, this effort has mostly led to numerous unspectacular homogenous towers all over the world as a product of isolationist architecture. Overall, despite nearly 140 years of development, the architectural design of tall building has not reached the desired level particularly in terms of integration into the urban context and structural design. In this paper, the author proposes a classification for contemporary tall building typology in the context of hybrids. This study mainly focuses on spatial quality and structural design integration of hybrids to raise architects' consciousness of structure as an essential element of architecture. Moreover, this paper scrutinizes several representative spatial hybrid projects having the standards of spatial quality. These critical analyses are expected to aid in the rethinking and development of tall building typology with enhanced spatial quality.

Key Words: Tall Building; Building Typology; Spatial Quality; Structural Design Integration; Functional, Spatial and Structural Hybrids.

INTRODUCTION

Like the Greek temples or the Gothic cathedrals that were the foremost building types of their ages, tall buildings have become iconic structures of industrial societies. At the beginning of the 20th century, tall buildings were generally designed as offices and achieved an important position as a 'distinguished space' in the history of American urban architecture (Ilgın, 2021). These buildings emerged as a response to the rapidly growing urban population, intending to meet the demand for office units to be positioned as closely as possible to one another. Their typology has been continuously evolving from mono-function office towers at those times to 1960s simple multi-function buildings with the emergence of hybridization concept as an architectural response to the social and economic changes of the era.

In the masonry construction technique that was employed before the development of rigid frame systems, load-bearing masonry walls were used structurally. They had high levels of fire resistance; while they reduced the net usable area because of their excess dead loads and wide cross-sections (Gunel and Ilgın, 2014a). At the end of the 19th century, beginning with the discovery of the elevator and beam-column framing system with structural metal, the construction of tall buildings gained momentum as an American building type thanks to advances particularly in new structural systems, structural materials, and mechanical systems; this continues to drive the race for height in tall buildings that are spreading across the world as one of the most important symbols of today's cities (Gunel and Ilgın, 2014b).

A typical tall building could be divided into three main parts: top/head, main body/tower, base. This tripartite design approach originating in the late 19th century, best exemplified in Chrysler Building (New York, 1930) suggests that a tall building should have a distinct top (crown), middle (shaft), and base (podium) (Al-Kodmany and Ali, 2016; Ilgın, 2018; Ilgın et al., 2021). Even though the 'main body' configuration is the most critical in determining the quality of interaction between the building and environmental conditions, and in perceiving of building scale in tripartite concept (Ali and Armstrong, 1995), this part has been generally not more than a repetition of stacked floors allocated to financially desired functions.

Tall buildings have been designed with the aid of structural analysis and advanced computer technologies with outstandingly daring architectural and structural design solutions that are rarely found in their predecessors. However, contemporary tall buildings have mostly been turning into a group of progressively self-referential, inward-focused, and vertical stratified objects without cultural and/or social references to their surroundings (Koolhaas, 2008; Scheeren, 2014; Henn and Fleischmann, 2015; Safarik, 2016).

In addition to this fact, the continuation of a growing tendency to exaggerate aesthetics and style in the design of today's tall buildings sometimes could result in less and even no attention to structural integrity. This brings about not more than a repetition of the same structural configuration at floor plans, which unavoidably limits the structural design role in solving the issue rather than the synthesis with architectural design.

Because of this apparent disengagement, as a common trend for tall building design, there has been an inflexible homogeneity in the structural arrangement of each floor disregarding functional needs and user requirements through the height of the building. These above-mentioned approaches could enable a building to stand upright, however, unfortunately, they cannot solve the integration problems about the architectural potential of the structure.

This paper mainly focuses on examining the structure's space-defining and ordering roles, which throws light on areas of structures 'speaking' and even 'shouting' in their architectural contexts. Besides this leading mission, in terms of humanizing the towers, spatial hybrids having the effort of assuring their spatial quality and sustainability with representative examples, and functional hybrids at a generic level will be examined.

Thus, the architects of contemporary tall buildings must be aware of the facts above and need to analyze for the generation of alternative tall building typologies, where structure contributes architecturally, other than in its primary load-bearing role. The structure orders plans, creates spatial hierarchy, presents visual diversity and makes the space more dynamic.

HYBRIDS

Hybrids have begun to be recognized as a new architectural prototype - but not yet in all their aspects of functional, spatial, and structural potentials - in contemporary tall building typology. In this paper, taking into consideration the studies in the literature (e.g., Jacobs, 1961; Fenton, 1985; Rowley, 1996; Salingaros, 1998; Talen and Knap, 2003; Holl, 2011; Per et al., 2014; Schumacher, 2014; Ravindranath and Menon, 2018; Bagley, 2018) the following classification proposed by the author for the contemporary tall building typology for hybrids:

- Functional hybrids
- Spatial hybrids
- Structural hybrids

Functional hybrids

In the light of the researches in the literature (Fenton, 1985; Salingaros, 1998; Holl, 2011; Per et al., 2014; Ravindranath and Menon, 2018), from a functional point of view, it can be said that tall building typology has been continuously evolving from single-use mega towers of early modernism to today's multi-function hybrids as a response to the dynamic nature of social and economic changes in their era.

In this context, function is one of the most important architectural design considerations in tall building typological development. Tall buildings are mostly designed to meet the occupancy needs which are determined according to the functional requirements. As a main dominant factor that

directly affects other design factors, function is of primary concern which requires to be assessed at the early stages of the architectural design.

Generally, the functional types of tall buildings could be divided into two categories: single-use and multi-function (mixed-use). Multi-function tall buildings first appeared in the mid-1960s, and Marina City Complex (Chicago, 1964) (Figure 1) is the first multi-function tall building with the concept of 'city-within-a-city' (Kim, 2004). The 61-storey, 179m high Marina City Complex in Chicago (USA) was designed by Bertrand Goldberg & Associates. It is a reinforced concrete residential complex with a shear walled frame system.

Figure 1. Marina City Complex, Chicago, 1964 (source: Wikipedia, attribution: Diego Delso)

As the first planned development project in Chicago, Goldberg's Marina City Complex with visually striking corncob form was the tallest residential in 1964. Unlike any project before, it was a unique combination of residential, commercial, and recreational into the concept of 'city-within-a-city'. Since each floor has a different type of residential unit, no two similar floors are repetitively stacked on one another. On the other hand, it seems that there is no effort to generate the public spaces allowing social interaction and shared activities on typical floors, which gives the building potential to space articulation as in the case of spatial hybrids.

While office, hotel, residential are considered major functions; commercial/retail, parking, and observatory are considered as supplementary functions in tall building design. Multi-function tall buildings can be classified into several types according to their complexity: office with hotel; office with residential; office, hotel and residential (Kim and Elnimeiri, 2004). The combination of these functions usually requires a complex building core and circulation (Park, 2005).

Today, as the third type, functional hybrids come forefront of contemporary tall building typology. These hybrids could be designed in either single-use or multi-function with minor volumetric articulations but without caring for spatial quality within the context of architectural diversity.

To create desired spatial quality, as a further step in the development of tall building typology, spatial hybrids have begun to take place in the design scene as defined in the next section.

Spatial hybrids

Spatial hybrids can be described as tall buildings with either single-use or multi-function offer an alternative major spatial configuration to the vertical stacking of functional units. Their design is based on an effort to produce architectural diversity in the vertical direction according to different user needs rather than the repetition of typical or similar floor plans. During the generation process of the space formation, several design criteria could be taken into consideration for example transportation integration with multi-level access; shared green and social spaces at height; cultural, environmental, and social integration (Koolhaas, 2008; Per et al., 2014; Scheeren, 2014; Safarik, 2016; Ravindranath and Menon, 2018). According to Holl (2011), "(Spatial) hybrids are (tall) buildings which the mixed-use gene in its gene code, that revitalizes the urban scene and saves space".

As profit-oriented projects, tall buildings usually provide limited green and social spaces for their users both at the ground and at height (Koolhaas, 2008; Scheeren, 2014). To overcome this low-level access of shared public facilities and bring the structure closer to human scale for creating a kind of street in the sky, several architectural features such as sky gardens, sky bridges, or sky decks could be employed in spatial hybrids (Wood, 2003; Robinson and Wood, 2014).

The Interlace (Singapore, 2013) and MahaNakhon (Bangkok, 2016) are among the most remarkable examples of spatial hybrids. However, even in these spectacular examples, it is seen that structure disrupts function somehow, where load-bearing vertical elements frustrate the users since the greater priority was given to meet other architectural objectives rather than develops to deepen an understanding of structural and architectural interactions.

Analysis of The Interlace

The 24-storey, 89m high The Interlace (Figure 2) in Singapore was designed by Office for Metropolitan Architecture (OMA) & Ole Scheeren. It

is a reinforced concrete residential complex with a shear walled frame system. The Interlace was recognized as the winner of the 'Urban Habitat Award' and a 'Best Tall Building Asia & Australasia Finalist' in the 2014 Council of Tall Buildings and Urban Habitat (CTBUH) Awards Program.

As one of the largest residential projects in Singapore with 170.000m^2 built floor area, The Interlace also called a vertical village, is a 1040-unit apartment complex consisting of 31 apartment blocks with extraordinary planning, each 6-story tall and 70m long, stacked in hexagonal arrangements around 8 large-scale, permeable courtyards, into which multi-story openings through the massing allow the light and air to weave (Interlace, 2021).

The Interlace produces not only the public spaces allowing social interaction and shared activities but also the private spaces providing individuality. In community life, these public amenities offer leisure and recreational facilities as outdoor activities. Owing to the landscaping strategy, the project embedded within the natural surrounding is attempted to generate.

This interlacing space project tries to produce an architectural prototype for the spatial hybrids thanks to architecturally well-oriented apartment blocks within the context of 'space formation' as an alternative to monotonous vertical stacking of residential units (Figure 2) (Davison, 2014; Scheeren, 2014; Safarik, 2016; Ravindranath and Menon, 2018). In this complex, hexagonal planning of 31 apartment blocks in a horizontal direction mainly generates public spaces and recreational areas.

As a result of shared socially interactive spaces with a village-like interconnection, this innovative approach of 'turning vertical isolation into horizontal integration' is based on complicated interrelation between private-public spaces and their neighboring natural environment with their distinct spatial identities.

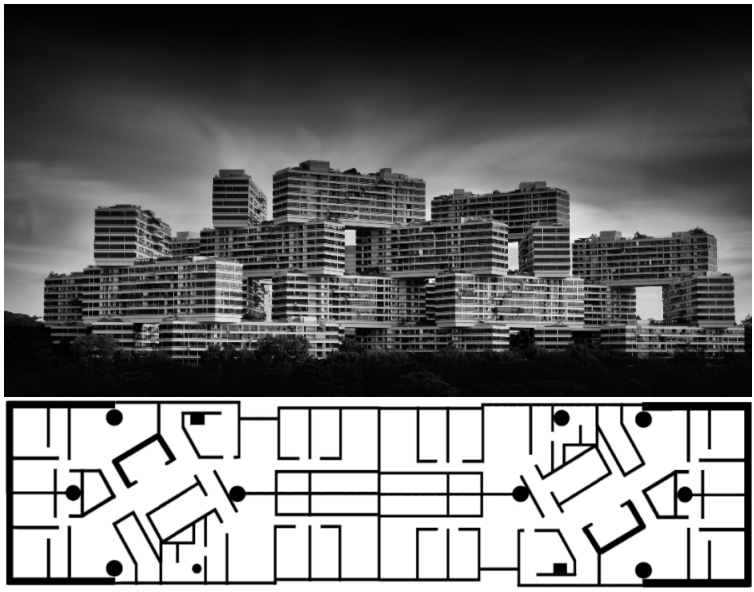


Figure 2. The Interlace, Singapore, 2013 (source: Wikipedia) and typical floor plan

Therefore, thanks to all the above-mentioned positive features, The Interlace might be an outstanding example of spatial hybrids. However, interior planning was adversely affected by structural disruptions. As seen below in the typical floor plan of this complex (Figure 2), the arrangement of structural elements - shear walls and (mega) columns - is not well integrated with the architectural plan and so flexibility in interior space use is limited to a certain degree due to strict structural configuration.

In other words, it seems that structural elements interrupt function, where structure disturbs the users as greater importance was attached to satisfy other architectural objectives. For example, particularly, mega columns in terms of not only their locations but also their size make use of space difficult and affect the transition between different spaces negatively. Large-sized structural members might tend to overwhelm occupants. Moreover, there is a repetition of the same structural configuration at floor plans, which inevitably limits the structural design role in terms of unpredictable user needs particularly over the long-term period.

Overall, even though The Interlace offers an alternative spatial configuration to vertical extrapolation of a single plan as a stunning example of spatial hybrids, structural design integrity has not been taken as an essential architectural design parameter.

Analysis of MahaNakhon

The 75-storey, 314m high MahaNakhon (Figure 3) in Bangkok was designed by Office for Metropolitan Architecture (OMA) & Ole Scheeren. It

is a reinforced concrete multi-function tower with an outriggered frame system. The name 'MahaNakhon' is derived from Thai meaning 'great metropolis'. To solve the significant problem about the height of the tower, the design team deconstructs the form of the tower by pixelation as a globally recognized design, which supplied increased height, unique residence layouts with different floor plans, connection to the street, organic form, and mix of indoor/outdoor space (Beck, 2016). As the tower dissolves toward the ground, its scale at the base is further modulated to form a multi-level topography of occupiable volumes and cascading indoor and outdoor terraces, rather than the typical podium, allowing for greater connections between the building and its surroundings.

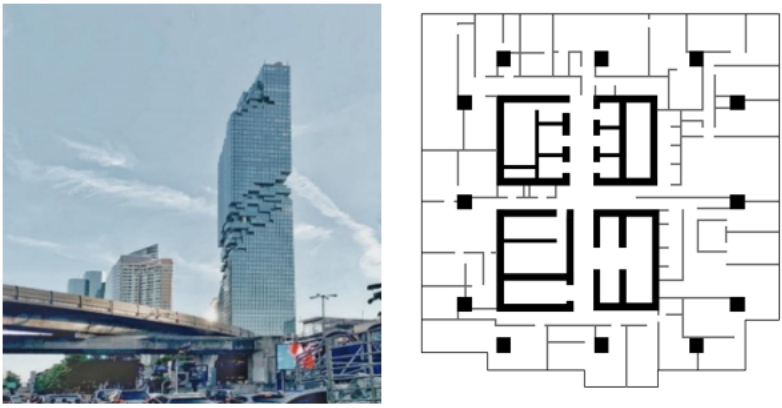


Figure 3. MahaNakhon, Bangkok, 2016 (source: Wikipedia) and typical floor plan

As in the case of The Interlace, this project tries to create an architectural prototype for the spatial hybrids due to carefully carved 3D pixelated form within the context of the urban realm as an alternative to repetitious vertical stacking of multi-functional units (Techakraisri, 2015; Techakraisri, 2016). Mass-breaking form of MahaNakhon with unique architectural pixels circling the tower's full height generates many different indoor and outdoor spaces, setbacks, and various balconies in response to user preferences, and actively engages the city and urban fabric; while the structural solution is to maintain an economic and repetitive form where possible rather than to enrich the architecture by creating opportunities for 'space-making'.

In other words, major design and engineering challenges resulting from the unique architectural form and the slender nature of the structure is tried to overcome by a conventional structural design approach, where structure satisfies only its primary load-bearing role rather than contribute architecturally and to generate aesthetic and functional richness for architectural design (Figure 3).

In addition to the facts above, there must be a structural logic searching for how structure enlivens and articulates interior spaces and contributes to building functionality to become a structural hybrid. However, as in the case

of The Interlace, large-sized structural members show the tendency to overwhelm occupants, and repetition of the same structural configuration at floor plans unavoidably limits the structural design role in terms of variable user needs over a long-term period in MahaNakhon (Figure 3).

Overall, the inference from the limitations of these case studies regarding the lack of harmony between architecture and structure is the main driving force behind the emergence of structural hybrids as a further step in the development of tall building typology.

Structural hybrids

Structure can have the potential of maximizing functional flexibility or disrupting it depending on its integration both with the design concept and the functional requirements of the building (Charleson, 2015). According to Schumacher (2014), "The adaptation of structural morphologies to the force distribution within a structural system offers a fantastic opportunity for architectural articulation. In turn, the more complex architectural orders proposed within contemporary architecture are reflected and potentially accentuated by sophisticated, adaptive structures."

Structure has a profound influence on the building functionality since it could both define and limit the activities within the building according to the degree of its physical presence both in plan and section. At that point, structural design integrity in tall buildings has also begun to come to the forefront to explore how structure contributes to and enhances building functionality.

In this respect, structural hybrids can be described as tall buildings utilizing structure as a spatial organizer, namely structurally adaptive architectural design, without scarifying spatial quality in architectural planning as in the case of spatial hybrids. In other words, they represent the building clusters which are much more than that with various functions put on top of each other with repetition of the same structural configuration for all the floor plans.

The realization of these hybrids necessitates a strengthened collaboration particularly between innovative architectural and structural designers. The utilization of structural form-finding logics disciplines the spatial morphologies in ways that are beneficial for the task of articulation including the elaboration of an organized spatial language. For example, the structural engineering logic of adjusting member sizes in proportion to stresses might be employed as an architectural strategy of articulation or the internal ordering of large spaces could be facilitated by the legitimate differentiation of the structural system (Schumacher, 2014).

Even though the design principles mentioned above have been generally putting into practice for low-rise buildings and there has no built example for high-rise ones yet, "structural hybrid" within the context of 'structure as architecture' will be a promising vision for the architects of tall buildings soon thanks to its agenda to address the issues about structure either created

the architecture or contributed a sense of excitement to it by defining space and modulating surfaces.

Overall, there might yet be no tall building project that pleases all these above-mentioned conditions nevertheless there are only a few examples gently caring about their spatial quality but still including missing parts in terms of integration between architectural planning and structural design flexibility as in the case of The Interlace and MahaNakhon. The limitation of these buildings regarding unjoined architectural and structural features is the focal driving force behind the generation of structural hybrids, where structure contributes architecturally, rather than in its principal load-bearing role, it supports other dimensions of aesthetic and functional richness to designs by becoming an inseparable part of the architecture, which produces architecture itself, its quality and excitement.

CONCLUSION

As a result of increased urban population and associated pressure of urban land and built environment, ever-increasing number and density of vertical cities, namely tall buildings, have been gaining more and more important in terms of searching for contemporary building typologies, where most of them internationally follow the standard template of the rectilinear, air-conditioned, western 'box' with lack of spatial quality. Unfortunately, this approach results in the generation of a frightening homogeneity in tall building design across global urban centers, namely the creation of a 'one size fits all'.

Tall building design usually has begun to exaggerate aesthetics or reach the most feasible space planning from a financial point of view while paying less attention to structure, where issues relating to the structure are characteristically addressed after articulation of architectural form - which unavoidably limits the structural design role to solving the problem rather than integrating the structural system into the architectural space planning.

Most of the tall buildings seem to have been designed as vertical extrusions of an efficient but monotonous floor plan without taking into consideration structural design flexibility rather than as a direct product of a close and meaningful collaboration between the architect and the structural designer.

As a general approach, an architect and a structural designer read a structure quite differently owing to their different professional interests and concerns. An architect concentrates on how structure affects the surrounding space, whereas a structural designer most likely perceives structure as simplifying a load path. However, it is a fact that as an indispensable component of architecture, the structure should be integrated with and involved in the making of architecture.

In other words, structure could be used to define space, articulate circulation, suggest movement, or develop modulations (Charleson, 2015). In this way, it turns into indistinguishably connected to the very elements which generate architecture with its quality and excitement. Nevertheless,

in the structural design of tall buildings, all the structural elements are constructed repetitively throughout the building height by ensuring required optimization in cross-sectional sizes from bottom to top according to the structural calculations and related codes & standards by disregarding the above-mentioned addressed issues.

In this context, hybrids have begun to be recognized as a new architectural prototype - but not yet in all their aspects of functional, spatial, and structural potentials. In other words, there might thus far be no tall building project that satisfies all these potentials and there is a limited number of tall buildings just gently caring about their spatial quality as in the case of The Interlace and MahaNakhon. As the most developed type of hybrids in terms of spatial quality enriched by the structure itself, structural hybrids have a great potential to shape the future of tall building typology, where the structure enlivens and articulates spatial quality.

REFERENCES

Al-Kodmany, K. and Ali, M.M. (2016). An Overview of Structural and Aesthetic Developments in Tall Buildings Using Exterior Bracing and Diagrid Systems, International Journal of High-Rise Buildings 5 (4): pp.271-291.

Ali, M.M. and Armstrong, P.J. (1995) Architecture of Tall Buildings, Council on Tall Buildings and Urban Habitat Committee 30, McGraw-Hill, Inc., New York.

Bagley, F. (2018). The Mixed- Use Supertall and Hybridization of Program, International Journal of High-Rise Buildings, Vol.7, No.1, pp.65-73, March.

Beck, K. (2016). MahaNakhon Thailand's Tallest Tower, CTBUH 2016 China Conference.

Charleson, A. (2015). Structure as Architecture, Routledge, 2nd edition, New York, USA.

CTBUH. Council on Tall Buildings and Urban Habitat. Illinois Institute of Technology, S.R. Crown Hall, 3360 South State Street, Chicago, Illinois, USA. Retrieved from www.ctbuh.org.

Davison, N. (2014) China's Obsession with Vertical Cities, The Guardian, October.

Fenton, J. (1985). Pamphlet Architecture 11: Hybrid Buildings, Princeton Architectural Press.

Gunel, M.H. and Ilgın, H.E. (2014a). Tall Buildings: Structural Systems and Aerodynamic Forms, London and New York: Routledge.

Gunel, M.H. and Ilgın, H.E. (2014b). Yüksek Binalar: Taşıyıcı Sistem ve Aerodinamik Form, METU, Publication of Faculty of Architecture, Ankara, December. (ISBN: 978-975-429-278-7) (2nd edition)

Henn, M. and Fleischmann, M. (2015). Novel High-rise Typologies – Towards Vertical Urbanism, CTBUH 2015 New York Conference.

Ilgın, H.E. (2018). Potentials and Limitations of Supertall Building Structural Systems: Guiding for Architects. PhD Dissertation, Department of Architecture, Middle East Technical University, Ankara.

Ilgın, H.E. (2021). Space Efficiency in Supertall Office Buildings, Journal of Architectural Engineering, Vol. 27, Issue 3.

Ilgın, H.E., Ay, B.O., Gunel, M.H. (2021). A Study on Main Architectural and Structural Design Considerations of Contemporary Supertall Buildings, Architectural Science Review, Vol. 64, Issue 3, pp. 212-224.

Holl, S. (2011). Prologue, This is Hybrid, Spain.

Interlace. (2021). Büro Ole Scheeren. Retrieved from https://buro-os.com/projects/the-interlace.

Jacobs, J. (1961). The Death and Life of Great American Cities, Vintage Books.

Kim, H. (2004). Space Efficiency in Mixed-use High-rise Building, PhD dissertation, Illinois Institute of Technology, Chicago.

Kim, H. and Elnimeiri, M. (2004). Space Efficiency in Multi-Use Tall Building, Tall Buildings in Historical Cities - Culture and Technology for Sustainable Cities, October 10-13, Seoul, pp. 748-55.

Koolhaas, R. (2008). Challenging Preconceptions of the High-Rise Typology, CTBUH 8th World Congress, pp. 54-58, Dubai.

Park, S.M. (2005). Tall Building Form Generation by Parametric Design Process, PhD dissertation, Collage of Architecture, Illinois Institute of Technology, Chicago.

Per, A.F., Mozas, J., Arpa, J. (2014) This is Hybrid: An Analysis of Mixed-Use Buildings, A+t Architecture Publishers.

Ravindranath, S.S. and Menon, S.J. (2018). Exploring New Paradigms in High-Density Vertical Hybrids, International Journal of High-Rise Buildings, Vol.7, No.2, pp.111-125, June.

Robinson, J. and Wood, A. (2014). Beyond Icons: Developing Horizontally in the Vertical Realm, Future Cities: Towards Sustainable Vertical Urbanism, 2014 Shanghai Conference Proceedings, pp.81-88.

Rowley, A. (1996). Mixed-Use Development: Ambiguous Concept, Simplistic Analysis and Wishful Thinking?, Planning Practice & Research 11(1), pp.85-98.

Safarik, D. (2016). The Other Side of the Tall Buildings: The Urban Habitat, CTBUH Journal, Issue 1, pp.20-25.

Salingaros, N.A. (1998). Theory of Urban Web, Journal of Urban Design 3(1), pp. 53-71.

Scheeren, O. (2014). Space Formations, CTBUH 2014 Shanghai Conference Proceedings, pp.67-74.

Schumacher, P. (2014). Tectonic Articulation: Making Engineering Logic Speak, Architectural Design.

Talen, E. and Knaap, G. (2003). Legalizing Smart Growth: An Empirical Study of Land Use Regulations in Illinois, Journal of Planning Education and Research 22, pp.345-359.

Techakraisri, S. (2015). MahaNakhon: A Pixelated Punctuation Mark on the Bangkok Skyline, CTBUH Conference Proceedings.

Techakraisri, S. (2016). Bangkok and the MahaNakhon Tower, CTBUH Conference Proceedings.

Wood, A. (2003). Pavements in the Sky: Use of Skybridge in Tall Buildings, Architectural Research Quarterly, pp.325-332.

MOBILITY IN MICRO HOUSE COMPETITIONS

Refia GÜNGÖR[1], Nihan ENGİN [2]

[1] *Karadeniz Technical University, Turkey*
refiagungorr@gmail.com
[2] *Karadeniz Technical University, Turkey*
nengin@ktu.edu.tr

ABSTRACT

As in all fields, it is usual to describe the buildings that are preferred by less in the field of architecture, which have not become widespread, that we are not used to seeing around us as "other". Mobile structures have been the primary structure or "other structure" according to the mobility and needs of the people/societies of the period during which they were used throughout human history.

One of the mobile structures that we can refer to as another structure in the field of architecture is micro houses, which are much smaller than the spatial dimensions of today's houses with their spatial dimensions.

In this study, the other concept is discussed through the mobility capabilities of micro houses. The aim is to investigate the position and importance of mobility in homes to be built today and in the future by questioning the state of mobility in micro houses. Within the scope of the study, a total of twelve projects that won first, second and third awards and honorable mention in Microhome-2019 and Microhome-2020 design competitions were examined under the headings of motivation, off-grid systems and structural materials.

As a result of the study, it was observed that although mobility is not required in the competition project, the majority of projects have a mobile feature, mobility does not cause changes in the off-grid systems of micro houses, but affects the choice of structure material, mobility ability has become one of the important features for micro houses.

Key Words: Mobile Architecture; Micro House; Other.

INTRODUCTION

The developments in our lives change us, and we change our needs. Our changing needs change the environment we live in and our spaces of various scales (Berdan, 2010). One of the concepts that affect this change and that we can clearly observe is “mobility”. Mobility derived from the word mobile (Mobile, n.d.), which means moving, portable is the state of being mobile and means dynamism, fluidity (Akgül, 2006; Şengül, 2019). While it is possible to talk about the increasing mobility of the object, communication instruments and means of transportation with the technological changes experienced, the mobility of the individual becomes possible with them and increases in parallel with the developments experienced day by day.

Since it is a working space that shapes our living spaces, makes human-oriented design and production, and therefore feeds on human life, it is thought that architecture interacts directly with the phenomenon of mobility, which is an important part of life, and triggers elements of mobility in architecture (Berdan, 2010).

Mobile architecture

The correlation of mobility and architecture/living spaces dates back to the time when mankind lived as a nomad. Tent is the first example of mobile spaces that can be moved, disassembled and transported in harmony with the lifestyle of the nomadic culture, which expresses an active life. The use of mobile structures, which are the primary living space as a reflection of the way of life of nomadic societies, has changed in terms of usage priority with the change of the way of life of mankind. So much so that with the decrease in mobility of the person who moved from nomadic life to settled life and connected to the soil, mobile structures were replaced by stable; non-mobile structures. Thus, while the primary living space of societies and individuals is stable, mobile structures have become "other structures".

Despite the long-standing dominance of stable architecture that began with the beginning of settled life, changing living conditions and technological changes today present mobile architecture as a new culture of life (Akgül, 2006).

Mobile structures that exist in many different techniques, forms and functions are also preferred as living spaces for different purposes due to the many advantages they provide.

Sometimes, thanks to the possibilities of easy transport, installation and dismantling and flexibility, it is used in situations requiring immediate aid such as natural disasters and war (Akbas, 2010), while sometimes it is used as living spaces that can adapt to changes in the way of life of human beings and respond to differentiated individual needs.

Micro House

Micro Houses are houses with relatively less usage areas compared to the houses we live in. Dimensionally, although there is no official square meter restriction, structures with an area of less than 28m² (300ft²) are called micro houses; however, they can be as large as 46m²(500ft²) and as small as 8m²(84ft²) (Iglesias, 2014).

Micro Houses, which offer a user-oriented design in accordance with the wishes and needs of users, are structures that can be purchased, rented or built by the user and offer a detached life (Iglesias, 2014).

Micro-houses, which have become very popular in recent years with different purposes and approaches, are much more economical in terms of construction and maintenance than traditional houses, offer ideal solutions to reduce material use [Mikro ev trendi, (n.d.)] and are an economical option for owning a home [Iglesias, 2014; Micro units: (Bollard, 2019)]. It also has a sustainability perspective, according to the definition of “what is a micro house?: (Cavallari, n.d.)]” that is strategically designed to maximize usable space while minimizing its ecological footprint. Micro Houses, which offer a new, efficient and sustainable form of housing life to help us adapt to climate change, including reducing carbon emissions from vehicles, are being considered as a solution to the environmental crisis (Iglesias, 2014).

Micro-houses, which have various advantages ecologically or economically, "try to facilitate human life and minimize the damage to the environment in general, are seen as a source of freedom for the need for housing" [Mikro ev trendi, (n.d.)].

Aim of the Study

The aim of this study is to examine the mobility of mobile structures, which are less applied in the world of architecture than stable structures and which we call "other structures", on Micro Houses in the field of architecture.

In line with this purpose, designs that won honorable mentions in the "Microhome" international design competition, which is one of the architectural competitions that allow freer and more innovative productions in terms of architecture, were examined. Whether or not the examined designs have a mobile feature and other design decisions taken accordingly were evaluated.

METHOD

The aim of Microhome architectural design competitions, the first in 2019 and the second in 2020, organized by Bee Breeders, is to seek innovative ideas to better serve our changing world against the problem of increasing affordable housing crisis and depletion of natural resources in the face of climate and economic crises.

Participants were asked for an off-grid, modular structure that could accommodate a hypothetical young professional couple. Projects can be set on any hypothetical site, of any size, anywhere in the world. The only project requirement is that the total floor does not exceed 25m². Mobility is not a required for competition.

Projects were examined under the headings of mobility, construction material, off-grid system and motivation and analysis tables were created with the information obtained. The headings in the tables analysed;

Mobility, with reference to the mobility classification of tiny houses, under the headings of “fully mobile, partly mobile and permanent house” (Shearer, Bares, Pieters, Winkle, & Meathrel, 2019; Shearer & Burton, 2019),

Structure material, under the headings of "traditional structure material (wood, steel, concrete) and innovative structure material (3D printed construction, recycled plastic)" to examine the effect of the mobility of micro houses on the selection of structure material,

Off-Grid Systems, under the headings of “solar panel, rainwater collection system and gray water treatment system”, in order to examine the effect of the mobility of the structures on the selection of the systems necessary to create an off-grid structure,

Motivation, taking into account the advantages of micro houses expressed in the "micro house" section, under the headings of "sustainable living, economy and minimalism" to reveal the main purpose of the structure.

Microhome 2019-Small Living, Big Impact!

Within the scope of the study, (1st prize) Shifting Nests, (2nd prize) MIKADO, (3rd prize) Compact House, (Honorable Mention I) Mekong Delta "Thuyen Nha", (Honorable Mention II) Pioneer Living, (Honorable Mention III) Suber House (Microhome competition, 2019) projects were reviewed. Information about the projects is given in Table 1-6.

Table 1. First Prize Winner/Microhome 2019

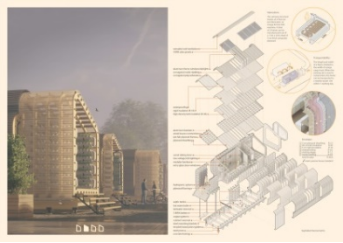
First Prize Winner 2019		Microhome competition
Project Name	Shifting Nests	
Country	Canada	
Project Authors	Jerry Liu Jesse Basran	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	x
Motivation	Sustainability	x
	Economy	x
	Minimalism	

Table 2.Second Prize Winner/Microhome 2019

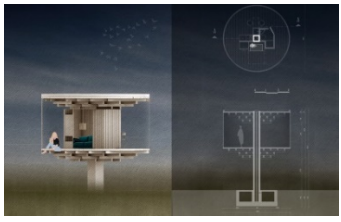
Second Prize Winner 2019		Microhome competition
Project Name	Mikado	
Country	Bulgaria	
Project Authors	Bilyana Apostolova Slavena Todorova	
Mobility	Fully mobile	
	Partly mobile	
	Permanent	x
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	
	Minimalism	

Table 3. Third Prize Winner/Microhome 2019

Third Prize Winner 2019		Microhome competition
Project Name	Compact House	
Country	Sweden	
Project Authors	Raina Kanari	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	x
Motivation	Sustainability	x
	Economy	x
	Minimalism	

Table 4. Mention I / Microhome 2019

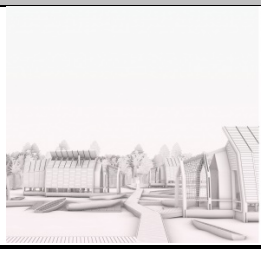
Honorable Mention- I 2019		Microhome competition
Project Name	Mekong Delta "Thuyen Nha"	 
Country	United States	
Project Authors	John Perez Bradley Kreuger	
Mobility	Fully mobile	x
	Partly mobile	
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	x
	Minimalism	

Table 5. Honorable Mention II/Microhome 2019

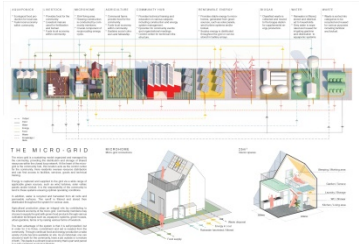
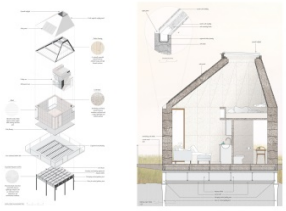
Honorable Mention- II 2019		**Microhome competition**
Project Name	Pioneer Living	
Country	Sweden	
Project Authors	Brendan Cooney Parto Jahangiri Minh Quang Do Arvin Nadimi	
Mobility	Fully mobile	
	Partly mobile	
	Permanent	x
Structure material	Traditional	-
	İnnovative	-
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	
	Minimalism	

Table 6. Honorable Mention III/Microhome 2019

Honorable Mention- III 2019		**Microhome competition**
Project Name	Suber House	
Country	United States	
Project Authors	Jolanda Devalle Alison Zuccaro	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	
	Gray water treatment	
Motivation	Sustainability	x
	Economy	x
	Minimalism	

Microhome 2020-Small Living, Big Impact!

Within the scope of the study, (1st prize) Horror Vacui, (2nd prize) Bri., (3rd prize) Anonymous Watchman, (Honorable Mention I) The High Sierra, (Honorable Mention II) Clochan, (Honorable Mention III) Pivot House (Microhome competition, 2020) projects were reviewed. Information about the projects is given in Table 7-12.

Table 7. First Prize Winner/microhome 2020

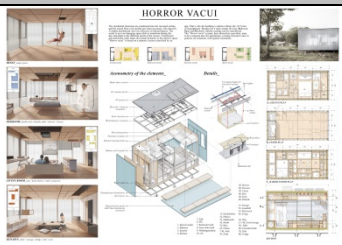
First Prize Winner 2020		**Microhome competition**
Project Name	Horror Vacui	
Country	Italy	
Project Authors	Giovanni Cavaglion Pu Wang Emanuele Cavaglion Xiaoxu Liang	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	x
Motivation	Sustainability	
	Economy	
	Minimalism	x

Table 8. Second Prize Winner/Microhome 2020

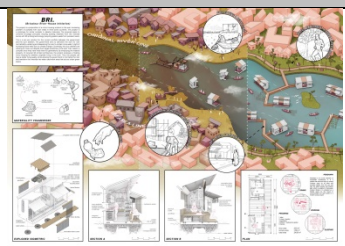
Second Prize Winner 2020		**Microhome competition**
Project Name	Bricoleur River-House Initiative	
Country	Australia	
Project Authors	Georgia Huang Andrew Kurniawan Leonardo Vincent	
Mobility	Fully mobile	x
	Partly mobile	
	Permanent	
Structure material	Traditional	
	İnnovative	x
Off-grid system	Solar panel	
	Rainwater collection	x
	Gray water treatment	x
Motivation	Sustainability	x
	Economy	
	Minimalism	

Table 9. Third Prize Winner/Microhome 2020

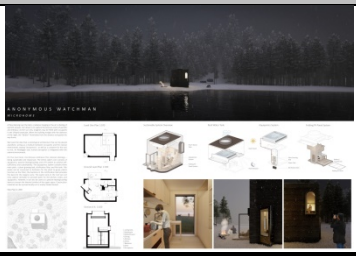
Third Prize Winner 2020		**Microhome competition**
Project Name	Anonymous Watchman	
Country	Australia	
Project Authors	Jinlong Li Sen Yan Xibao Ren Huichao Luo	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	
	Minimalism	

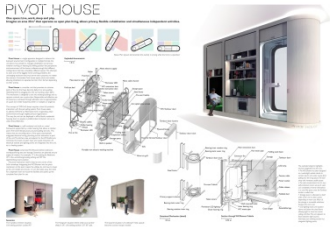
Table 10. Honorable Mention I/Microhome 2020

Honorable Mention- I 2020		Microhome competition
Project Name	The High Sierra	
Country	Mexico	
Project Authors	Mauricio Bastidas Azotla	
Mobility	Fully mobile	
	Partly mobile	
	Permanent	x
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	
	Minimalism	

Table 11. Honorable Mention II/Microhome 2020

Honorable Mention- II 2020		Microhome competition
Project Name	Clochán	
Country	Ireland	
Project Authors	Ben Mc Quaid	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	
	İnnovative	x
Off-grid system	Solar panel	x
	Rainwater collection	x
	Gray water treatment	
Motivation	Sustainability	x
	Economy	x
	Minimalism	

Table 12. Honorable Mention III/Microhome 2020

Honorable Mention- III 2020		Microhome competition
Project Name	Pivot House	
Country	United Kingdom	
Project Authors	Ibrahim Muasher Gergana Popova Simon Taylor	
Mobility	Fully mobile	
	Partly mobile	x
	Permanent	
Structure material	Traditional	x
	İnnovative	
Off-grid system	Solar panel	-
	Rainwater collection	-
	Gray water treatment	-
Motivation	Sustainability	x
	Economy	
	Minimalism	x

CONCLUSION

Mobile buildings, as a symbol of the lifestyle of today's people, have found their place in many different functions, especially in housing. Micro houses are also mobile houses that emerged as a reflection of the new lifestyle that developed with human mobility.

In this study, the mobility of micro houses was searched through micro house competitions.

In the Microhome competitions organized as an architectural series by Bee Breeders in 2019 and 2020, the only requirement is to limit the usage area of the house to 25m², and apart from that, the location of the house, the materials, the systems to be used and the motivation of the house to be used, for which purpose and where it will serve are up to the designers' decision.

In this study, a total of 12 designs that won awards in two competitions were analyzed with tables created under the headings of mobility, structural material, off-grid systems and motivation, which were up to the participants' decision. As a result of the analysis, the following conclusions were reached.

Mobility: In 2019, 4 out of 6 projects were designed as mobile, in 2020 5 out of 6 projects were designed as mobile. The fact that the designers designed a mobile structure as a solution to the problems they determined in the competition, where the condition of being mobile is not required, shows that the tendency towards mobile thinking in architecture has increased.

Structure: In 2019, 5 of the 6 projects used traditional materials, while 1 did not specify. In 2020, 4 out of 6 projects used traditional materials and 2 used innovative materials. In mobile projects, materials such as wood, steel, 3D construction material and recycled plastic are used, while stone and concrete are used in 2 of the 3 permanent structures. This shows that the structural material is effective in the mobility of the building and the structure should be light enough to enable the structure to be easily transported.

Off-grid systems: In the projects examined, at least one of the solar panel, rainwater collection and gray water recovery systems was used. It shows that the mobility type of the structures is not effective in the selection of these systems, which reduce or completely remove the dependence on the grid in terms of needs such as electricity and water, and that both permanent and mobile structures can be off-grid.

Motivation: All of the projects examined are designed in light of at least one of the motivations for sustainability, economy and minimalism to solve the location of the structure or a global problem.

As a result of the analyzes, all of the projects awarded in the micro house competitions, which are limited to 25m², are designed for motivation and to improve a lifestyle. Most of the winning projects in the competitions, which do not have the requirement to be mobile, have brought mobile solutions to the problems they have identified. It has been concluded that the mobility of the structures does not make a difference in the use of the off-grid system, and the weight is effective for the mobile structures in the choice of structural materials.

With the prominence of mobile structures in competitions where ideas and problems are clearly expressed and innovative and original approaches to future problems take place, it makes it possible to think that mobile structures can take their place in the center of architecture by leaving the status of "other structure".

In addition, competitions for small scale design such as micro house, which offers an experimental working environment, are seen as valuable because they pave the way for the practice of innovative ideas developed in competitions in larger-scale design.

REFERENCES

Akbaş, E. (2010). Ekolojik Mobil Konutların Teknolojisi Ve İç Mekan Düzenlemelerinin İncelenmesi, Master Thesis, Mimar Sinan Fine Art University, Institute of Fine Arts, İstanbul, 2010.

Akgül, A. (2006). Mimarlıkta Mobilite Kavramı: Göçebe Çingenele ve Sirk Yaşamı Üzerine Bir İnceleme, Master Thesis, İstanbul Technical University, Natural And Applıed Scıences, İstanbul.

Berdan, C. (2010). Mimaride Hareketliliğin Farklı Süreçlerdeki Mekansal Etkileri Üzerine Bir Değerlendirme, Master Thesis, İstanbul Technical University, Natural And Applıed Scıences, İstanbul.

Bollard, S. (2019). Micro-Units: Another Tool in your Affordable Housing Toolbelt. Retrieved from: https://mrsc.org/Home/Stay-Informed/MRSC-Insight/December-2019-1/Micro-Units-Another-Affordable-Housing-Tool.aspx

Cavallari, D.(n.d.). What is a micro house?. Retrieved from: https://www.homequestionsanswered.com/what-is-a-micro-house.htm

Iglesias, Tim, The Promises and Pitfalls of Micro-Housing (November 1, 2014). Zoning and Planning Law Report 37.10 (2014): 1-12, Univ. of San Francisco Law Research Paper No. 2015-02, Available at SSRN: https://ssrn.com/abstract=2536192

Mikro ev trendi. (n.d.). Retrieved from: https://www.arkitektuel.com/mikro-ev-tasarimina-ornek-10-yenilikci-tasarim/

Mobile, (n.d.). Retrieved from: Https://Sozluk.Gov.Tr/

Microhome competition. (2019). Microhome 2019-Small Living, Big Impact! Competitions 2019 Results. Retrieved from: https://architecturecompetitions.com/microhome2019/

Microhome competition. (2020). Microhome 2019-Small Living, Big Impact! Competitions 2020 Results. Retrieved from: https://architecturecompetitions.com/microhome2020/

Shearer, H., Bares, V., Pieters, R., Winkle, B., & Meathrel, K. (2019). Planning for tiny houses. Australian Planner. 55. 147-156.

Shearer, H., Burton, P. (2019). Towards a Typology of Tiny Houses, Housing, Theory and Society, 36:3, 298-318, DOI: 10.1080/14036096.2018.1487879

Şengül, G. (2019). Mobil Konut Bağlamında, Zamanın Değişen İhtiyaçlarına Karşı Mekansal Arayışlar: Tıny House Örneği, Master Thesis, Marmara University, Institute of Fine Arts, İç Mimarlık Anasanat Dalı, İstanbul.

Şenocak, G. (2019). Türkiye'deki Mülteci Kamplarında Geçici Konut Tasarım Örneği Olarak Sarıçam Kampı'nın Mekansal Analizi, Master Thesis, Hacettepe University, Institute of Fine Arts, Ankara

TRANSITION FROM NEARLY ZERO ENERGY BUILDING TARGETS TO NET ZERO AND POSITIVE ENERGY BUILDINGS

Nurşen SÖNMEZ[1], Sibel MAÇKA KALFA[2]

[1]Recep Tayyip Erdogan University, Turkey
nursen.sonmez@erdogan.edu.tr
[2]Karadeniz Technical University, Turkey
sibelmacka@ktu.edu.tr

ABSTRACT

The energy efficiency of buildings in the European Union is based on directives and the most effective directive for energy efficient building design is the Energy Performance of Buildings Directive (EPBD). The Directive was first published in 2002 and then revised in 2010 and 2018. Nearly zero energy buildings (nZEB) with the 2010 Recast EPBD from member states; With the 2018 revision, it was requested to determine the 2030 targets. With these targets, the EU aims to achieve carbon-neutral buildings by 2050. The European Commission wanted member states to define nZEBs and to create their own national legislation and plans considering climate data. Some countries have already exceeded these targets set by the EPBD. In this study, the countries of the Netherlands, Germany, Denmark, and France, which set goals beyond both the EU Council and other EU member states, were examined. Starting from the nZEB targets defined by the EPBD, the development of these four member countries, which are in approximately the same climate zone, towards Net Zero Energy Buildings (NZEB) and Positive Energy Buildings (PEB), which are the targets they set later, are examined. In the study, high performance building (NZEB and PEB) designs, which are the targets set by these countries, are discussed. These strategy approaches are compared. The road map that Turkey should follow for the transition to these designs is given.

Key Words: European Union (EU); Energy Performance of Buildings Directive (EPBD); Nearly Zero Energy Buildings (nZEB); Net Zero Energy Buildings (NZEB); Positive Energy Buildings (PEB).

INTRODUCTION

With the energy crisis in the 1970s, studies on energy efficiency increased rapidly. Strategies to minimize energy consumption have begun to be developed in sectors where energy consumption is intense, such as transportation, industry, and construction. When we look at the buildings that form the building sector among these sectors, it is seen that they are responsible for 40% of the energy consumption worldwide. It is known that they are responsible for approximately 40% of total primary energy consumption and 36% of greenhouse gas emissions in Europe (EU Commission, 2020). These high energy consumptions and the emission rates they cause have shown that energy efficiency in buildings and emissions should be reduced. Strategies and targets for energy efficiency in buildings should be determined and solutions should be presented. Within the scope of solution proposals, many countries have published various legal regulations (laws, standards, directives, regulations, etc.) and signed international agreements. The alternative and sustainable approach is energy saving and promoting energy efficiency and renewable resources (Danish Energy Agency, 2015). European Union (EU) member countries tried to increase the energy efficiency of buildings with a purely technical approach in the early 1970s. This has led to the adoption of the passive design approach. Buildings, however, require unconventional measures to ensure an energy efficient, renewable energy-based and climate-neutral built environment (Attia, 2020). In other words, higher and more complex performance requirements are expected from buildings (Kolokotsa et al., 2011). In addition, floor space in the building industry worldwide is expected to increase by 75% between 2020 and 2050 (IEA, 2021). These requirements have enabled the European Council to prepare overarching regulations on a building basis.

Energy Performance of Buildings Directive (EPBD) and Nearly Zero Energy Buildings (nZEB)

In the European Union, in the member states, the energy efficiency of buildings is based on directives and the most effective directive for energy efficient building design is the EPBD. This directive is one of the first basic and unified European legal instruments for energy policy in buildings. In 2002, minimum energy performance requirements and energy performance certificates were requested from member countries with the EPBD (EU Commission, 2002). With its revision in 2010, the Directive has set targets for energy saving and reducing greenhouse gas emissions for the national minimum energy performance accepted by the member states (EU Commission, 2010). One of the most important of these goals is nearly zero energy buildings. A nearly zero energy building is a building with very high energy performance. The almost zero or very low amount of energy required "must be very significantly met by energy from renewable sources, including energy from renewable sources produced on or near it" (EU Commission, 2010). With this directive, the European Commission wanted member states to define nZEBs and create their own national legislation and plans, considering climate data. Thus, differences in approaches and goals have

emerged among the member states. Figure 1 presents the EPBD development framework.

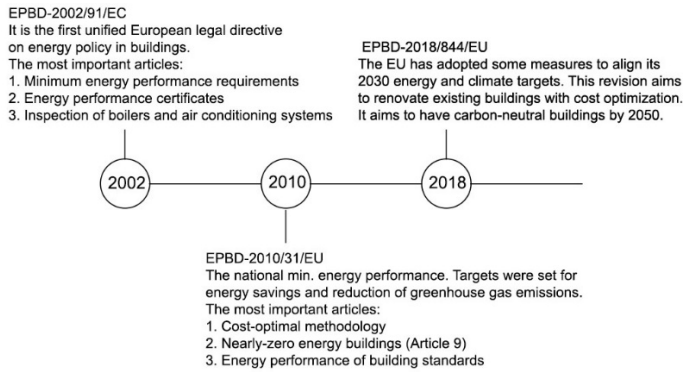


Figure 1. EPBD development framework (EU Commission, 2002; EU Commission, 2010; EU Commission, 2018).

EPBD defined nZEB in its ninth article and took various decisions to reach these buildings. The goals of these decisions are (EU Commission, 2010):

a) by 31 December 2020, all new buildings are nearly zero-energy buildings; and
b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero energy buildings.

The EU goals to achieve carbon-neutral buildings by 2050 (Economidou et al., 2020). Thus, based on these short and long-term goals, some member states of the EU, Western and Northern European countries, unlike other member countries, set targets that exceed nZEB. From these countries; Netherlands zero energy buildings, Germany climate-neutral buildings, Denmark, and France positive energy buildings (BPIE, 2015). Figure 2 shows the transition of a building towards positive buildings.

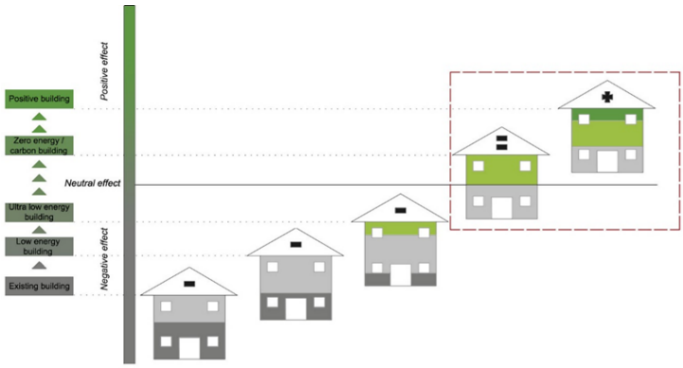


Figure 2. The development of a building towards positivity (Attia, 2016).

Directive 2018/844 determine various strategies. These strategies are implemented using building automation and control technologies, as well as the introduction of smart grids for energy sharing (EU Commission, 2018). It can be said that this situation creates a basis for NZEB and PEBs. It aims to transform the EU building stock into an energy efficient, highly energy efficient and energy producer by converting nearly zero energy buildings into positive energy buildings to achieve Europe's 2050 carbon neutrality target (EXCESS, 2020). However, the definitions of NZEB and PEB, just like nZEB, do not yet have specific definitions. These buildings are defined as net zero energy (NZEB) buildings that balance their energy consumption, producing their own energy using renewable energy, and positive energy (PEB) buildings that produce more energy from renewable sources than they consume and supply them to the grid (Cole & Fedoruk, 2015). In short, there is production equal to or more than consumption in buildings (Kolokotsa et al., 2011). The building sector requires the integration of energy efficiency and renewable energy use in buildings based on sustainable development (Feng et al., 2019). With this integration, the NZEB and PEB concept is seen as one of the best potential solutions to increase efficiency and reduce energy consumption in buildings.

Net Zero Energy Buildings (NZEB)

The term zero-energy building was first defined in Denmark in 1976 by researching solar energy to heat buildings (Torben, 1977). A ZEB highly combines energy efficient building designs, technical systems, and equipment to minimize heating and electricity demand with renewable energy generation, often including a solar hot water generation system and a rooftop PV system (Torcellini and Crawley, 2006). Reducing energy consumption is the first step towards a net zero energy target and formed the basis of NZEBs at Passive House in AB (Hu and Qiu, 2019). Passive House energy saved in heating is 80% compared to traditional new housing standards (Zeiler and Boxem, 2013). Energy requirements in net zero energy buildings are usually provided by renewable sources and energy storage systems (Mehrjerdia et al., 2019).

Net ZEB ⟶ Energy Balance=weighted supply - weighted demand = 0 (1) (Ascione et al., 2016).

The main requirements of the NZEB design (Attia et al., 2012):

1. Metric
2. Comfort level and climate
3. Passive strategies
4. Energy efficiency
5. Renewable energy systems (RES)
6. Innovative solutions and Technologies

Positive Energy Buildings (PEB)

A positive energy building is a concept aimed at a positive primary energy balance on an annual basis, by generating electricity with energy savings and renewable resources (Thiers and Peuportier, 2012) The term PEB has started to appear in the literature since 2008 (EXCESS, 2020). The maximum allowable primary energy demand for zero energy buildings has been determined as 20 kWh/m²y for both new and existing buildings (Marszal ve Heiselberg, 2009). PEB concept and PEB design requirements are given in Figure 3.

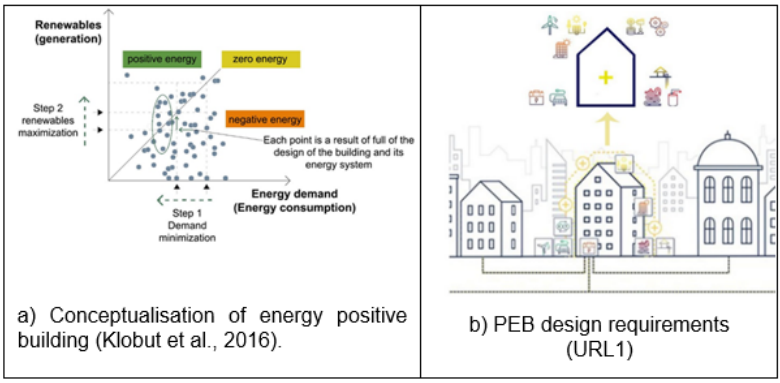


Figure 3. PEB concept and design

Requirements of NZEB and PEB definition

Requirements of the NZEB definition

To make a general definition of NZEB, the uncertainties in nZEBs need to be defined below the net zero energy requirements. These; The balance criterion is the balancing period, the energy use included in the balance, the energy balance type, the renewable energy supply options accepted, the energy infrastructure and energy efficiency, the building type, the climate and the type of production technology, the building grid interaction, and the user behaviour (Voss et al., 2012; Guerra-Santin et al., 2018).

Requirements of the PEB definition

The main criteria to be considered can be grouped as follows for the development of the definition of PEB. Boundary of the system (physical boundary, energy boundary, boundary conditions), net balance (balancing period, type of balance, energy efficiency, energy supply), weighting system (metrics, symmetry, time dependent accounting), temporary energy matching characteristics (load matching, grid interaction) and

measurements (Sartori et al., 2012). These requirements are given in Figure 4.

Figure 4. The elements to be included in the PEB definition (EXCESS, 2020).

NZEB and PEB Performance

Performance design of a PEB is possible with proper design, control and management of systems through Building Control Systems (BCS) and Building Management Systems (BMS) (Figure 5).

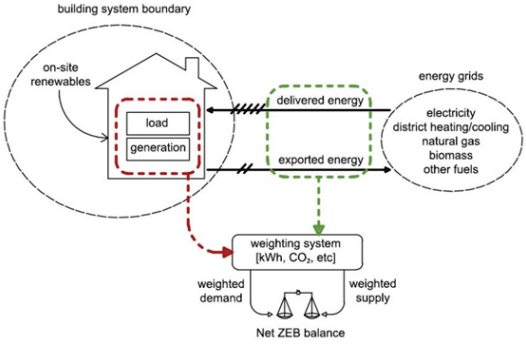


Figure 5. Energy production-consumption diagram for energy balance (Sartori et al., 2012).

Grids provide energy to the building or to receive energy from the building. These grids are used for electricity, heating and cooling etc. it could be (Sartori, 2012). The positive energy building must have energy that can be stored on site and fed into the bidirectional grid. Energy should be produced from renewable sources with no or limited carbon footprint (EXCESS, 2020; Cole and Fedoruk, 2015). In Figure 6, the design options and design space of photovoltaics for NZEB and PEB design are given.

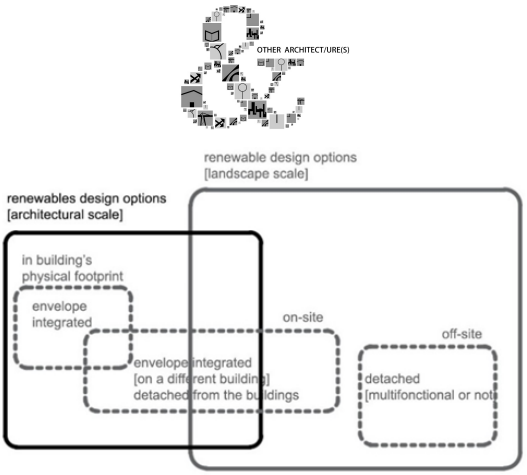


Figure 6. Energy use boundary system and design area (Scognamiglio and Garde, 2014).

Energy management systems always involve the uncertainties of renewable energies. These uncertainties should be appropriately modelled and addressed (Mehrjerdia et al., 2019). Renewable energy supply option as hierarchy (Torcellini, 2006):

1. Emission-free
2. Reduced transport and conversion losses
3. It can be used for the life of the building and
4. Sellable, usable, and repeatable

Building Management Systems (BMS)

Building energy management system requirements are as follows (Rotger-Griful et al., 2017):

- Monitoring the building's energy use and related external information (eg weather forecast)
- Optimal control of distributed energy sources within the building (energy efficiency)
- Provide a third party (aggregator) request response and enable load collection
- Empowering consumers by providing information and energy-related advice

The components of a ZEB / PEB architecture and the monitoring and infrastructure of a ZEB / PEB system are given in Figure 7.

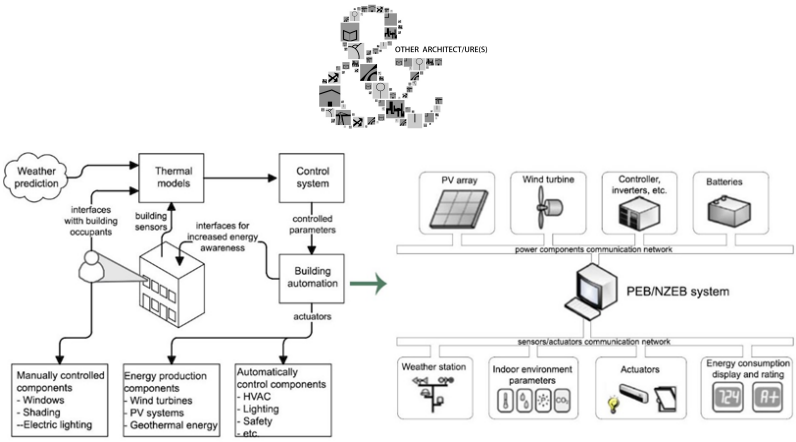


Figure 7. ZEB / PEB building management system (Kolokotsa et al., 2011).

Comparison of NZEB and PEB

Zero or positive energy approach; climate data, geometries, building physics, HVAC systems, power generation systems, natural ventilation, user behaviour (usage, internal gains, manual shading) etc. Detailed simulation is required to consider (Kolokotsa et al., 2011). It shows that there are statistically significant differences in energy consumption among different types of households. In this case, the behaviour of the building users becomes important (Figure 8).

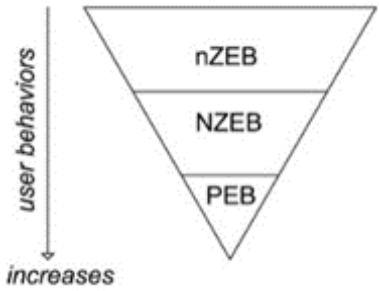


Figure 8. User behaviours impact towards positive buildings

Positive energy buildings are expected to differ more significantly in technical, legal, policy and user behaviours than in NZEBs. This highlights the priority of 'individual' buildings to achieve significant energy gains and the importance of expanding the system boundaries of energy analysis (Cole and Fedoruk, 2015). Table 1 shows these differences.

Table 1. Comparison of basic features of NZEB and PEB models (Cole ve Fedoruk, 2015).

NZEB model	PEB model
A bidirectional exchange of energy between a single building and the network	A more complex set of exchanges and energy partnerships
A one-year period of balance between demand and energy generation	A time span of an entire life cycle
Power generation is based on individual buildings for export	Energy performance is maximized in a system-based approach.

Although the NZEB design pattern has now become part of the regulatory system of European countries thanks to Directive 2010/31/EU, the PEB model is not yet known as a uniform at the European level (Magrini et al., 2020). Some of the decisive reasons why the PEB model has not yet found wide and concrete application are the regulatory, economic, social, and technological barriers that complicate the deployment of smart grids for energy sharing (Good et al., 2017).

MEMBER COUNTRIES EXCEEDING EU nZEB TARGETS

The Netherlands

In the Netherlands, the first low-energy house was built in 1982-1983. In 1996 he started 'Trias Energica', a research model for energy efficiency before using renewable energy. Trias Energetica represents a three-stage priority strategy (Mlecnik, 2012):

1. Reducing demand,
2. To use renewable energy sources and
3. Solving the remaining demand efficiently and cleanly.

Energy performance standards in the Netherlands are based on the Energy Performance Coefficient (EPC), a dimensionless number used as an indicator of the building's energy performance based on how the building is used (Groezinger et al., 2014). The following steps were taken prior to the EPC:

- 1978-1988 National Insulation Program (Van Eck, 2013),
  - 1.5 million existing homes (30% stock)
  - Thermal insulation requirements in building code for new buildings
- 1990-1994 EP determination methods (Dutch standards)
  - 3-5 Years Update, new technology

The energy coefficient of performance (EPC) standard is a minimum requirement for new buildings, first introduced in 1995 and gradually transitioning to nearly zero energy buildings in 2020. In Figure 9, with EPC, the energy demand of new buildings has been reduced to almost zero in 25 years (CE Delft, 2020).

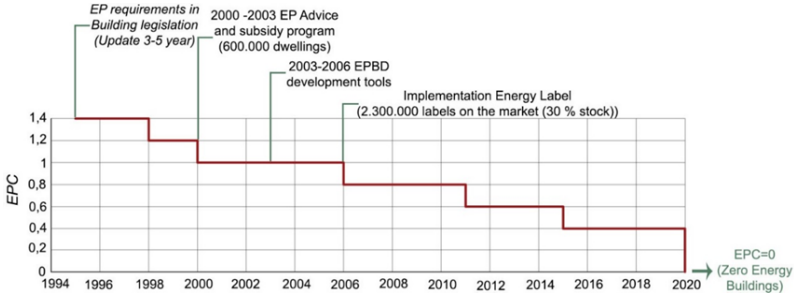


Figure 9. Development of EPC for new buildings in the Netherlands (Agentschap NL, 2012; Van Eck, 2013).

For residential buildings, an energy performance coefficient of 0.4 means approximately 50-65 kWh/m²y. Currently primary energy is 25 kWh/m²y in residences; it is 25-120 kWh/m²y in non-residential buildings (van Eck, 2018). A zero-energy building should have EPC = 0. As EPC requirements become more stringent, the percentage of renewable energy will become more important to meet the requirements (Groezinger et al., 2014). The Dutch government's national goals are to achieve an energy-neutral building stock by 2050. However, according to the scenario studies, shows that a near-zero energy demand in 2050 can only be achieved with very ambitious renewal measures, given future population, regeneration measures and temperature changes. To reach the target of reducing energy demand by 50% compared to 1990 by 2030, the annual replacement rate will need to be at least doubled from the current value (3%) (Olonscheck et al., 2015).

Germany

In Germany, the minimum energy performance laws that started with the Thermal Insulation Regulation (Galvin, 2014) continue with the EnEV revisions (Ascione et al., 2016). Germany is currently focusing on 'KfW efficiency houses' financed under the label KfW Efficiency House 40, 55 and 70 (ECOFYS, 2014). KfW standards “Kreditanstalt für Wiederaufbau” (KfW) is a state-owned bank for reconstruction and development and provides subsidies for buildings to be newly built or renovated to exceed the standard (Schimschar et al., 2011). The KfW standards are set by the standards outlined in EnEv and are largely compatible with anticipated future iterations of EnEv (Hawkey and Zeniewski, 2017). A diagram of Germany's progress towards neutral buildings is given in Figure 10.

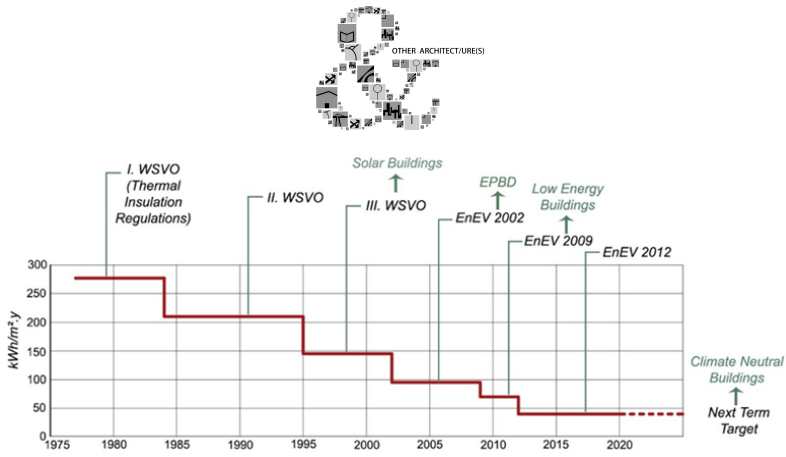


Figure 10. Minimum energy performance standards for new buildings in Germany (Galvin, 2014; Schüring, 2014; BMWi, 2015; Schlomann and Rohde, 2016).

Federal Government buildings in Germany are currently designed more efficiently according to legal requirements (Ascione et al., 2016). In Germany, with an energy demand of 14.7 kWh/m²y realized in 2018, NEWTONPROJEKT residences are seen as a great model for the future of the country's PEB construction. The building was designed and planned to meet the German “KfW Effizienzhaus 40 Plus” standard, which states that a building should have 40% lower primary energy demand and 55% less heat loss compared to a building that meets the minimum requirements (Jaeger et al., 2020). KfW provides an important market for low-energy buildings and passive houses in Germany. Studies have shown that KfW programs provide significant support for future building code requirements and reduce greenhouse gas emissions in the construction industry (Schimschar et al., 2011).

Denmark

In Denmark, the 1961 building code concerned the thermal insulation of the building envelope (roof, exterior walls, floor slabs, windows, and doors). Other requirements were included for the first time in the Danish building code in the late 1970s. The energy performance of the building was introduced as an option in 1995 (Danish Energy Agency's, 2015). An energy performance certificate (EPC) was introduced in Denmark in 1997 (Jensen et al., 2016). By 2006 it was mandatory to calculate the overall demand for primary energy in all new buildings (Danish Energy Agency's, 2015). Figure 11 presents the Danish building energy performance framework from 1961 to the present.

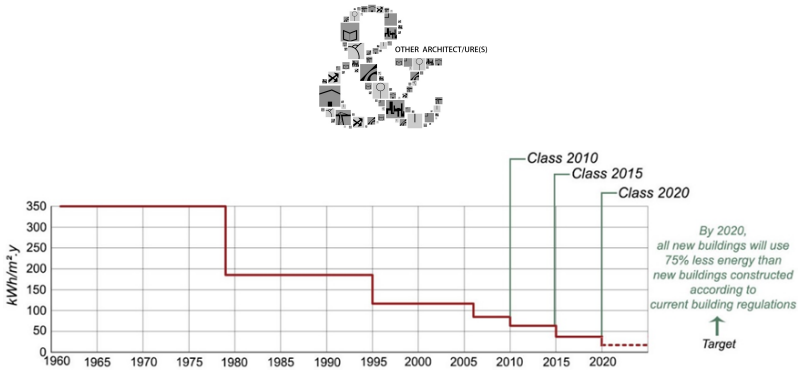


Figure 11. Minimum energy performance standards for new buildings in Denmark (BPIE, 2015; Danish Energy Agency's, 2015; Janssen, 2011).

Danish minimum requirements are defined as Class 2010, Class 2015, and Class 2020 (Table 2). These represent future minimum requirements (Danish Energy Agency's, 2015). Class 2020 is valid for public buildings until the end of 2018 and for all other buildings until the end of 2020 (Grözinger et al., 2014).

Table 2. Requirements for "class 2015" and "class 2020" buildings (Danish Energy Agency's, 2015).

	Mandatory 2010	**Class 2015**	**Class 2020**
Maximum energy demand/year (residential) HFS is the building's heated floor space in m²	52.5 kWh/m² +1650 kWh/HFS	30 kWh/m² +1000 kWh/HFS	20 kWh/m²
Ditto (non-residential)[1]	71.3 kWh/m² +1650 kWh/HFS	41 kWh/m² +1000 kWh/HFS	25 kwh/m²
Max. Air leakage/second (test pressure 50 Pa)	1.5 l/m²	1.0 l/m²	0.5 l/m²
Max. Design transmission loss[2], single-storey	5 W/m²	4 W/m²	3.7 W/m²
Min. Energy gain[3] through Windows/glazed walls	-33 KWh/m²year	-17 kWh/m²year	0 kWh/m²year

[1] Includes lighting request. [2] Average heat loss of 1m² from non-transparent parts of the building envelope, at 20˚C indoor temperature and -12˚C outside temperature. [3]Solar heat gain minus heat loss from 1 m² window (southeast facing) in a standard Danish winter.

France

In France, the first thermal insulation regulation came into force in 1975 (French Environment and Energy Management Agency, 2010). Thermal insulation regulations in 2000 and 2005 defined the performance levels that must be achieved for the consumption of new buildings (Lenoir et al., 2010). "Low Energy Buildings" in 2012 (French Environment and Energy Management Agency, 2010); In 2020, "Positive Energy Buildings" (French Environment and Energy Management Agency, 2010; Lenoir et al., 2010) are targeted. Only in French legislation there is a definition for PEB (EXCESS, 2020). Accordingly, buildings with high environmental performance (Rotger-Griful et al., 2017):

1. Maximum GHG emissions,
2. Minimum construction waste utilization (recycling),
3. Carbon life cycle analysis,
4. Building quality materials and ventilation system and
5. The minimum amount of bio-based material must comply with the requirements.

By 2050, it is targets to achieve an energy performance level in line with "low energy building" standards across the entire building stock (INECP, 2020). France implements central policies and benchmarks for primary energy use for residential and commercial buildings (Mata et al., 2020). As seen in Figure 12, France has, since 1975, limited the amount of energy a new building is allowed to consume with the Thermal Insulation Regulation (RT) (French Environment and Energy Management Agency, 2010).

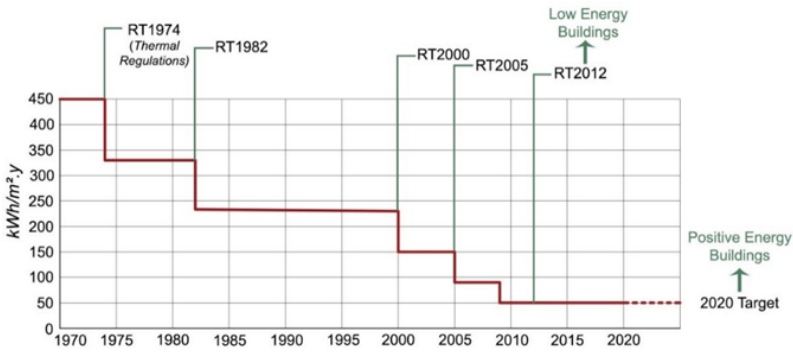


Figure 12. Minimum energy performance standards for new buildings in France (French Environment and Energy Management Agency, 2010; Lenoir et al., 2010; INECP, 2020).

EXISTING SITUATION AND PROPOSAL ROADMAP IN TURKEY

Existing situation

There is no concrete work yet for the implementation of nZEB, NZEB and Positive Buildings in Turkey. However, there are 2030 and post-2030 targets such as raising awareness for the transition to nZEB buildings and transition to zero energy buildings (NZEB) (MEU, 2021). In Turkey, a path is followed so that the legal framework is compatible with EU Directives (BPIE, 2019). Important Legal Arrangements:

- Energy Efficiency Law (2007)
- Energy Performance of Buildings Regulation (2008)
- Energy Efficiency Regulation (2011)
- Energy Efficiency Strategy (2012)
- TS 825 (2008, and the draft version of the revision of the same document dated 2013).
- National Energy Efficiency Action Plan (2017)
- Buildings' Energy Performance Regulation (2017)
- Green Buildings Regulation (2017)

Proposal Roadmap

National plans should be developed that include key objectives that reflect national, regional, or local conditions, and interim targets, policies and financial or other measures that facilitate their realization. For this, the following must be done first:

- Creating a guide. The guidelines should cover architectural design issues as well as energy systems.
- Stakeholders (construction industry, equipment manufacturers, academia, NGOs, national government bodies and municipalities) must be acted upon.
- Financial incentives can take the form of subsidies for energy efficiency investments.
- Awareness-raising studies focusing on raising awareness about energy saving should be carried out.
- Studies should consider relevant impact factors and trends, including climate changes, thermal regeneration measures and population changes.
- Appropriate education and training (particularly to ensure that energy efficiency becomes a compulsory subject in the training of architects, engineers, and craftsmen).

Moreover, besides efficiency, technical improvements and renewable generation, behavioural measures are only reflected in the use of information and communication technologies, with minimal focus on lifecycle perspectives (Mata et al., 2020). However, the performance of

PEBs will be successful if they are carried out in an integrated manner with the solution of both technical and behavioural problems.

EVALUATION

Climate

To achieve a NZEB goal, building systems and design strategies must be integrated and optimized according to local climatic conditions (Feng et al., 2019). Netherlands, Germany, and France Oceanic climate (4th climate zone); Denmark is in the Cold climate (5 climate zone) region (Figure 13).

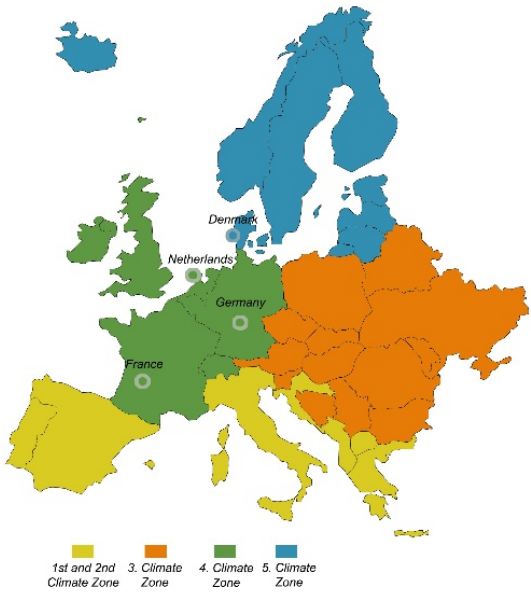


Figure 13. European climate zones (Kurnitski et al., 2014).

Goals

European Union member countries have set targets for energy efficiency, reducing greenhouse gas emissions, and increasing the use of renewable energy in their national action plans. Along with these targets, the EPBD was revised again in 2018, and it became mandatory to take some measures to reach the energy and climate targets for 2030 (EU Commission, 2018). In Table 3, the targets taken for the neutrality of the countries surveyed for 2050 are given.

Table 3. Countries' integrated national energy and climate plans targets (INECP, 2019a; INECP, 2019b; INECP, 2019c; INECP, 2020; Deloitte, 2014; MENR, 2012; Danish Energy Agency, 2015).

	Primary energy consumption (decrease) rate (%)			**GHG reduction rate (%)**			**Renewable energy rate (%)**		
	2020	2030	2050	2020	2030	2050	2020	2030	2050
EU-28	20	32,5	50	20	40	80-95	20	32	Climate neutral
Germany	20	32,5 **	50 **	40	55 (min)	80-95 (Nötr)	18	30	80 min
Denmark	14,5 (2006 level)	40		32	70	net zero emission	30	55	100 Climate neutral
France		40 ***	50	10 (2010 level)	40	Carbon neutral	23	33 ***	
Netherlands	22,7	24,9	50	25	49	95	14	30-32	
Turkey	20*			21			31		

* It covers only public buildings. ** 2008 level ***2012 level

The Council of Europe does not define a common definition, approach for NZEB and PEB and does not clearly define the categories of implementation and evaluation. Therefore, these countries have defined buildings according to the requirements and methodologies appropriate to them (Table 4). Different definitions cause design diversity and discrimination. This is due to differences in climate, renewable energy source, building function (residential, non-residential) and technologies (Elnagar & Köhler, B, 2020). These definitions require a clear and consistent definition and a commonly accepted energy calculation methodology before they are fully implemented in national building codes and international standards (Marszal et al., 2011).

Table 4. Comparison of examined member countries according to different factors (BPIE, 2015; van Eck, H. 2018; INECP, 2019b; Grözinger et al., 2014; Garcia and Kranzl, 2018; Danish Energy Agency, 2015).

Factors			Germany	Netherlands	Denmark	France
Climate zone			4	4	5	4
nZEB definition	EPBD scope		✓ [1]	✓	✓ [2]	✓
	New buildings		Under development	✓	✓	✓ [3]
	Existing buildings		Under development	No data	✓	✓
	Numeric display		Under development	✓	✓	✓
	Other display		EP	EP	EP, OH, TS	EP, OH, TS
Official transition to nZEBs	Public		1.01.2019	1.01.2019	1.01.2019	28.10.2011
	Non-public		1.01.2021	1.01.2021	1.01.2021	1.01.2013
Max Primary energy [kWh/m²y]	New building	Public	40 (%40 PE [3])	Included in the calculation; building needs to comply with energy performance coefficient = 0	20	40-65 [4, 5]
		Non-public			25	70-110 [4,5]
	Existing building	Public	55-70 (%40 PE [3])		20	80 [5]
		Non-public			25	%60 PE [4]
Type of energy used			Heating, cooling, hot water, ventilation, lighting	Heating, ventilation, hot water, auxiliary systems	Heating, cooling, ventilation, domestic hot water (and lighting for non-residential buildings)	Heating, cooling, hot water, lighting, auxiliary systems
Renewable energy rate (%)			15-60	50	44-51 (Class 2015) 51-56 (Class 2020)	No data [1]

(✓: Definition in an official document; EP:Envelope performance; OH:Overheat indicator; TS:Performance of technical systems; [1] No cooling for residential buildings; [2] The energy consumption of devices has been added to the description (for both residential and non-residential buildings); [3] Buildings in compliance with the 2012 Thermal Regulation are defined as buildings with near-zero energy consumption, but it is anticipated that buildings will be positive buildings from 2020; [4] Depending on the reference building; [5] Depending on location; [1] Contribution of renewable energy to building EPC consumption equal to or more than 5kwhep/(m².year)).

National calculation methods differ from country to country. The minimum requirements specified in the national building regulations of the countries studied are not the same. In addition, calculation methods in the building code of minimum requirements do not always include the same energy flows (Janssen, 2011). This situation causes differences in the policies of the countries towards the implementation of the targets (Table 5).

Table 5. Examples of policies for implementation of targets (Jensen et al., 2009).

Country/Year	2009	2010	2012	2015	2020
Denmark		-25%[1]		-50%[1]	-75%[1]
France			LEB[2]		E plus
Germany	-30%		-30%[3]		NFFB
Netherlands		-25%		-50%	ENB

LEB: Low Energy Buildings. E plus: Energy positive buildings. NFFB: Buildings to operate without fossil fuels. ENB: Energy Neutral Buildings. [1] Percentage of the 2006 minimum level, [2] Effinergie standard, [3] Percentage of the 2009 minimum level.

To decarbonize the energy use of buildings, almost all existing buildings must be renewed by 2050 within the framework of energy efficiency. According to the modelling, any delay in reaching 2.5% of annual retrofits by 2030 will make it nearly impossible to retrofit most buildings by 2050. This shows that the heating, cooling energy demands, and electricity demand of the house will increase by at least 25%, 20% and 20%, respectively (Figure 14).

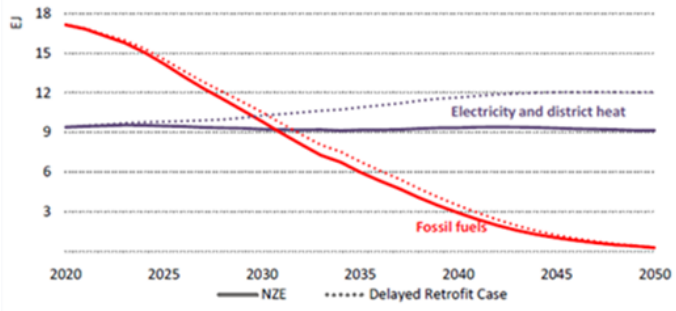


Figure 14. Global residential heating and cooling energy demand scenario with net zero emissions and delayed retrofit case (IEA, 2021).

Policies to promote building efficiency improvement should be implemented to help member countries achieve net zero/carbon neutral targets. There are many EU-funded projects and programs for the dissemination of the PEB model such as “Horizon 2020” (Magrini et al., 2020). One of the most important programs is the Positive Energy Zones (PED) Program (Figure 15). With this program, the buildings will be positive, and Turkey is within the scope of this program.

Figure 15. Countries involved in the Positive Energy Districts (PED) Programme (JPI Urban Europe).

CONCLUSION

In this study, the countries of the Netherlands, Germany, Denmark and France, which exceed the EU's EPBD nZEB targets, are discussed. While these countries focus on a common solution for 2050 neutral buildings by targeting energy efficient buildings, they each act with a different policy approach. According to the results of the analysis, the best countries in numerical data such as maximum primary energy consumption are the Netherlands and Denmark (20 kWh/m²y). However, France (public-2011; non-public 2013) was the earliest to transpose the nZEB targets into their legislation. In addition, although the future targets of the Netherlands, Germany and Denmark have not been transferred to their legal regulations yet, the transition to PEBs in France is included in the legal regulations. In addition, although the definition of nZEB is not yet included in Germany's legal regulations, it is taking firm steps towards its climate neutral target with the Energy Savings Regulation and the KfW Efficiency House.

This shows that all four countries can reach the net zero target for new buildings before 2050 according to current policies. construction of the first low-energy house in the Netherlands in 1982-1983 (Mlecnik, 2012); Completion of Germany's first net zero energy building in 2013 (Ascione et al., 2016); the fact that the term zero-energy building was defined in Denmark in 1976 (Torben, 1977); The construction of the first positive energy building in France in 2007 (Lenoir et al., 2010) proves this situation. However, in existing buildings, it shows that the current targets can only be achieved by taking additional measures. In Turkey, NZEB and PEB design has not started to be implemented, as these building designs and legal regulations have not been completed yet. Considering the climate diversity in Turkey, it is inevitable to develop different design strategies for these buildings. Thus, climate-sensitive design and application features,

technology options will increase the positive environmental effects necessary for human health and comfort, and the energy consumption of buildings will be minimized.

Finally, energy efficiency and sustainable construction hold significant market potential. Because the renewable energy sector alone is expected to employ 2 million people by 2020 and most of this new employment is expected to be created in the energy sector. Therefore, increasing the level of education, specialization, and skills of personnel in the field of energy efficiency should be initiated (Magrini et al., 2020). Also, more work is needed to combine current climate targets with realistic, actionable policies to make carbon savings a reality for different contexts and stakeholders around the world. Once this is achieved, the market for buildings with high energy performance will increase significantly in the future and such buildings will soon become the standard.

REFERENCES

Agentschap, N. (2012). Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. Monitor energiebesparing gebouwde omgeving 2012.

Attia, S. (2016). Towards regenerative and positive impact architecture: A comparisonof two net zero energy buildings. Sustainable Cities and Society, 393–406.

Attia, S. (2020). Spatial and Behavioral Thermal Adaptation in Net Zero Energy Buildings: An Exploratory Investigation. Sustainability.

Attia, S., Gratia, E., De Herde, A., & Hensen, J. (2012). Simulation-based decision support tool for early stages of zero-energy building design. Energy and Buildings, 49, 2–15.

Birgisdóttir, H., & Madsen, S. S. (2017). Bygningers indlejrede energi og miljøpåvirkninger [Buildings embodied energy and environmental impacts]. Aalborg: Politeknisk Boghandel og Forlag ApS.

BMWi. (2015). Energy Efficiency Strategy for Buildings The 2050 Building Scenario-Methods for achieving a virtually climate-neutral building stock. Federal Ministry for Economic Affairs and Energy.

BPIE. (2015). Nearly Zero Energy Buildings Definitions Across Europe, nZEB definitions. Buildings Performance Institute Europe.

BPIE. (2019). Enhancing Turkey's policy framework for energy efficiency of buildings, and recommendations for the way forward based on international experiences. SHURA Energy Transition Center Buildings Performance Institute Europe.

CE Delft. (2020). Zero carbon buildings 2050 Background report. Publication code: 20.190376.087, www.cedelft.eu.

Cole, R., & Fedoruk, L. (2015). Shifting from net-zero to net-positive energy buildings. Building Research and Information, 43;1, 111-120.

MEU. (2021). Building Industry Energy Efficiency Technology Atlas. Ankara: Ministry of Environment and Urbanization.

Danish Energy Agency. (2015). Energy and Climate Policies beyond 2020 in Europe - Overall and selected countries.

Danish Energy Agency's. (2015). Energy Policy Toolkit on Energy Efficiency in New Buildings Experiences from Denmark. Danish Energy Agency's Global Assistance, www.ens.dk/en/Global-assistance.

Deloitte. (2014). Turkey National Renewable Energy Action Plan.

Economidou, M., Todeschi, V., Bertoldi, P., D'Agostino, D., Zangheri, P., & Castellazzi, L. (2020). Review of 50 years of EU energy efficiency policies for buildings, Energy and Buildings.

Elnagar, E., & Köhler, B. (2020). Reduction of the Energy Demand With Passive Approaches in Multifamily Nearly Zero-Energy Buildings Under Different Climate Conditions. Frontiers in Energy Research,8, 545272.

MENR. (2012). National Energy Efficiency Strategy Document. Republic of Turkey Ministry of Energy and Natural Resources.T.R. Official newspaper, 28215, 20.2.2012.

EU Commission. (2002). Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings. Official Journal of the European Union.

EU Commission. (2010). Directive 2010/31/EU of the European Parliament and of Council of 19 May 2010 on the energy performance of buildings (recast). Official Journal of the European Union.

EU Commission. (2018). Directive (EU) 2018/844 of the European Parliament And Of The Council of 30 May 2018 on the energy performance of buildings. . Official Journal of the European Union.

EU Commission. (2020). In focus: Energy efficiency in buildings. www.ec.europa.eu.

EXCESS. (2020). FleXible user-CEntric Energy positive houses, deliverable 1.1: PEB as enabler for consumer centred clean energy transition: shared definition and concept.

Feng, W., Zhang, Q., Ji, H., Wang, R., Zhou, N., Ye, Q., & Hao, B. (2019). A review of net zero energy buildings in hot and humid climates: Experience learned from 34 case study buildings. Renewable and Sustainable Energy Reviews, 114, 109303.

Feng, W., Zhang, Q., Ji, H., Wang, R., Zhou, N., Ye, Q., Yu Lau, S. (2019). A review of net zero energy buildings in hot and humid climates: Experience learned from 34 case study buildings. Renewable and Sustainable Energy Reviews, 114, 109303.

French Environment & Energy Management Agency. (2010). French know-how in the field of energy efficiency in buildings. PEFC, 10, 31, 1605.

Galvin, R. (2014). Why German homeowners are reluctant to retrofit. Building Research & Information, 42, 4, 398–408.

Garcia, J., & Kranzl, L. (2018). Ambition Levels of Nearly Zero Energy Buildings (nZEB) Definitions: An Approach for Cross-Country Comparison. Buildings, 8, 143.

Groezinger, J., Boermans, T., John, A., Seehusen, J., & Wehringer, F. (2014). Overview of Member States information on NZEBs, Working version of the progress report - final report. ECOFYS.

Hawkey, D., & Zeniewski, P. (2017). Case study: Climate Neutral building stock in Germany. Energy and Society.

Hu, M., & Qiu, Y. (2019). A comparison of building energy codes and policies in the USA, Germany, and China: progress toward the net-zero building goal in three countries. Clean Technologies and Environmental Policy, 21, 291–305.

IEA. (2021). Net Zero by 2050 A Roadmap for the Global Energy Sector. International Energy Agency.

INECP. (2019a). Netherland's Integrated National Energy and Climate Plan 2021-2030. Ministry of Economic Affairs and Climate Policy.

INECP. (2019b). Germany's Draft Integrated National Energy and Climate Plan . UBA-Klimaschutzszenario, www.umweltbundesamt.de.

INECP. (2019c). Denmark's Integrated National Energy and Climate Plan under the 'Regulatıon Of The European Parlıament And Of The Councıl' on the Governance of the Energy Union and Climate Action. Danish Ministry of Climate, Energy and Utilities.

INECP. (2020). Integrated National Energy And Climate Plan for France.

Janssen, R. (2011). Nearly Zero Energy Buildings: Achieving the EU 2020 Target. Sustainable Energy Week.

Jensen, O. M., Wittchen, K., Thomsen, K., Dyrbøl, S., Albæk, T., Eriksen, K., Delpino, E. (2009). Towards very low energy buildings: Energy saving and CO2 emission reduction by changing European building regulations to very low energy standards. SBI forlag.

Jensen, O., Hansen, A., & Kragh, J. (2016). Market response to the public display of energy performance rating at property sales. Energy Policy, 93, 229–235.

JPI Urban Europe. Positive energy districts (PED). https://jpiurbaneurope.eu/ped/.

Kalluri, B., Seshadri, B., Gwerder, M., & Schlueter, A. (2020). A longitudinal analysis of energy consumption data from a high-performance building in the tropics. Energy & Buildings, 224, 110230.

Klobut, K., Mäkeläinen, T., Huovila, A., Hyvärinen, J., & Shemeikka, J. (2016). KPI framework for energy efficient buildings and neighbourhoods. ECPPM 2016 11th European Conference on Product and Process Modelling: eWork and eBusiness in Architecture. Limassol, Cyprus: Engineering and ConstructionAt. 309–314.

Kolokotsa, D., Rovas, D., Kosmatopoulos, E., & Kalaitzakis, K. (2011). A roadmap towards intelligent net zero- and positive-energy buildings. Solar Energy, 85, 3067–3084.

Kurnitski, J., Buso, T., Corgnati, S. P., Derjanecz, A., & Litiu, A. (2014). nZEB definitions in Europe. REHVA Journal.

Magrini, A., Lentini, G., Cuman, S., Bodrato, A., & Marenco, L. (2020). From nearly zero energy buildings (NZEB) to positive energy buildings (PEB): The next challenge - The most recent European trends with some notes on the energy analysis of a forerunner PEB example. Developments in the Built Environment, 3, 100019.

Marszal, A., Heiselberg, P., Bourrelle, J., Musall, E., Voss, K., Sartori, I., & Napolitano, A. (2011). Zero Energy Building – A review of definitions and calculation methodologies. Energy and Buildings, 43, 971-979.

Marszal, A. J., & Heiselberg, P. (2009). Zero Energy Building (ZEB) definitions–Aliterature review, DCE Technical reports No: 78. Aalborg University-Department of Civil Engineering.

Mehrjerdia, H., Iqbala, A., Rakhshanib, E., & Torres, J. (2019). Daily-seasonal operation in net-zero energy building powered by hybrid renewable energies and hydrogen storage systems. Energy Conversion and Management, 201, 112156.

Mlecnik, E. (2012). Defining nearly zero-energy housing in Belgium and the Netherlands. Energy Efficiency , 5, 411–431.

Monti, A., Dirk, P., Ellis, K. A., & Mancarella, P. (2017). Energy Positive Neighborhoods and Smart Energy Districts. Elsevier.

Rotger-Griful, S., Welling, U., & Jacobsen, R. H. (2017). Implementation of a building energy management system for residential demand response. Microprocessors and Microsystems, 55, 100–110.

Sartori, I., Napolitano, A., & Voss, K. (2012). Net zero energy buildings: A consistent definition framework. Energy Build, 48, 220–232,.

Schimschar, S., Blok, K., Boermans, T., & Hermelink, A. (2011). Germany's path towards nearly zero-energy buildings—Enabling the greenhouse gas mitigation potential in the building stock. Energy Policy, 39, 3346–3360.

Schlomann, B., & Rohde, C. (2016). Energy Efficiency Policies in the German Energy Transition. Fraunhofer Institute for Systems and Innovation Research ISI, Karlsruhe, Germany.

Schüring, A. (2014). German Strategy for Energy-Efficient-Buildings & CO2 Rehabilitation Programme. Federal Ministry for Economic Affairs and Energy.

Scognamiglio, A. a. (2014). Photovoltaics' architectural and landscape design options for Net Zero Energy Buildings, towards Net Zero Energy Communities: spatial features and outdoor thermal comfort related considerations. 29th EU PVSEC, 24, 477–495.

Torben, V. (1977). Dimensioning of the solar heating system in the zero energy house in Denmark. Solar Energy, 19, 195–199.

Torcellini, P., & Crawley, D. B. (2006). Understanding zero-energy buildings. ASHRAE Journal, 48, 9. 62–69.

Torcellini, P., Pless, S., Deru, M., & Crawley, D. (2006). Zero Energy Buildings: A Critical Look at the Definition. Preprint.

Van Der Grijp, N., Van Der Woerd, F., Gaiddon, B., Hummelshøj, R., Larsson, M., Osunmuyiwa, O., & Rooth, R. (2019). Demonstration projects of Nearly Zero Energy Buildings: Lessons from enduser experiences in Amsterdam, Helsingborg, and Lyon. Energy Research & Social Science, 10-15.

Van Eck, H. (2013). National Plan Towards nearly zeroenergy buildings in The Netherlands. Agentschap NL Ministerie van Economische Zaken.

Van Eck, H. (2018). EPBD Implementation in The Netherlands Status in December 2016. www.rvo.nl.

Wurtz, F., & Delinchant, B. (2017). Smart buildings" integrated in "smart grids": A key challenge for the energy transition by using physical models and optimization with a "human-in-the-loop" approach. Comptes Rendus Physique, 18, 428–444.

Zeiler, W., Gvozdenović, K., De Bont, K., & Maassen, W. (2016). Toward cost-effective nearly zero energy buildings: The Dutch Situation. Science and Technology for the Built Environment, 22, 7, 911-927.

URL 1. https://positive-energy-buildings.eu/. 20.08.2021.

THE EVALUATION OF ENVIRONMENTAL SUSTAINABILITY IN THE CONTEXT OF OPERATIONAL AND EMBODIED ENERGY ON EXTERIOR WALL, EXAMPLES OF HOTEL BUILDINGS FROM ISTANBUL

Ezgi YILDIRIM[1], Fatih YAZICIOĞLU[2]

[1]Istanbul Technical University, Turkey
ezgiyldrm91@gmail.com,
[2]Istanbul Technical University, Turkey
yaziciogluf@itu.edu.tr

ABSTRACT

The initial issue considered in this paper is exterior walls which are a large part of the building envelope and the most exposed to atmospheric conditions of the buildings, fulfilling various performance requirements. Rapidly increasing energy demand and consumption, and consequently occurring greenhouse emissions bring about many environmental damages as population and technology grow in today's world. In this case, energy efficiency, sustainable architecture, and environmental sustainability principles should take into account the buildings that consume much energy. Therefore, evaluating exterior walls of five hotel buildings in İstanbul as environmental sustainability in the context of operational and embodied energy in addition to emphasizing designers of today and researchers' attitudes towards these issues are aimed in this paper. The methodology of the study comprises a literature review and a case study. In the case study, U-value (thermal transmittance), the annual heating energy, and operational carbon dioxide related to this energy and the embodied carbon dioxide amounts of these exterior walls are calculated using exterior walls' details, standard, and a previous study. As the results of calculation, the material, the system, and the operational and embodied carbon dioxide amounts of the exterior wall details are compared and contrasted. To conclude, while evaluated exterior walls of hotels have high performances regarding operational energy, causing negative impacts in terms of embodied energy. Therefore, there is a need for legal requirements on sustainability and the environment including embodied carbon and energy in Turkey and the world.

Key Words: Exterior Walls; Performance of Exterior Walls; Environmental Sustainability; Operational Energy; Embodied Energy.

INTRODUCTION

There is an organic relationship that has begun to date back to The Stone Age with setting their environment in order between human and physical environment. The physical environment has been exposed to both natural disasters and changes from humans from the formation of the earth to today's world (Kuban, 2007). Several impacts of global climate change such as increasing numbers of glacial lakes, changes in many ecosystems, warming of lakes and rivers, time changing of animal migration on the natural and human environment have been observed. These impacts will bring out longer periods of drought, high flood risk, extinction of animals, regional changes in crop productivity, acceleration of sea level, and various health problems in humankind. According to observational evidence from all continents and most oceans, many natural systems are being affected by regional climate changes, particularly temperature rises. Much more evidence in the world within recent years shows that changes in many physical and biological systems are linked to anthropogenic (originating in human activity) warming (IPCC, 2007). Greenhouse gas emissions which have risen more in the atmosphere rapidly play an important role in this warming due to absorbing the Sun's energy. Greenhouse gases (carbon dioxide, methane, nitrous oxide, fluorinated gases) generally result from fossil fuel combustion, industrial processes, forestry, and other land use (IPCC, 2014). This situation causes a reduction of energy sources and a variety of environmental problems.

Changing greenhouse emissions levels is related to various drivers as well. The population of the world, which is one of the most important drivers of greenhouse emissions, is increasing. Additionally, technology in many fields, especially building technology, is developing day by day. Meanwhile, it is seen that there is a demand for a new shelter and a desire for quality and comfortable living. As a consequence, energy consumption and environmental damage are rapidly rising with these new developments. To meet these needs and desires, new buildings are designed and constructed in today's world. However, buildings in the European Union are responsible for 40% of energy consumption and 36% of greenhouse gas emissions, which mainly stem from construction, usage, renovation, and demolition. In addition, roughly 75% of the European Union building stock is energy inefficient which means that a large part of the energy used goes to waste (European Commission, 2020). Therefore, the issues of energy efficiency in buildings, sustainable architecture, and environmental sustainability play a significant role to provide more liveable, healthier places for future generations.

Environmental sustainability, one of the three types of sustainable development, is about meeting human needs without damaging the planet's capacity to support life and aims to protect the ecological basics such as sustainable management and use of ecosystems, natural resources, and equitable access of all development (United Nations, 2009, 2011). Environmental sustainability is not usually included as a multidimensional design input on the exterior walls which is the most exposed to atmospheric conditions of the buildings. Besides, exterior walls are one of the significant

elements affecting acoustic performance, mechanical resistance, protection from water and moisture, fire protection, sustainability especially thermal performance in buildings. Accordingly, with its thermal performance, they influence energy efficiency to a great extent.

When looking at the subject in terms of energy types in the context of environmental sustainability, some definitions are as follows. Operational energy (heating, ventilation and air conditioning, domestic hot water, lighting, and operating devices) defined as the energy use of the building-related technical systems during the use and operation of the building is impressed by the exterior walls (BS-EN 15643-1, 2010). On the other hand, the total energy required during the extraction, transportation, and production of building materials is the amount of embodied energy of the material. The consumption of this energy creates carbon dioxide (CO_2) and other greenhouse gases emissions. The amount of embodied carbon includes emissions from all extraction, transportation, and production processes that are required before materials are made ready at the factory. This assessment is defined as cradle to gate in the life cycle of the buildings. Lastly, the operational carbon amount includes CO_2 emission during the operating period of the building (European Commission, n.d.; Ayaz&Yang, 2010).

Being the settlement place of different civilizations throughout history, Istanbul's strengths such as culture, art, and geographical location creates opportunities for education, culture, congress, health, sports, nature, and plenty other types of tourism (T.C. Kültür ve Turizm Bakanlığı, n.d.) The development of tourism has increased the need for accommodation and new buildings have begun to be constructed for this purpose. The buildings constructed for accommodation from the caravanserais of history to today's hotels have functions such as providing the best service to their occupants with safety and providing an environment of high comfort and quality (Bektaş, 1999). New hotel buildings constructed in Istanbul should be designed by considering the highest comfort conditions of the occupants.

Considering these problems and explanations above, this study aims to evaluate the exterior wall of a big part of the building envelope regarding environmental sustainability criteria in line with operational and embodied energy, through examples of hotel buildings from Istanbul, to state the amount of operational and embodied (CO_2), and make suggestions for more sustainable solutions of buildings during the design phase of the building life cycle (Yıldırım, 2018). The objective of this paper is not only to present the point of view of designers in Turkey but also emphasizing today's designer's and researchers' attitudes towards these issues in the world.

The scope of this study is examined from different four aspects as geographic, building type, temporal, and building elements:

Turkey has maintained its importance in every age of history as a bridge between east and west. Anatolia has been the center of many civilizations throughout history. In this place, different states such as Rome, Byzantine, and Ottoman were established. The trade between Europe and Asia increased the geographical importance of Anatolia. İstanbul has provided

the trade throughout history owing to its position. This importance and gradually developing building stock in İstanbul effect on choosing hotels from various locations in this city for the case study.

Buildings have a broad perspective depending on several functions and principles which provide different points of view offering various materials, construction techniques, architectural and urban texture. Hotel buildings with comfort-oriented and high user requirements are evaluated in the study and are part of this perspective.

On the purpose of understanding the main idea easily for future generations and being beneficial to them, the temporal scope is defined as the buildings constructed after 2010 due to discussing the subject of the study (external walls, environmental sustainability) more in recent years with the development of technology.

Buildings consist of foundations, walls, floors, roofs, columns, beams, and stairs that form a building carrier system. External walls, which form a large part of the building envelope and meet various performance requirements, can significantly contribute to the reduction of energy consumption and the sustainability of the building. The exterior walls of the hotel samples are examined in terms of operational and embodied energy in this study.

The methodology of the study consists of the selection of keywords (exterior walls, performance of exterior walls, environmental sustainability, operational energy and embodied energy), book and national thesis center review, international articles/papers and specific books /articles/papers review related to the key words, hotel sample selection study, evaluation of the case study and improving suggestion as regards evaluation results.

Five hotel buildings in İstanbul are selected for the case study. Based on the information obtained from the architectural offices, exterior wall details of these buildings are reached and examined. Then, U-value (thermal transmittance), the annual heating energy and the resulting CO_2 amounts from this energy (operational carbon), and the embodied CO2 amounts of these exterior walls were calculated using the Turkish Thermal Insulation Standard (TS 825) and Inventory of Carbon&Energy (ICE) Study (TS 825, 2013; Sustainable Energy Research Team, 2011). In the evaluation stage, the exterior wall details in terms of material and the system and the operational and embodied CO_2 amounts of the exterior wall details are compared and contrasted to each other.

EXTERIOR WALLS

Building undertakes a system task within itself and on the purpose of maintaining its function, should provide interrelated and integrated subsystems. Building takes part in the hierarchical system from macrocosmos to microcosmos (Macrocosmos, world, country, city, city center, building complex, building, space, space/building element, building material, …, microcosmos). In this system of hierarchy, each stage is a sub-system of the upper system and upper system of the sub-system (Toydemir

et al, 2000). According to Ching and Adams (2008), a building consists of a structural system, building envelope and mechanical system. Floors, roofs, columns, beams carrying gravity and lateral loads are the structural system of the building. Building envelope includes the roof, exterior walls, windows and doors of the building. The mechanical system of the building comprises many services such as heating-cooling-air conditioning, electrical and plumbing system, lift, escalator, security equipment, fire system.

The exterior wall means a wall with at least one side facing the outside air or the ground (Hasol, 2010). When designing the exterior wall, the below factors should be (Brock, 2005).

1. Stopping: Exterior walls should stop water ingress, degradation from water ingress after the rain and snow, heated or cooled air passage, and migration of water vapor.
2. Controlling: They should control the heat and water vapor of the indoor environment.
3. Transferring structural loads: They should transfer lateral loads from wind and seismic events and gravity loads.
4. Accommodating differential movement: They transfer both their loads and fixing components loads to structure.
5. Providing the aesthetic face of the building: The visual effect of the exterior walls is quite important.

Exterior walls contain structure, insulations, and exterior and interior finishes. Materials occurring in these components are chosen as durability, function, aesthetic and cost (Brock, 2005; Yazıcıoğlu and Altun, 2006).

I. The structure of exterior wall: It may be constructed with masonry, framing, panel, or cast-in-place construction system.
II. Insulations: It may be used related to heat, water, moisture, etc.
III. Finishes: It is possible to use different materials depending on environmental conditions primarily.

Throughout history, the function, usage, and characteristics of the exterior walls have changed with major turning points and architectural development considerably. Especially after The Industrial Revolution, social and cultural changes have led to fundamental changes in architecture. The main factors identifying architecture can be summarized as changes in technology, building materials, issues, social structure. Upon these changes, the shape of buildings, materials, characteristics, and also exterior walls will constantly continue to develop (Gürsel, 1993 & Hasol, 1965). The developments of exterior walls have varied them. Due to understanding them and specifying design principles, many researchers/architects classified exterior walls of which shapes as structure (load-bearing, non-load bearing wall/curtain wall), construction types (masonry, monolithic, frame, sandwich wall), location (exterior, interior), layer factors (single layer, double layer, sandwich) (Foster,1996; Nashed, 1996; Türkçü, 2010). Nowadays, while masonry walls are preferred on low-rise buildings, curtain wall types have become more popular in so far as the construction of numerous high-rise buildings.

Exterior walls having various types contain several performance characteristics while meeting user requirements. When performance requirements for every building element are considered specific to exterior walls, thermal, acoustic, structural, fire protection, water and moisture protection, and sustainability (the characteristics of sustainable exterior walls performances may be discussed). This paper is focused on the thermal and sustainability performances of exterior walls. Thus, in the building design process, components of exterior walls should be selected from materials not causing hazardous emissions, having low embodied energy and low environmental effect on the manufacturing process, are recyclable materials. In addition to this, providing a high thermal performance of exterior wall systems, it is widely contributed to energy efficiency on the operation stage.

ENVIRONMENTAL SUSTAINABILITY AND EXTERIOR WALLS

Sustainable environmental development in order words environmental sustainability requires the use of renewable sources commonly, energy conservation and storage, not using hazardous materials for human health and not causing environmental damage in manufacturing, less waste generation, not reusing waste, and thus creating a less negative impact on human health (Çetiner, 2017). To increase environmental sustainability, a building should balance and integrate three principles (sustainable design, the economy of sources, and life cycle design) as to the recycling and reuse of design, construction, operation, maintenance, and architectural sources. These principles generate a conceptual framework for sustainable architectural design. This framework aims to help to create solutions intended for problems for designers (Kim, 1998). Sustainable design principles are stated as following: low environmental impact (local, regional and global), durability, reuse, increasing renewable energy use, self-sheltered envelope, energy management under the user's control, design with climate, health, and sensitivity to the natural environment (Edwards, 1999).

To understand the decreasing consumption of energy resources in terms of the building is possible with the analysis of the energy use in the building life cycle. Energy is consumed at every lifecycle stage of a building or product, from raw material extraction to disposal. Consequently, much more waste is generated whereas waste from use and disposal can be reused. Besides, products can be reused after disposal and being recycled. These ways reduce the repetitive use of energy (Edwards, 1999). The construction and operation stages of the building life cycle require much more energy than the other stages. The drivers create both embodied energy and operational energy defined before causing excessive energy consumption. For this reason, it should be focused on the operational and embodied energy of buildings.

According to the explanations, the function of the building, its location, the importance of the exterior walls, its various performances are directly related to environmental sustainability, sustainable design principles, and

energy use, these issues cannot be ignored in today's world. In parallel, the evaluation of environmental sustainability in the context of operational and embodied energy in the exterior wall has become worth studying in this paper.

ATTITUDES IN THE WORLD

Iddon and Firth (2013) developed Building Information Modelling (BIM) to predict embodied and operational carbon for a detached house. The construction scenarios improving thermal performance and accordingly decreasing operational carbon caused to decrease embodied carbon. The study suggested that improved material selection in the design stage will be possible to achieve a universal and strong methodology on the purpose of calculating embodied carbon and decreasing life cycle embodied carbon emission.

Ibn-Mohammed et al. (2013) conducted a literature review on operational and embodied emissions in buildings. The relationship between embodied and operational emissions has been critically reviewed in accordance with the life cycle of buildings. It is aimed to highlight and demonstrate the increasing proportion of embedded emissions as a result of efforts to reduce operational emissions. The study also discussed the need for an urgent policy for neglected embedded emissions, current energy, and climate policies.

Zhang and Wang (2017) examined the carbon emission-related heating analysis of the building lifecycle for the situation in China, considering the temporal scope. It has been obtained that the use of coal boilers for heating causes the highest operating emissions, while the use of solar heat pumps causes the least emissions. Emissions of buildings built without energy-saving measures in 1980 showed the highest value in 15 years, and residential buildings that comply with the Chinese standard to create energy efficiency showed the lowest value in 50 years

Balouktsi et al. conducted a global survey amongst design professionals within 23 countries to investigate the level of awareness and acceptance of environmental performance assessment and Life Cycle Assessment (LCA: One of the methods of the evaluation of environmental sustainability) of buildings. According to survey results, it is seen that design professionals applied or familiar with operational greenhouse gas emissions and operational CO_2 renewable and non-renewable primary energy demands more in their daily work instead of embodied greenhouse gas emissions, embodied CO_2, and embodied energy. Besides, the lack of environmental regulations/political incentives, clients demand, and lack of information data are the top barriers to using LCA.

CASE STUDY

The aim and methodology of the case study

Upon the literature review mentioned above, the evaluation of environmental sustainability in the context of operational and embodied energy on exterior walls of hotel buildings in Istanbul is decided. These evaluations were achieved in consequence of the calculations of operational energy use, the amount of operational CO_2, and embodied energy of exterior walls. Firstly, the operational energy use is presented with the thermal performances of exterior walls. Energy loss and energy gain were seen. Then, it was determined whether exterior walls provided the required value or not. For the U value and annual heating energy (thermal performances' data) calculations, TS 825 was used. According to the standard, the threshold u-value for exterior walls in Istanbul is 0,57 $W/m^2.K$. Furthermore, assuming that the heating of the hotels is provided by natural gas and considering the energy provided by natural gas and the amount of CO_2 released to the atmosphere, the amount of CO_2 caused by the use of operational energy was calculated. Secondly, the environmental impacts of exterior walls were obtained by stating the amount of embodied CO_2, and evaluating the sustainability performance of exterior walls. The amounts of embodied CO_2 were calculated by adding the data of exterior walls' materials. Owing to not establishing their EPD by every building materials manufacturer yet, a comprehensive Inventory of Carbon & Energy-ICE study of Bath University is used in this paper. Lastly U-value, the amounts of embodied and operational CO_2 were compared. When the average building lifespan was accepted as 50 years, it was seen how much CO2 emissions will be caused by heating energy. These amounts were compared to the amounts of embodied CO_2 and interpreted.

The information of hotel examples

Istanbul has been a center of industry, commerce, culture and tourism since ancient times by virtue of its geographical location. Therefore, new hotel buildings have been constructed with the need for accommodation. In this study, the exterior walls of user's rooms from 5 hotel buildings from different regions in İstanbul were evaluated in detail with the help of methodology explained in the former section.

Wish More Hotel İstanbul

Project Information (A Yapı Mimarlık, e-mail communication, May 2, 2016) (Figure 1):
Location: Bayrampaşa/İstanbul, Architect: Studio Vertebra- Omurga Mimarlık, Contractor: A Yapı Mimarlık, Facade Engineering: CWG Consulting/Salih Sekban, Year: 2016

Figure 1. Wish More Hotel İstanbul (Yıldırım, 2016a; e-mail communication, May 2, 2016)

The following building designed in the construction site plan is triangular. The structural system of it is reinforced concrete. The opaque component of the building façade consists of different materials such as ceramic, composite, spandrel glass, and enameled painted panels. The U-value, the annual heating energy, and the amount of annual heating energy-related CO_2 of the exterior walls were calculated. Calculations respectively, 0,24 W/m^2.K, 39946,07 kWh, 0,835 kg CO_2e were obtained. The total and per m^2 embodied CO_2 of this hotel building having an external wall area of 2618 m^2 were 179172,06 and 68,44 kg CO_2e.

Divan İstanbul

Project Information (Akan Mimarlık, e-mail communication, September 25, 2016), (Figure 2):

Location: Şişli/İstanbul, Architect: The Office of Thierry W Despont, Akan Mimarlık, Contractor: Akton Yapı, Year: 2011

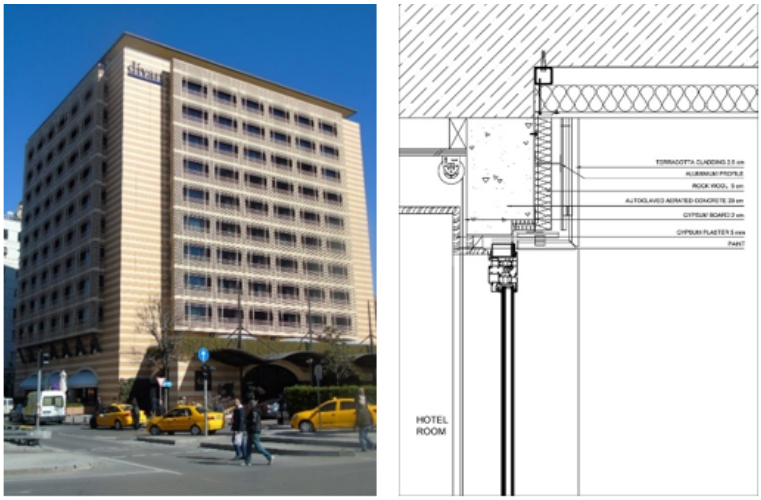


Figure 2. Divan İstanbul (Yıldırım, 2016b; Akan Mimarlık, e-mail communication, September 25, 2016).

The building has a square plan and open spaces around its four elevations. The structural system of it is reinforced concrete. Its opaque component consists of terracotta panels and insulated metal panels. There is also an aluminum sunshade system on the façade. The amounts of U-value, annual heating energy, and the annual heating energy-related CO_2 of the exterior wall were 0,27 W/m².K, 13381,27 kWh and 0,928 kg CO_2e. The total and per m2 embodied CO_2 of this hotel building having an external wall area of 789,07 m2 is 71983,68 and 91,22 kg CO_2e.

Hilton Garden Inn İstanbul Airport

Project Information (Metex Design, e-mail communication, March 7, 2016), (Figure 3):

Location: Bahçelievler/İstanbul, Architect: Metex Design Group, Contractor: Metex Design, Ar Tesisat Mühendislik Limited Şirketi, Işık Peyzaj Mimarlığı, Year: 2015.

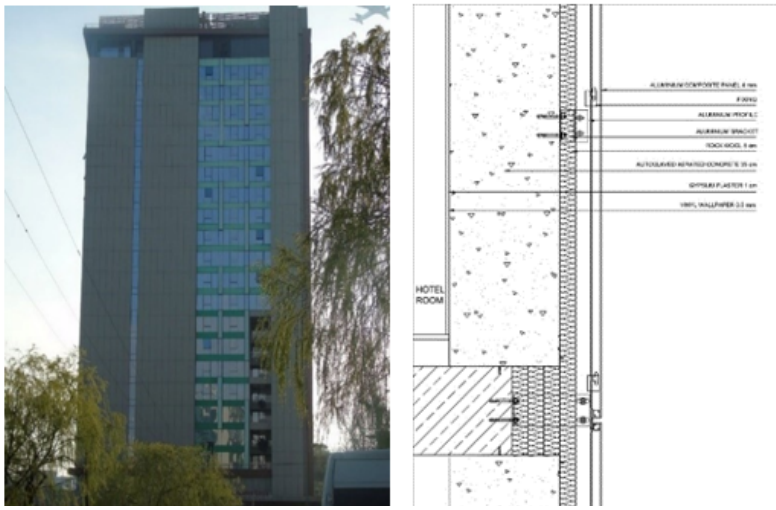


Figure 3. Hilton Garden Inn İstanbul Airport (Yıldırım, 2016c; Metex Design, e-mail communication, March 7, 2016).

The hotel is a rectangular building with a reinforced concrete structural system. The majority of the opaque component of the building façade consists of aluminum composite panels of different colors. The amounts of U-value, annual heating energy, and the annual heating energy-related CO_2 of the exterior wall were 0,30 W/m².K, 52301,81 kWh, and 1,043 kg CO_2e. The total and per m^2 of embodied carbon dioxide in the hotel building with an external wall area of 2742,22 m^2 were 226424,66 and 82,57 kg CO_2e.

Le Meridien İstanbul Etiler

Project Information (Emre Arolat Architects, e-mail communication, April 19, 2016; T.Sunaç, personal communication, May 10, 2018), (Figure 4).

Location: Beşiktaş/İstanbul, Architect: Emre Arolat Architects, Contractor: Makyol İnşaat, Can Bizet Mühendislik, Ersa Mühendislik, Aykar Mühendislik,, Aksoy Alüminyum, Facade Engineering: CWG Consulting/Salih Sekban, Year: 2012.

The building has a square plan, open spaces around its four elevations, and a reinforced concrete structural system. The opaque component of a building façade having a frame wall system consists of sandstone, granite, and compact laminate. The amounts of U-value, annual heating energy, and the annual heating energy-related CO2 of the exterior wall were 0,24 W/m².K, 40659,71 kWh, and 0,869 kg CO_2e. The total and per m^2 of embodied carbon dioxide in the hotel building with an external wall area of 2558,18 m^2 were 147948,08 and 57,83 kg CO_2e.

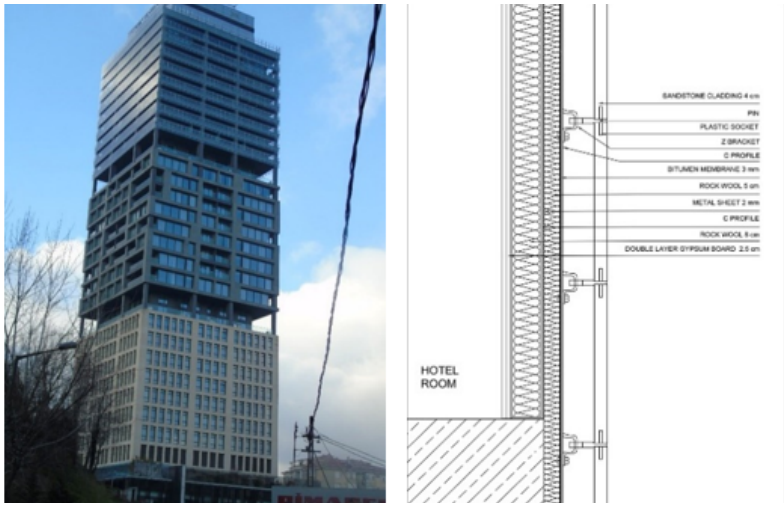


Figure 4. Le Meridien İstanbul Etiler (Yıldırım, 2016d; Emre Arolat Architects, e-mail communication, April 19, 2016).

Boutique Hotel in Pangalti

Project Information (Pangaltı'da Butik Otel, 2017), (Figure 5):

Location: Beyoğlu/İstanbul, Architect: Manço Architects, Contractor: Ciner Proje Yönetimi, Yapı Akademisi Espo Mühendislik, Arke Mühendislik, Erke Tasarım, Year: 2017.

Figure 5. Boutique Hotel in Pangalti (Manço Mimarlık, n.d.; Pangaltı'da Butik Otel, 2017).

The building, designed following the construction site plan, has open spaces around its three elevations. The structural system of it is reinforced concrete. The opaque component of a building façade having a frame wall system consists of expanded metal mesh, aluminium composite panel and paint. The amounts of U-value, annual heating energy, and the annual heating energy-related CO_2 of the exterior wall were 0,31 W/ m².K, 8476,21 kWh, and 1,065 kg CO_2e. The total and per m^2 of embodied carbon dioxide in the hotel building with an external wall area of 435,25 m2 were 33988,64 and 78,09 kg CO_2e.

Evaluation

As a result of the calculations, the values in Table 1 of 5 hotel buildings and some inferences based on these values are given below.

Hotels	U-value (W/ m².K)	The amount of CO_2 causing from annual heating energy (kg).	The amount of CO_2 causing from annual heating energy for 50 years (kg).	The amount of CO_2 for per sqm (kg)
Wish More Hotel İstanbul	0,24	0,835	41,75	68,44
Divan İstanbul	0,27	0,928	46,40	91,22
Hilton Garden Inn İstanbul Airport	0,30	1,043	52,15	82,57
Le Meridien İstanbul Etiler	0,24	0,869	43,45	57,83
Boutique Hotel in Pangalti	0,31	1,065	53,25	78,09

Table 1. The results of the calculations.

- Rock wool thermal insulation material is used in these 5 hotel buildings and it is seen that the U-values of all of them are lower than the 0,57 W/m²K. In this context, all the hotels meet the necessary legal requirements related to thermal performance. The reason for the differences in quantities is the thickness of the insulation layers.
- In the Boutique Hotel in Pangalti having the highest U-value, emissions from heating energy are calculated as 53,25 kg CO_2e per m2 when the building lifespan is accepted as 50 years. This value is 41,75 kg CO_2e for Wish More Hotel İstanbul having the lowest U-value. That is to say, high thermal performance reduces the value of emissions.
- Since the exterior walls of hotels have different details and materials having various densities and amounts, it is caused to obtain different values from embodied CO_2 calculations.

- The reason for having the most embodied equivalent CO_2 (91.22 kg CO_2e) of the Divan Istanbul Hotel is that a large part of the opaque component consists of insulated metal panels.
- Le Meridien Istanbul Etiler's inclusion of natural stone and wood-based coatings provides the least CO_2 (57.83 kg CO_2e) among other exterior walls. Likewise, the use of clay-based ceramic cladding on the large part of the opaque components of Wish More Hotel Istanbul (68.44 kg CO_2e) is the reason for the low amount of embodied CO_2.
- The high embodied CO_2 amount of Hilton Garden Inn İstanbul Airport and Boutique Hotel in Pangalti occurs from the use of aluminum composite and expanded metal mesh cladding in the exterior wall. The structural and fixing elements carrying the claddings of the exterior walls of the buildings are another factor that increases the amount of embodied CO_2 in them.
- In all hotel buildings, not only exterior claddings but also thermal insulation layers have a big share in the amount of embodied CO_2 per sqm. Although thermal performance is increased with the thermal insulation layer, CO_2 emission is increased.
- It is seen the large differences between embodied CO_2 and operational CO_2 regarding 50 years calculations. It can be stated that the CO_2 emission amount from the manufacturing of the hotel's exterior walls meets operational use-related heating from them in an average of 80 years.

CONCLUSION

Consequently, it is seen that whilst evaluating exterior walls of hotels that had a high performance as part of operational energy, causing negative impacts in terms of embodied energy. Even as designers consider the use of materials that will keep thermal performance high in exteriors, they ignore the environmental effects of these materials on exterior walls during the production phase. Due to meeting environmental sustainability conditions, materials must be selected to provide optimum values in terms of factors In Turkey, there are standards and regulations about thermal performance or any other performances, but it is obvious that there is a need for legal requirements on sustainability and environment including embodied carbon and embodied energy.

To sum up, it is important to address that the issues have been discussed in this paper are recently analyzed around the world and they show that most countries have been taking action, preparing directives, and creating projects on the purpose of reducing carbon use and other negative environmental impacts in the world where energy consumption and greenhouse gas emissions resulting from human activities are rapidly increasing. This study aims to raise awareness and to help the future research about these issues in Turkey.

REFERENCES

Ayaz, E. & Yang, F. (2010, 01, Sep). Zero Carbon Isn't Really Zero: Why Embodied Carbon in Materials Can't Be Ignored.. Retrieved from https://www.di.net/articles/zero_carbon/

Balouktsi, M., Lützkendorf, T., Röck, M., Passer, A., Reisinger, T. & Frischknecht, R. (2020). Survey results on acceptance and use of Life Cycle Assessment among designers in world regions: IEA EBC Annex 72, Paper presented at the IOP Conference Series. https://iopscience.iop.org/article/10.1088/17551315/588/3/032023/meta

Bektaş, C. (1999). Selçuklu Kervansarayları, Korunmaları Ve Kullanılmaları Üzerine Bir Öneri : A Proposal Regarding The Seljuk Caravanserais, Their Protection And Use. İstanbul,Turkey: YEM Yayın.

Brock, L. (2005). Designing the Exterior Wall. New Jersey.: John Wiley & Sons, Inc.

BS EN 15643-1 (2010). Sustainability of construction works- Sustainability assessment of buildings. Retrieved from BSOL Standards Online.

Ching, D.K.F., Adams, C. (2008). Building Construction Illustrated. İstanbul.: Yapı Endüstri Merkezi Yayınları.

Çetiner, İ. (2017). Bina Elemanlarında Çevresel Sürdürülebilirliğin Değerlendirilmesi, İstanbul Teknik Üniversitesi, İstanbul.

Edwards, B. (1999). Sustainable Architecture: European directives and building design. Oxford: Architectural press.

European Commission (n.d.). Emdodied energy-Introduction. Retrieved from https://ec.europa.eu/energy/content/introduction-3_en

European Commission – Department: Energy – In focus., (2020, Feb 17). Energy efficiency in buildings. Retrieved from https://ec.europa.eu/info/sites/info/files/energy_climate_change_environment/events/documents/in_focus_energy_efficiency_in_buildings_en.pdf

Foster, J., S. (1996). Structure and Fabric Part 1. Harlow: Addison Wesley Longman Limited.

Gürsel, Y. (1993). Mimarlık Nereden Nereye?. Ege Mimarlık Dergisi, 59, 59-61.

Hasol, D. (1965). Endüstri ve Mimarlığımız., Erişim Şubat 02, 2018, Retrieved from http://www.doganhasol.net/endustri-ve-mimarligimiz.html.

Hasol, D. (2010). Ansiklopedik Mimarlık Sözlüğü. İstanbul, Turkey.: YEM Yayın.

Ibn-Mohammed, T., Greenough, R., Taylor, S., Ozawa-Meida, L., Acquaye, A. (2013). Operational VS. Embodied Emissions In Buildings- A

Review Of Current Trends. Energy and Buildings, 67, 479-488. Retrieved from, https://www.sciencedirect.com/science/article/pii/S0378778813004143.

Iddon, C. R., Firth S. K. (2013). Embodied And Operational Energy For New-Build Housing: A Case Study Of Construction Methods In UK. Energy and Buildings, 67, 479-488. Retrieved from, https://www.sciencedirect.com/science/article/pii/S0378778813005380.

IPCC (Intergovernmental Panel on Climate Change). (2007). The Fourth Assessment Report of The Intergovernmental Panel on Climate Change. Geneva, Switzerland: Intergovernmental Panel on Climate Change. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/03/ar4_wg2_full_report.pdf

IPCC (Intergovernmental Panel on Climate Change). (2014). Climate Change 2014 Mitigation of Climate Change Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf

Kim, J. (1998). Sustainable Architecture Module: Introduction to Sustainable Design.Retrieved from http://www.umich.edu/~nppcpub/resources/compendia/ARCHpdfs/ARCHdesIntro.pdf.

Kuban, D. (2007). Mimarlık Kavramları. İstanbul, Turkey.: YEM Yayın.

Manço Mimarlık. (n.d.). Boutique Hotel in Pangalti [digital image]. Retrieved from http://www.manco.com.tr/ProjeDetay.aspx?pid=612.

Pangaltı'da Butik Otel (2017). Yapı Dergisi, 425, 130-131.

Nashed, F. (1996). Time-Saver Details For Exterior Wall Design. New York.: McGraw-Hill.

Sustainable Energy Research Team of the University of Bath (2011), Inventory of Carbon & Energy (ICE)' V2.0. Retrieved from https://www.greenspec.co.uk/building-design/embodied-energy/

T.C. Kültür ve Turizm Bakanlığı İstanbul İl Kültür ve Turizm Müdürlüğü (n.d). İstanbul'da Turizm Çeşitleri, Retrieved from https://istanbul.ktb.gov.tr/TR-276235/istanbul39da-turizm-cesitleri.html

Toydemir, N., Gürdal, E., Tanaçan, L. (2000). Yapı Elemanı Tasarımında Malzeme. İstanbul.: Literatür Yayıncılık.

TS 825 (2013). Binalarda Isı Yalıtım Kuralları. Retrieved from http://www1.mmo.org.tr/resimler/dosya_ekler/cf3e258fbdf3eb7_ek.pdf

United Nations Development Group. (2009). Mainstreaming Environmental Sustainability in Country Analysis and the UNDAF A Guidance Note for United Nations Country Teams and Implementing Partners Teams. Retrieved from https://unsdg.un.org/sites/default/files/Mainstreaming-Environmental-Sustainability-in-Country-Analysis-and-UNDAF.pdf

United Nations Development Group. (2011). Practitioner's Guide: Capacity Development for Environmental Sustainability. Retrieved from https://sustainabledevelopment.un.org/content/documents/954017_UNDP_Practitioner_Guide_CD%20for%20Sustainability.pdf

Yazıcıoğlu F., ve Altun M. C., (2006). İstanbul'da Konut Binalarının Dış Duvarları'ndaki Sistem Ve Malzeme Seçimleri İle Yapım Teknikleri, Çatı Cephe Sempozyumu.

Yıldırım, E. (Photographer). (2016a). Wish More Hotel İstanbul [photograph]. İstanbul.

Yıldırım, E. (Photographer). (2016b). Divan İstanbul [photograph]. İstanbul.

Yıldırım, E. (Photographer). (2016c). Hilton Garden Inn İstanbul Airport [photograph]. İstanbul.

Yıldırım, E. (Photographer). (2016d). Le Meridien İstanbul Etiler [photograph]. İstanbul.

Yıldırım, E. (2018). The Evaluation Of Environmental Sustainability In The Context Of Operational And Embodied Energy On Exterior Wall, Examples Of Hotel Buildings From Istanbul, (master's thesis). İstanbul Technical University, İstanbul, Turkey.

Zhang, X. & Wang, F. (2017). Analysis Of Embodied Carbon In The Building Life Cycle Considering The Temporal Perspectives Of Emissions: A Case Study In China. Energy and Buildings, 155, 404-413. Retrieved from https://www.sciencedirect.com/science/article/pii/S037877881731246X.

VIRTUAL WAY OF REMEMBERING AND FORGETTING OF PLACE

Seda Zafer[1]

Altınbaş University, Turkey
seda.zafer@altinbas.edu.tr

ABSTRACT

The virtual dimension, which has no head and no end, is flowing in space without interruption. Smart mobile phones and social media tools, which reduces the need to be in a certain place at a certain time, carry the perception of the person beyond the horizon of a street. The simultaneous, interactive, and shared communicative process that takes place in the virtual medium is revealed in the integrity of the spatial and collective features by mass media. Existing physical environment and temporary spatial pattern are intertwined. The non-physical transformation of space through social media extends the existing uses of the built environment beyond the measurable features in the urban context. The feature of the usage of social media tools, which can locate places, reach different spaces of the world with live broadcast, and represent spatial features with a 360degree view angle, demonstrates the change in perception of urban space.

The intertwining of social interaction and digital communication brings different orientations towards individual and collective memory. Digital communication tools constitute the spatial equivalent of memory. The fact that people can share on various issues in public environments and that data can be transferred via the internet brings a new situation to the formation of collective memory of a place. The social media tools are not only the recorded, transported, or transmitted spaces of the collective memory, but also the environments in which the connectivity is reshaped and produced.

Mobile access and social media communication, which has become an indispensable element of contemporary daily life, are an interaction area that can be used to strengthen people's relations with cities and places. This study reveals a conceptual pattern between collective memory, urban space and social media. The research is based on the overlapping of memory, place relations and technology dynamics and future spatial research potentials. The study makes inferences about the transformation of the interactive and participatory space experience under the influence of virtual and social technological developments in the perspective of what has happened in the last decade until 2021. It is thought that spatial remembering and forgetting will gain different dimensions. These thoughts constitute the motivation of the research. "Is it possible to reveal the spatial collective memory and definition of place with the shared data of social media and ensure its continuity?" is the question of basic search of this article. In the focus of encountering with urban space, how social media can

contribute to collective memory with its narrative effect on the experience of place is revealed.

Key Words: Social Media; Memory; Place; Virtual space

INTRODUCTION

The widespread adoption of social media has created a paradigm shift, the place and space are isolated from context to which they belong and gained scaleless position in the effect of the internet network. People become aware of other users and their locations on the online map or users store their memories in a certain place in an Instagram story that gives location. Meeting to someone on another continent rather than someone in the same building can be thought of as an electronic construction which has a different existence in time and space (Colomina, 2016) (Boyer, 1995). Very earlier, in his book Media City, Scott McQuire discussed the transformation of the public and private space in the urban experience in this ongoing transformation; He stated that in the 21st century, the world can be seen and perceived over places where it is not existing, and that what is "here" and "there" in the city can no longer be considered separately (McQuire, 2008). By the social virtual patterns in the physical terms, the user describes his/her relationship with the place through participatory and narrative displacement features. The experiential relationship with space is transformed into experience with the features in which they exist, are defined, reflected, photographed as in the digital communication medium (Wigley, 2007).

Social media tools that exist in the space as interfaces also shape the memory of the space as they create a different way of seeing, spatial access and user behavior. The concept of place differs as an external collective memory production through the non-physical context of social media. The aim of the research is to understand spatial memory in the context of the temporary feature of social media that has potentials for place and its experiential relations that go beyond physical space. The question “Is it possible to reveal and maintain spatial collective memory with the shared data and location definition feature of social media?” is the basic pursuit of the research.

Considering the predictions that virtual and social technological developments will increase and transform into an interactive and participatory space experience that works in parallel with the real world in the perspective of what has happened in the last ten years, it is thought that spatial remembering and forgetting will gain different dimensions. These thoughts constitute the motivation of the research. This study reveals a conceptual pattern between collective memory, urban space and social media. The research is based on the overlap of memory, place relations and technology dynamics, and the potentials for future-oriented space research deriving from their overlapping features. Mobile access and social media communication, which have become an indispensable element of contemporary daily life, are seen as an interaction area that can be used to strengthen people's relations with cities and places. It is aimed to reveal the

potentials of collective spatial memory through the spatial experience data of social media tools. As methodology of the article, the spatial transformations are indicated in various aspects due to the advancement of digital communication tools. It has been possible to synthesize the two conceptual framework -communication technologies and memory- parallel to each other in terms of spatial practices. In the focus of encountering with urban space, how social media can contribute to collective memory with its narrative effect on the experience of place is explained.

Transformation of Spatial Experience and Memory in Media Era

Memory is a living and ongoing process that produces memories in relation to their embodied experiences. Since memory refers to remembering and forgetting, it is possible to describe it as a selective process that allows to distinguish between things to be remembered and things to be forgotten. It is not simply a recording of the past, but a reconstructing process of the past as a dual operation in the present (Bartoletti, 2011). Memory is formed by awakening past perceptions similar to daily perception and choosing images and images from among them, so it is the feature that is shaped by experiences in the ongoing flow of the present. Memory is not "storing memories" but rather the useful memory that can complete and illuminate the existing situation in terms of final action. Bergson has deepened the temporal breadth of perception by expressing that the present experience reaches memories and expands forward with the "virtual" lines of future action (Allais, 2016, p.22).

However, individual memory is not something independent of the society or group to which the individual belongs, or the collective memory of that society or group. This idea, which defines the collective memory, expresses the memories shaped by the societies and cultures in which they live (Halbwachs 1992) (Assman, 2001) (Whitehead and Rossington, 2007). According to Van Dijk, collective memory is formed when people somehow become part of a communal past by making a connection between what happened in general and individual participation in what happened (Van Dijk, 2007). Collective memory is not a consolidated summary of defined individual memories and an embodied process, but a formation that can transform with references to objectification forms, rituals and language outside the human mind and body In this context, it is possible to say that collective memory is the natural mediating role of it. More descriptively, the concept that Assman proposes as *communicative memory* refers to the realization of collective expressions through communication with the individual's memories and the narrative of memories (Assman, 2001).

Significant changes in the social structure and relationship patterns of a society affect collective memory through acts of forgetting and remembering. One of the main change as technology leads to radical and effective transformations in lifestyles. As mass communication advances thanks to the internet, media has gained many features such as being able to be shared, produced by everyone and transforming daily life practices. With the intense involvement of the Internet in business and living areas, it

has created a communication revolution in terms of sending and accessing information (Neumann et al., 2005). Technological advances and its temporality which effect memory started a new thinking paradigm because of the occupation of spaces and media (Huyssen, 2000). Emphasizing that there is a direct relationship between the media and memory, Jose van Dijk has argued that the media, which he defines as a mediator in the working processes of embodied human memory, takes place as the basic and dominant dimension of social memory. Talking about an autonomous memory of the media, van Dijk argues that the memory of electronic and digital broadcasting systems is a radical area, both collectively and individually (van Dijk, 2007).

Social media, which is a form of communication in which sharing, and discussion is the basis without time and place limitations, is a big part of daily life. Everyday life turns into one based on hyperconnectivity, which includes actions such as copying, editing, transmitting, sharing, connecting, and liking in digital communication, and this reduces the possibilities of memory being completely destroyed, forgotten, and deleted (Hoskins, 2013, p. 387). Digital communication tools constitute the spatial counterpart of memory. The fact that people can share on various subjects in public environments and the data can be transferred via the internet brings a new situation to the formation of collective memory. Data shared via social networks and short-term agenda are not deleted from the internet's memory. Different reminder formats and tools are now emerging for people who have developed various methods to strengthen memory and provide reminders. While digitalization facilitates processes such as sharing, storing and processing information of places, it transforms the relationship between remembering and forgetting spatially. The place, which contains the time component, is completed in the mind by existing with experience. Mobile communication technologies and social media affect memory processes, especially in a spatial context, to share and make sense of information. Although today's media tools allow to see images of a place, it presents different dimensions of reality as it enables to discover the details of thousands of kilometres away from the place. This situation shows that communication channels are not only the recorded, transported, or transmitted spaces of the collective memory, but also the environments where the memory with connectivity is reshaped and produced.

Research of Spatial Memory Through Social Media

In the 21st century, the fact that smartphones are in everyone's pockets reduces the need to be in certain places at a certain time, but also shows that new ways of mobility in public spaces are revealed. Applications that provide location data, which are diversified with mobile smartphones, create new ways to move around the city and interact with other users. This spatial perception is beyond being portable tools that provide two-way communication; shows that we can think of portable microcomputers located in public spaces.

With the change of action areas, existing urban nodes are transformed without undergoing significant physical transformations. The traditional meeting places of the city are changing the definition of waiting as the act of waiting is transformed through location-based smartphone applications. For instance, With the live location feature of the chat application Whatsapp, it is possible to follow the movement time from one place to another with the people interacted with (Figure 1). It reveals that the physical and spatial counterpart of the action in the city is also transformed by the fact that the meeting gains action towards movement rather than pause.

People become aware of other users' presence on an online map, an Instagram story, or via the location tweet interface. It is becoming common to navigate two areas simultaneously. Gordon and Silva (2011) conceptualize this situation as a net locality; this feature is not something location-aware devices provide themselves; argues that network-based space production emerges as social practices that are experienced and developed over time with technology.

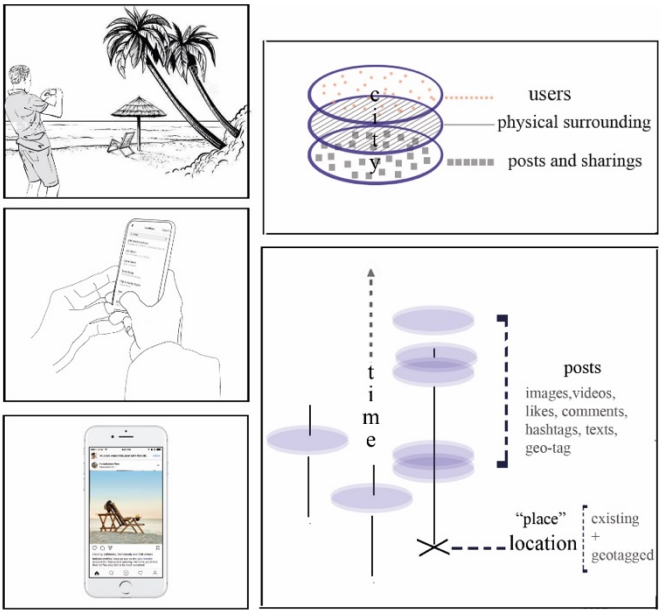


Figure 1. Space and digital sharing layer in the focus of smartphones and posts (Author, 2021)

The virtual and online spatial dimension provided by digital technologies has a mediating and relational role. This intermediary role can make the user a participant and increases the sharing of urban and architectural spaces with location-referenced social media networks. Especially in the context of exploring and experiencing the city, applications with location and direction notifications and visual-oriented social media tools such as maps, Instagram and Facebook have changed the user activity patterns in the city. Before visiting a place, it was possible to form the first impression of a place.

Posting “places” on social media platforms such as Facebook, Instagram or Twitter, using photo, video or text-based comments, offer a virtual fusion with the physical. By combining physical and virtual spaces, a participatory and narrative displacement experience emerges. While walking on the streets, individuals can receive, produce, and send local multimedia content from mobile devices. The non-physical transformation of space through social media carries the existing uses of the built environment beyond measurable features in the urban context (Figure-diagram). The inconsistency of spatial interaction types causes actions such as digital and mobile communication status that enable a certain meeting or social activity to take place interactively, continuously in time and space (Urry, 2003). Invisible, harmonious, uninterrupted, and ubiquitous features create the need of users for the concepts of place, which indicate the interdependent, relational and mutual formation of space and technology.

Images, videos, date and time data, descriptions and hashtags provide a collective representation of urban life across these separate dimensions. Unlike other social media apps, Instagram's image and location-oriented format makes it apparent that it creates a cityscape for locals and visitors alike. Therefore, it is useful for architects, urban designers, and planners to understand what such collective representations entail and how their characteristics relate to both a city's architectural structures (for example, the presence of tourist attractions, the places to meet..) and socio-economic social structures (for example, locations). At the same time, these features reveal references to urban memory.

Making inferences on how location-based services and navigation applications affect users, Frith and Kalin drew attention to the changes in memory applications of such services. Digital memory applications that comply with the rhythms and habits of daily life are revealed as users experience the urban space by generating and following routes digitally and sharing their location with everyone with the location notification (check-in in social media language) feature (Frith and Kalin, 2016, p. 5). It seems possible to reveal and maintain spatial collective memory with the shared data and location definition features of social media. Some social media platforms, such as Facebook and Twitter, can display datasets showing spatial and social behavior in real time. It is possible to witness an important part of personal memories in social media -blogs, v-logs or social networking apps. The data stored in the memory is broadcast and accessible in virtual dimension. These virtual spaces are more than just a place where individual memories are stored: there is the collection, copying and use of data, and global sharing, regardless of physical and limitations. These channels are collective in terms of their formation, uptake and use.

The non-direct ways of communication are directed towards images. The meanings of the information given through images become faster and more effective. The combination of the words Instagram ‘instant camera’ and ‘telegram’ is named as a way of communicating through images; It progresses as an application expressing the "right now, right here" situation (Url-1). The application, which has an interface for sharing frequently, consuming the previous one in a short time and constantly being renewed,

is diversified with updates. Users upload photos, include their Instagram accounts on other social networking services, and follow other users' posts. If someone wants to geotag their post by adding a location, the location can be selected from the bulk list or just added. It includes the motivation of the user to save the place where the photo was taken. Therefore, it is possible to view data points as meaningful places that people know, share, and remember. Thus, anonymous space becomes the place that is a part of recorded and shared moments. Locations have names and the time that they were created. Multiple posts created by different users at different times can be seen. Each post is instrumental as it contains information about time, user, tagged user, text, video, likes and comments. Represents actions by associating them with one or more images. Adding features such as creating stories with personalized narrations that can be added on sequential images provides data to express the user's experience of place and space. The ability to share experiences on mobile via video and image becomes evident in the context of being on the move between spaces.

For example, a mapping project “Queering The Map” is an example that enables the documentation of parks, gardens, streets, avenues and squares, based on the idea of being in places and keeping their experiences in their memories. It is possible to see the traces left about any place in the world in this application, which creates a digital memory in which people specify what is happening and what is happening with their own information input (Url-2).The starting point of the team that developed the project in Montreal was the ability of homosexual individuals to show their presence in the society and to share different memories lived in the same places and make them readable.

The ability for mobile smartphone users to check-in, which triggers a pause and pinpoint action; to make a place meaningful and to focus on its memorability. There are interactions that shape the collective memory by creating stories for places on Instagram. Mobile media users write the histories, memories and identities of their city experiences on places in their posts. It is possible to argue that people who check-in at more than one place in a given time period build a place-to-place trajectory that actively creates connections between these places (e Silva and Frith, 2012, p.179).

For example, Atatürk Cultural Center (AKM) in Taksim Square, which is among the architectural works of the early Republican period of Istanbul, represents a collective spatial memory architecturally. It has been come to the fore frequently since 2003 with its demolition and the replacement of another design. It is a place of memory, holding the cultural, artistic and social accumulation of the period in which it was used, and being a valuable opera house of Istanbul. Although there are collective posts, actions and calls in the media for a cultural loss; It is possible to argue that these processes carry the social spatial memory of the building to different dimensions, such as being in a cultural space, meeting at the entrance of the building, listening to the performances of artists from different countries of the world. Redefining the façade of the building, which was not used in 2010, with banners reminds that AKM is a lively city square component after the period when it was closed and inactive, the visitor photos of the building

before it was closed and the iconic staircase in the foyer were shared extensively on platforms such as Twitter and Facebook to keep its memory up to date. When the demolition of the building started in February 2018 and the new AKM design to be built in its place was shared with the public, a different process started for the citizens who passed by this place every day, went to their work, home and rested in the square. During the demolition that lasted for three and a half months, daily posts on Instagram stories, which were able to stay on virtual media for 24 hours, brought a counter-stance by commenting on Twitter and an intense image sharing **(Figure 2).** In most of the images, the labels '#memory, #memory, #destruction, #theatre, #culture, #theatre, #transformation #deconstruction, #taksim, #beyoğlu' are seen. There are also situations that describe the history and value of the building and express memories in the shares. This situation reveals the active role of digital communication tools in order to protect the collective memory. At the same time, the citizens of the city have become a part of a collective communication with the comments made on their public spaces. This situation also results in becoming associated with these tools even though they have no experience in that place.

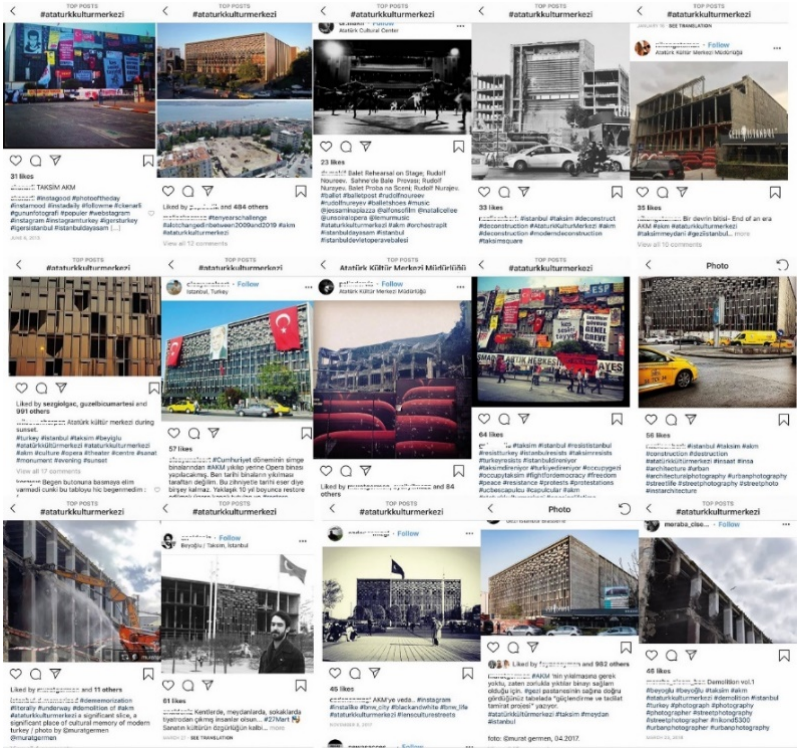


Figure 2. Instagram posts on various processes of AKM (examples were obtained from the posts revealed by searching the 'Atatürk Cultural Center Taksim Square' location and #ataturkkulturmerkezi tag on Instagram during the demolition process) (Zafer, 2019).

CONCLUSION

The digital memory network contains non-physical spatial potentials. The information layer of social networks combines with traditional methods in spatial readings of the city and creates new types of guides. Through spatial analysis, the investigation of the social and public space character in everyday life and directions to future urban space designs are progressing. Within these orientations, sharing the moments, creating stories added to the flow of daily life and geotagging activities in the geographical context are important in terms of reference to the collective memory.

The widespread use of new technology by becoming an extension of human beings (producing visual sharing, creating content for public space and experiencing this virtual plane together with its reality) becomes effective in the image of the city and therefore in the collective memory. This situation creates spatially distinctive and conscious behaviours beyond just having a living memory for remembering in continuity. The effect of the lived and experienced in the formation of collective memory, which is related to temporary and spatial frameworks, is important, and the tools that will trigger actions that call to remember are contributing in this context.

Participation and interactions in urban space through spontaneous social media tools support the idea that virtual tools can be used to strengthen and preserve urban collective memory. On the other hand, place-defined media tools, beyond a fixed storage, make memory, mobility and human scale temporary as ongoing events that incorporate social life.

Active participation and sharing, as important definitions of digital network memory, are focused on the space-user relationship, which becomes evident with the production of personal narratives of the participants within the global narratives. Layered and dynamically, collective memory gains a dimensionless feature in the dominant visual layer of communication tools rather than its sensory effect. At the same time, there is a transformation from the synchronized structure of information to the understanding of living space fed by events. The position between the information flow and the individual becomes blurred, and the individual takes variable positions within the plural perspective, thus creating the effect of collectivity and spontaneity in the extension of memory.

REFERENCES:

Allais, L. (2016). Tam Zamanında: Henri Bergson ve Akropolis'in Korunması için Yapılan Entellektüel Çalışma, 2000+ Mimarlık Teorisinin Acil Sorunları, Mark Wigley, James Graham, Janus Yay., Istanbul, 21-42

Assmann, J. (2001). Kültürel Bellek, Eski Yüksek Kültürlerde Yazı, Hatırlama ve Politik Kimlik. Ayşe Tekin (Çev.). İstanbul: Ayrıntı.

Bartoletti, R. (2011). Memory and social media: new forms of remembering and forgetting. Learning from memory: Body, memory and technology in a globalizing world, 82-111.

Boyer, M. C. (1995). CyberCities: visual perception in the age of electronic communication. Princeton Architectural Press.

Colomina B. (2016). Sosyal Medya Çağında Özel ve Kamu, 2000+ Mimarlık Teorisinin Acil Sorunları, Mark Wigley, James Graham, Janus Yay., Istanbul, 109-121

e Silva, A. D. S., & Frith, J. (2012). Mobile interfaces in public spaces: Locational privacy, control, and urban sociability. Routledge.

Frith, J., & Kalin, J. (2016). Here, I used to be: Mobile media and practices of place-based digital memory. Space and Culture, 19(1), 43-55.

Gordon, E., & e Silva, A. D. S. (2011). Net locality: Why location matters in a networked world. John Wiley & Sons.

Halbwachs, M. (1992). On Collective Memory. Lewis A. Coser (Ed.). London: The University of Chicago Press: London.

Hoskins, A. (2013). "The end of decay time". Memory Studies 6 :(4), Routlegde, 387-389.

Huyssen, A. (2000). Present pasts: Media, politics, amnesia. Public Culture, 12(1), 21-38.

McQuire, S. (2008). The media city: Media, architecture, and urban space. Sage.

Neumann, M.O'Murchu, I., Breslin, J., Decker, S., Hogan, D., & MacDonaill, C. (2005). Semantic social network portal for collaborative online communities. Journal of European Industrial Training, 29(6), 472-487.

Urry, J. (2003). Social networks, travel and talk. British Journal of Sociology, 54 (2), 155–75

van Dijck, J. (2007). Mediated memories in the digital age. Stanford University Press.

Wigley, M. (2007). The Architectural Brain. Network practices, new strategies in architecture and design, 30-53.

Zafer, S. (2019). Kolekttif Hafıza ve Mekansal Pratiklerin Dijital İletişim Araçları Etkisinde Dönüşümü. İTÜ, Institute of Science. (unpublished master's thesis)

URL-1 The meaning of Instagram https://www.rewindandcapture.com/why-is-it-called-instagram/ (12.08.2021).

URL-2 The Queering Map https://www.queeringthemap.com/ (12.08.2021).

A RESEARCH ABOUT SMART FACADE MATERIALS WITHIN THE CONTEXT OF SUSTAINABLE ARCHITECTURE

Ayşenur KARAKAYA[1], Seden ACUN ÖZGÜNLER[2]

[1] Istanbul Technical University,Turkey
karakayaa19@itu.edu.tr
[2] Istanbul Technical University, Turkey
acunsed@itu.edu.tr

ABSTRACT

In recent years, attainment and applying information about smart materials has become a research topic in the field of sustainable architectural approaches and applications. Along with smart materials, the perspective of materials that defends the requirement of not being affected by external environmental conditions as well as preserving their qualities has begun to be replaced by the understanding of external stimuli response. This is carried out to improve user comfort and energy performance of various buildings. Smart materials can adapt themselves to environmental circumstances by reversibly reacting to external stimuli and altering their quality and energy.

The aim of this study is to investigate the status and importance of material performance and potential on building facades, taking into account the use of smart materials on facades within the scope of sustainability. In order to explain the material performance and potential on building facades, smart material approaches and definitions used in the facade are explained, classified, and their energy performances are examined through different studies and buildings. Their use in the field of architecture is still under investigation except for a few material groups. However, smart materials have a great potential in the field of architecture within the scope of sustainability. Through this study, the possibilities of using smart materials, which will have an important role in the near future within the context of sustainable architecture on building facades are presented.

Key Words: Facade Materials; Smart Materials; Energy Efficient Materials; Sustainability; Material Science

INTRODUCTION

Through the diversification of building functions and changing living standards over the years, user comfort conditions have changed, and as a result, the performance parameters expected from buildings have increased. Throughout all ages, human beings have used the available material capacity of the era and environment in the most appropriate way to make their living space more comfortable. Scientific developments in materials science and advances in building construction technologies have led to increase the performance of the materials, thereby meet user needs. Smart materials have emerged as a result of this search for ages and advances in scientific and technological developments.

Until the 20th century, materials were expected not to change their properties during the use of materials due to environmental impacts since the material changes in properties have been expressed as only harmful effects (decay, corrosion, collapse, mold, etc) (Okay, 2003). Along with smart materials, the perspective of materials that defends the requirement of not being affected by external environmental conditions as well as preserving their qualities has begun to be replaced by the understanding of external stimuli response. This is carried out to improve user comfort and energy performance of various buildings. Smart materials can adapt themselves to environmental circumstances by reversibly reacting to external stimuli and altering their quality and energy. Besides the external stimuli that reduce the performance of the material are still undesirable, it has been discovered that some external stimuli may be turned into advantage to improve building performance within the context of sustainability.

As a building component, facade separates the interior and exterior while interacting with physical, chemical and biological stimuli between two different environmental conditions; it is an important interface in energy consumption, user comfort and sustainable architecture. Performance parameters expected from the buildings are mostly related to the indoor environment such as thermal comfort, lighting, ventilation, and acoustic quality, which are directly associated with the facade. However, providing users' requirements may cause higher energy consumptions due to the over costs. Transparent envelopes, especially in large facades in the buildings have a large amount of total heat loss. Reduction of heat loss through two or three layers of flat glass filled with a low conductivity gas to the gaps between layers or low-emissivity (low-E) coatings are be able to used to improve the performance of the facade. However, these types of glazing systems may constitute decreasing daylight and solar gain, which is related to overheating (Burton, 2001). In the field of architecture, solar shading systems are also designed to aim reducing building energy consumption while providing user comfort. However, its applicability in all buildings is not sufficient due to the wide application area in high-rise buildings, the cleaning and maintenance needs of systems.

Particularly, in facades, factors such as daylight, visual and thermal comfort affect the quality of users' comfort conditions and energy consumption. With this regards, facade materials and construction systems are important

factors for building performance criterias. Technological developments in the field of materials science and architecture give a rise to development of new materials. The aim of this study is to investigate the status and importance of material performance and potential on building facades, taking into account the use of smart materials on facades within the scope of sustainability. In order to explain the material properties, smart material approaches and definitions used in the facade are explained, classified, and their energy performances are examined through different studies. Their use in the field of architecture is still under investigation except for a few material groups. However, smart materials have a great potential in the field of architecture within the scope of sustainability. Through this study, the possibilities of using smart materials, which will have an important role in the near future within the context of sustainable architecture on building facades are presented.

DEFINITION OF SMART MATERIALS

In the field of architecture, various terms are used to define smart materials such as adaptive systems, responsive materials, intelligente systems, etc. (Abdullah, Al-Alwan, 2019). The term 'responsive architecture' is used for the first time by Negroponte in 1970 to infere 'intelligent facade' that works with integrated sensors on the structure of facade. The basis of working in the intelligent façade is based on the assessment of external stimulus on a computer through sensors. The first example to refer this term is Institut du Monde Arabe (Paris, France, 1981-1987, Jean Nouvel). Lighting in the facade automatically controlled by light sensors that are integrated with me chanic diaphragms (Negroponte, 1970).

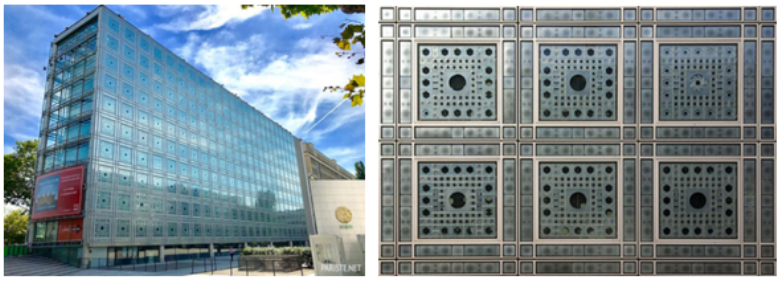


Figure 1. Institut du Monde Arabe and Mechanic diaphragms **(URL-1)**

After the industrial revolution at the end of the 19th century, the traditional material understanding and facade systems have been changed through developments in facade technology and gain awareness for a sustainable future (Orhon, 2012). In the 20th century, Addington&Schodek and Ritter have developed pioneering works on smart materials and their potentials for the first time in 2005 and 2007 respectively, which are accepted the main approaches to define and classify smart materials in the field of architecture (Addington & Schodek, 2005; Ritter, 2007).

For Ritter, the term 'intelligent' is not in address with the smartness of the material properly, since, in order to define a material as intelligent, the material should accord with computer science directly. Through the invention of smart materials, the material as a building component have been getting to use as a sensor and/or an actuator to adapt without needing the computer (Addington & Schodek, 2005; Ritter, 2007). In study "Today and tomorrow of polymeric materials (in Turkish)" Okay highlights that all materials have a certain degree of smartness. For example, they expand or stretch due to temperature changes. However, these changes may not be reversible, thus, smart materials are able to reverse to their inherent properties to the contrary (Okay, 2003). Briefly, smartness in the material is an extensive term, which contains various capabilities such as immediacy, transiency, self-actuation, selectivity and directness, that distinguish smart materials from accustomed traditional materials (Addington & Schodek, 2005).

CLASSIFICATION OF SMART MATERIALS

The classification of smart materials is informed by synthesizing the two approaches that are accepted as the main references for researches. Classification of smart materials should be multi-layered according to its physical behavior and phenomenological behavior. Initially, smart materials can be classified in two fundamental groups, which are defined how internal changes occur under an external influence. If the material's molecular structure or microstructure is altered by an external input, the material changes its intrinsic properties. In smart materials, this type of change can be named as property changing smart materials (Type 1). In energy exchanging smart materials (Type 2), the energy state of the material exchanges its form besides changes its internal structure. The molecular structure/microstructure stays the same whereas an energy transform emerges and thus the material respond with a change indeed. In either case, the changes maintaining in micro-scale (Addington & Schodek, 2005).

Table 1. Smart Materials Classification (Addington & Schodek, 2005).

SMART MATERIALS	
Property-Changing Smart Materials (Type 1)	Energy-Exchanging Smart Materials (Type 2)

* Immediacy – Smart materials respond to the stimuli in real-time.

* Transiency – Smart materials respond to more than one stimulus or environmental effect.

* Self-actuation – What controls the smart material to respond (the material's intelligence) is internal to the material rather than being external.

* Selectivity – Smart materials' response is distinct and can be predicted.

* Directness – Smart materials' response is confined to the 'activating' event (Addington & Schodek, 2005).

Smart Material Systems

Smart materials are generally the component of a system. Smart material systems are classified as passive, active, and hybrid based on how to respond to the external influences besides respond type (Addington & Schodek, 2005). In passive smart material systems, the system responds directly and reversibly without the need an activator. Energy requirement for the change can be supplied from the environment as closed-loop processes. Photochromics can be an example for this group. If the processes are controlled through sensors or activation sytems, these systems are defined as active smart material systems, for instance electrochromic smart material systems. In a hybrid system, it can briefly described as the combination of passive and active systems. The material can be respond passively, but the system works as an active system (Addington & Schodek, 2005; Lelieveld, 2013).

Table 2. Smart Material Systems Classification (Addington & Schodek, 2005).

SMART MATERIAL SYSTEMS		
PASSIVE SYSTEMS	ACTIVE SYSTEMS	HYBRID SYSTEMS

Table 3. Smart Material Systems Classification (Addington & Schodek, 2005).

External Stimulus	→ Passive Systems	Action/Actuation
External Stimulus	Control System → Active Systems	Action/Actuation

Property-Changing Smart Materials (Type 1)

Property changing smart materials have a broad range in the field of architecture, especially in facade technologies. The materials can change their property or properties (shape, color, and adhesion) in response to an external input reversibly (Addington & Schodek, 2005).

Shape-changing smart materials are able to reversibly change their shape and/or dimensions in response to one or more stimuli through external influences, the effect of light, temperature, pressure, an electric or magnetic field, or a chemical stimulus. Among these, there are materials and products that are able to change their shape without changing their dimensions, and some products that retain their shape but change their dimensions. Some are also able to change both parameters at the same time (Ritter, 2007). From the perspective of the facade engineering, currently thermostrictive smart materials have the greatist field (Addington & Schodek, 2005). Thermobimetals and shape memory alloys are the pioneering works thermostrictive smart materials. (Ritter, 2007).

Energy-Exchanging Smart Materials

Energy exchanging smart materials may be named as 'First Law Materials' according to the approach of Addington and Schodek, since the working principle is based on the first law of thermodynamic. In order to generate an output energy, an input energy exchanges its form (Addington & Schodek, 2005).

Energy exchanging smart materials contains photoelectric, piezoelectric, piroelectric, and thermoelectric materials in the field of facade engineering, but most of them are potential applications based on therotical studies (Orhon, 2013).

Table 4. Smart Facade Material Classification According to Their Reactions (Nestle et al, 2018)

Color/Opacity Change	Heat Flow Direction	Shape Changing	Humidity Absorption
Thermochromic	Phase Change Materials	Piezoelectric Materials	Hydrogel
Photochromic		Shape Memory Polymers	
Thermotropic		Shape Memory Alloys	
Electrochromic		Thermobimetals	

POSSIBLE DESIGN POTENTIAL AND LIMITATIONS OF SMART MATERIALS IN FACADE TECHNOLOGIES

One of the most important tasks for designers is sustainability and energy efficiency in the field of facade engineering. Facade is vitally important aspect of sustainability as they are the building envelopes in which the most heat is lost in winter period and the most heat is gained in the summer period. In this regard, several façade materials and technologies have been carried out in order to provide better interior environment and energy efficiency simultaneously (Altın & Orhon, 2016).

Traditional materials can be chosen as different absorption capability colors depends on the climate conditions. For instance, in hot climates, light colored façade envelopes reflect the solar radiation in order to reduce heat gains as well as dark colored finished materials are used to gain more benefits from the sun. However, in climates with a temperature difference between summer and winter (such as continental climate), there is a considerable temperature changes all the year around (Nestle et al, 2018)

In the standpoint of architecture, sustainability is providing energy efficiency through reduction of energy use, using renewable energy sources, local and recycled materials, designing building components according to the law of conservation of energy in consideration of climate conditions (Altın & Orhon, 2016). However, available materials and construction systems may be remained incapable, since the need of increasing expectations from the buildings in today's technology. Therefore, local materials could be insufficient in some cases. In this regard, a dynamic facade envelope that adapt itself to the change through reverse its color state is a decent solution within the scope of sustainability.

Smart materials have a great potential in the field of architecture. Most of the smart materials are still under research, since there is a lack of using them in construction industry. In today's technology, new innovations on material technologies and manufacturing processes may cost much more when compared to the traditional materials. However, material lifespan is a major impact on sustainability as well as the total amount spent for manufacturing and maintenance steps (Elattar, 2013).

Table 5. Smart materials that are used in opaque exterior components in facades (Juaristi, Monge-Barrio, Sánchez-Ostiz, Gómez-Acebo, 2018)

Exterior Component	Smart Material Class	Facade Element	Role in Facade
Exterior Cladding	Thermochromic	-Film -Pigments -Powder -Plastic Pellets -Dyes	Temperature Change (color switch)
	Electrochromic	-Film	Solar Reflectance (Opacity Switch)
	Photochromic	-Film	

Thermal and visual comfort are the major performance parameters for the human health and building sustainability. If thermal and visual comfort conditions can not be achieved in some climate conditions, mechanical solutions are needed for heating, cooling, and lighting demands.

In opaque components in facades, thermal insulation materials and systems are more advanced when compared to the transparent components. Although daylight is an essential factor for the visual comfort, solar radiation and inherent lights of the sun may be cause undesirable heat gains and losses from facade throughout the year (Nestle et al, 2018)

Although transparent envelopes on facade have a major impact on the performance of the building and the nontransparent envelopes have advanced solutions, opaque materials' sustainabiliy should also be considered. Currently, phase changing smart materials are available on the market as exterior claddings. Several studies show that these materials have a remarkable role on controlling thermal performance on facede (Monge-Barrio, Knaack, Gómez-Acebo, 2018)

Table 6. Smart materials that are used in opaque interior components in facades (Juaristi et al, 2018)

Interior Component	Smart Material Class	Facade Element	Role in Facade
Interior Cladding	Hydrogels	-Device -Surface	Hygrothermal Control

Hydrogels can optimize humidity in the air, which a venomous environmental damage, and thus provide cooling effect through their high humidity absorption (Markopoulou, 2015).

SMART WINDOWS

Smart windows have an adaptive performance on facade, which provide shading, temperature optimization, user comfort, and energy efficiency. Recently, smart windows are the widest adaptive façade envelopes in the market. Mainly, smart windows are the window systems that generally optically changing-behaved (photochromic, thermochromic, and electrochromic) thin films applied façade components (Juaristi, Monge-Barrio, Knaack, Gómez-Acebo, 2018)

Addington and Schodek entitle this term chromics or color-changing smart materials. In fact the term of color changing does not mean that the materials change their colors. The material changes its optical properties and this change is perceived as a color and/or opacity changing by human eye (Addington & Schodek, 2005). Colour- and optically changing smart materials has the greatist interest in the field of architecture (Ritter, 2007).

Table 7. Smart materials that are used in transparent exterior components in facades (Juaristi et al, 2018)

Exterior Component	Smart Material Class	Facade Element	Respond
Smart Window	Thermochromic	-Film -Pigments -Dyes	Self Shading
	Photochromic	-Film	
	Electrochromic	-Film	
	Thermotropic	-Film	

Smart windows with thermochromic, photochromic, electrochromic, and thermotropic films have designed for controlling glare and heat gains. Thermochromic and electrochromic materials are mainly rectangular rolls and self-changing smart materials are mostly manufactured as strips (Juaristi, Monge-Barrio, Knaack, Gómez-Acebo, 2018)

Photochromic Smart Materials

Photochromic materials absorb electromagnenic energy in the ultraviolet area. The molecular structure of the material changes when exposed the external input, and thus transition or reflection between the certain wavelengths cause an property change on the material. When the UV source is stopped, the original transparent and colorless state reverts due to its reversible feature (Addington & Schodek, 2005).

Photochromic materials have a wide range of use in the field of architecture, which are photochromic pigments, photochromic glass and photochromic plastics (photochromic polymers) (Ritter, 2007).Photochromic thin films have a great potential for smart window technologies. The glazing gets clear as a standard colorless glass when interrupt the environmental influence in a short time (Addington & Schodek, 2005).

Thermochromic Smart Materials

Thermochromic smart materials change their optical properties through absorbing heat. When the external temperature is changed, a reversible change emerges inside the material. Even if thermochromic smart materials show the same behaviour as photochromics, they are markedly different due to the ultraviolet wavelengths may cause major optical deformations on thermochromics (Addington & Schodek, 2005; Ritter, 2007).

Figure 2. Thermochromic glass in different states (Ritter, 2007)

In the field of architecture, the first application was a wall installation covered with thermochromic latex paint in the Musée d'Art Moderne de la Ville by the German artist Sigmar Polke in 1988 (Ritter, 2007)

One of the disadvantages of thermochromic smart windows, the UV may damage on the facade surface (Juaristi, Monge-Barrio, Knaack, Gómez-Acebo, 2018)

Thermochromic materials may also used as exterior claddings as well as smart windows (Juaristi, Monge-Barrio, Sánchez-Ostiz, Gómez-Acebo, 2018)

Electrochromic Smart Materials

Electrochromic smart materials change their optical properties when an electric current is applied. Even a small voltage of electric is enough to change the transparency and the color state reversibly. Although electrochromics are called as materials, they are multi-layered systems.

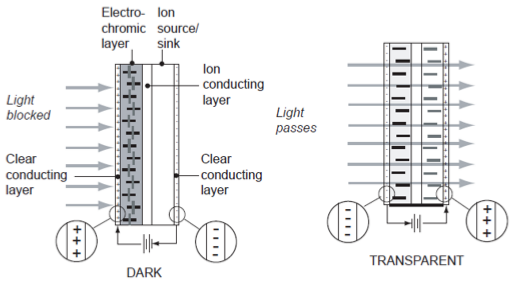


Figure 3. Electrochromic glass working principle (Addington & Schodek, 2005)

Fundamentally, hydrogen or lithium ions are conducted from a layer that store them through a carrier layer to an electrochromic layer, which is generally tungsten oxide (WO3). When a voltage is applied, the ions are carried to the opposite direction, the electrochromic material gets darken reversibly. Alhough the opacity of the material can be controlled by users and thus enhance the user comfort, it is also a disadvantage due to need for electricy to activate the system in the scope of sustainability. However, electrochromic materials is the greatest potential in the field of architecture. Furthermore, there are currently available manufacturers (Addington & Schodek, 2005). Electrochromic smart windows with oxide films such as VO3 need lower activation energy when compared the other electromic products (Juaristi, Monge-Barrio, Knaack, Gómez-Acebo, 2018)

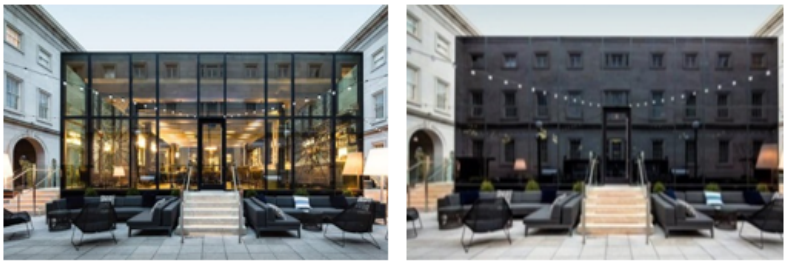


Figure 4. Electrochromic glazing in Dirty Habit DC facade (Addington & Schodek, 2005)

Phase-Changing Smart Materials

All materials can exist in gas, liquid or solid states and change their physical states under different conditions. Phase changing processes involve absorbing, storing or releasing of great amount of energy. Briefly, phase changing smart materials benefit from this energy (Addington & Schodek, 2005; Ritter, 2007).

Table 8. Smart materials that are used in intermediate layer of components in facades **(Juaristi et al, 2018)**

Component	Smart Material Class	Facade Element	Role in Facade
Intermediate Layer	Phase-Changing Smart Materials	-Intermediate Layer -Device	Integrated Thermal Control

Senior Citizens' Apartments designed by an insulation glass through filling it a phase-changing smart material (salt hydrate) on the façade system in order to store heat. Briefly, the interior temperature can balance through changing the phase of material according to the exterior environment.

Figure 5. Chanel Ginza Building **(Ritter, 2007)** Senior Citizens' Apartments

Adhesion-Changing Smart Materials

Adhesion-changing smart materials classify in five groups which are photoadhesive smart materials, thermoadhesive smart materials, electroadhesive smart materials, hyrooadhesive smart materials and bioadhesive smart materials (Addington & Schodek, 2005; Ritter, 2007).

Titanium dioxide (TiO2) is the greatest class of photoadhesive materials. In the perspective of facade technologies, titanium is an important nanomaterial in material science as its self-cleaning features, which also reform harmful impacts to smaller particles. TiO2 is used in ceramic ceramic surface coatings due to its photocatalytic effect (Ritter, 2007).

Monte Verde is an example that constructed with TiO2 based membranes in 2004 Vienna, Austria. West and east sides of the building is designed with photocatalytic self-cleaning surfaces in ceramic façade. The coating on the facade use light to emerge a hydrophilic surface in order to clean itself from the particles such as dust. In addition, there is also a light-responsive air cleaning effect through activated oxygens, which is generated by the surface of the coating (Ritter, 2007).

Figure 6. Photocatalytic facade of Monte Verde **(Ritter, 2007)**

"Scientific tests have shown that 1000m2 of photocatalytic-coated facade surface achieved an air cleaning effect that was the equivalent of 70 medium-sized deciduous trees. Pro-rata the 6800 m2 ceramic facade of the Monte Verde would be the equivalent of 476 similar trees, put aside its additional qualities and functions such as the oxygen production. For some

cities with severe air pollution, photocatalytic ceramic facades would help to ensure that air pollution does not increase, assuming that enough natural light of the correct wavelength range strikes the facades." (Ritter, 2007).

CONCLUSION

In the field of architecture, lifespan of the building system and the material is an important issue for designers. Local materials are one of the best solutions within the scope of sustainability. However, along with high-rise buildings, advanced building systems and increased user needs, local materials have become deficient. One of the most important advantages of smart materials is that they can be produced, since they are not local materials. Therefore they can be manufactured and used in a wide range of market, include Turkey. Even if the process involves more steps that uses energy, the total energy demand in the lifecycle of the building is much lower.

Along with smart windows, overheating and energy losses from facade can be optimized, solar gain and glare can be controlled, and user comfort can be enhanced. Furthermore, photochromic smart materials have a major role to reduce total energy use for cooling and heating energy depending on the climate in the scope of sustainability. One of the most important disadvantage of thermochromics is shorter lifespan due to effect of temperature. Electrochromics have an adventage of allowing user control, since opacity state control can be achieved by user in every conditions. Although, using electricity to activate electrochromics is an disadvantage within the scope of sustainability, it is a small voltage that can be ignored. Also, electrochromic materials have the widest area in the market, which are the most accessible smart material family.

In today's technology, smart materials and their applications on façade are still under research. Therefore, there are some gaps in the knowledge how to practice with available informations and largely confined designed samples. Furthermore, collabration of the literature, laboratory studies manufacturing and applications in construction area according to the knowledge should be tasks for all who are in charge. Thus, the possible incompatibility problems based the material capabilities (such as thickness, width, length, possible geometries, available colors) with the need could be avoid. In Turkey there are available smart material applications based on interior smart thin films in order to control the opacity of the glass by devices.

Further researchs are still needed for different climate conditions and building types with various occupant demands and facade sizes through numerical assessments. Nevertheless, there are available manufacturers and application informations on the manufacturers' websites for some products. Thus, smart materials will have a greater area in near future.

REFERENCES

Okay, O. (2003). Polimerik Malzemelerin Bugünü ve Yarını. Retrieved from http://web.itu.edu.tr/okayo/Davetli_okay.pdf

Negroponte, N. (1970). The Architecture Machine. Cambridge: M.I.T. Press. https://doi.org/10.1016/0010-4485(75)90009-3

Altın, M., Orhon, A, V. (2016). Enerji Korunumunda Adaptif/Uyarlı Cepheler. Mimar Sinan Güzel Sanatlar Üniversitesi,Fındıklı, İstanbul: 8. Ulusal Çatı ve Cephe Sempozyumu. Retrieved from http://catider.org.tr/pdf/sempozyum8/13-ENERJI-KORUNUMUNDA-ADAPTIFUYARLI-CEPHELER.pdf

Addington, D. M., & Schodek, D. L. (2005). Smart materials and new technologies : for the architecture and design professions. Amsterdam: Elsevier, Architectural Press.

Ritter, A. (2007). Smart materials in architecture, interior architecture and design, Basel-Berlin-Boston: Birkhauser.

Lelieveld, C. M. J. L. (2013). Smart Materials For The Realization Of An Adaptive Building Component. Delft University of Technology. http://doi.org/10.1017/CBO9781107415324.004

Orhon, A. V. (2012). Akıllı Malzemelerin Mimarlıkta Kullanımı. Ege mimarlık, 82, 18-21. http://www.egemimarlik.org/82/18.pdf

Abdullah, Y. S., Al-Alwan H. A.S. (2019). Smart material systems and adaptiveness in architecture. Baghdad, Iraq: Department of Architecture/College of Engineering, University of Baghdad. https://doi.org/10.1016/j.asej.2019.02.002

Juaristi, M., Monge-Barrio, A., Knaack, U., Gómez-Acebo, T. (2018). Smart and Multifunctional Materials and their Possible Application in Façade Systems. Journal Of Facade Desİgn & Engıneerıng. Volume 6 / Number 3. https://doi.org/10.7480/jfde.2018.3.2475

Juaristi, M., Monge-Barrio A., Sánchez-Ostiz, A., Gómez-Acebo, T. (2018). Exploring the Potential of Smart and Multifunctional Materials in Adaptive Opaque Façade Systems. Journal Of Facade Desİgn & Engıneerıng Volume 6 / Number 2. https://doi.org/10.7480/jfde.2018.3.2475

Nestle, N., Juaristi, M., Alston, M., Aelenei, L., Romano, R., Mazzucchelli, E. S., Rico-Martinez, J.M. (2018). Case Studies - Adaptive Façade Materials. TU Delft Open for the COST Action 1403 adaptive facade network. Retrieved from https://www.researchgate.net/publication/330170323_Case_Studies_-_Adaptive_Facade_Materials

URL- 1. Retrieved from http://www.pariste.net/wp-content/uploads/2014/05/ArapDunyasiEnstitusu-InstitutduMondeArabePariste.Net01.jpg>, erişim tarihi 17.12.2019

THE PLACE OF ADOBE MATERIAL IN MODERN ARCHITECTURE AND DESIGN POSSIBILITIES

Ali YILDIZ[1]

[1]*Yozgat Bozok University, Turkey*
ali.yildiz@bozok.edu.tr

ABSTRACT

Earth, which is one of the oldest building materials, has contributed to the development of vernacular architecture by taking place in different ways within the structure. Due to developing materials and techniques and needs, the way of use of earth in the building has changed and its use as an industrial product has become widespread. Such use of earth has caused the use of adobe in the building to remain in the background and gradually abandoned its use. In this study, the place of earth material in architecture from past to present and its design possibilities were investigated, applications on mud brick materials and adobe stabilization and their reflections on design were examined. Especially in the framework of modern architecture, the possibilities of using earth as a building material and the unique values that earth material will gain in contemporary designs were investigated. In this context, within the scope of the study, the compilation of the data in the literature and the traditional building samples constructed using earth material and the applications of earth in modern architecture were compared. The use of earth material in the masonry system as bearing, or filling in the wooden frame system at the buildings built with traditional construction techniques has guided the designs and limited the space dimensions and building heights. In contemporary designs, the earth material, which is improved with various methods, allows the production of building elements in different forms, increasing the possibilities of using it with other building materials.

Key Words: Adobe; Vernacular Architecture; Ecology; Sustainability; Modern architecture

INTRODUCTION

Earth, one of the main constituent of nature, responds directly or indirectly to almost all the needs of humanity as one of the few components that make up the center of life. From centuries ago to the present, societies built structures by shaping the earth material in order to meet the need for shelter and continued their lives in a dependent manner on the earth. However, during the industrial revolution and afterwards, the organic bond of human with the earth began to weaken, and with modern life, people moved away from the earth. However, as the social awareness increased, human beings started to understand the importance of nature and earth again by making an effort to return to the essence. Although it is considered as a building material identified with underdeveloped societies and otherized, the earth material maintains its importance in terms of being a natural, ecological, sustainable and economical building material.

Historically, earthen materials have been employed as building material for thousands of years of human existence. Earth construction is the oldest building practice known, with documented cases of the use of earth bricks in Mesopotamia around 10,000 B.C. adobe (mud brick) was employed as the building material in almost all ancient cultures, not only for residential buildings, but also for public structures as well. However, adobe is generally referred in different appellations. Scientifically, the term adobe refers to a clay mix, silt, sand, and sometimes coarse aggregates such as gravel. To talk of the synthetic unbaked brick typology, terms “mud bricks” or “adobes” are usually engaged (Costa et al, 2019; Obafemi and Kurt, 2016).

The simple character of the buildings constructed with mud brick material and their prominence with their functional aspects cause their designs to be otherized. At this point, the effect of the construction of the buildings with a simple understanding by the local people within the local possibilities is great, and the adobe material remains in the background as "other building material" since it is not well known by today's architects. However, adobe should stand out as an indispensable material for the development of natural, healthy, ecological and sustainable designs. In order to strengthen the earth, mud brick material was obtained by adding various components to it, and its strength was increased with applications such as firing the earth with the developing technology and adding various binders to it. Thus, earth material could be used for multi-storey and complex designs.

In the context of modern design understanding, the earth material, which is behind other building materials, should be improved in various ways and developed as an alternative to concrete material in particular and made preferred in building construction. As a matter of fact, the investment costs and energy needs of the facilities required for the production of cement, which is one of the basic components of concrete, are very high. Accordingly, when the environmental impact of the production process and the recyclability of concrete within the scope of its life cycle are evaluated, the superiority of adobe material is important in terms of today's environmental policies. Similarly, the facilities needed for the production of bricks and the need for energy also highlight earth material. In addition, low thermal conductivity of the earth and the fact that the adobe material

obtained by adding natural fibers to it is produced by hand-compressing, therefore, the formation of micro-cavities in its structure contributes to the comfort level of the buildings in terms of thermal insulation and reduces the energy need.

In order to improve the material in earth structures produced by traditional methods, different techniques such as compression, adding natural fibers into the earth were applied, while the material obtained by firing the earth led to the development of the brick. Brick, on the other hand, is separated from the earth material in terms of thermal properties, as well as the production process and life cycle. Improvements are made in the form of adding binders such as gypsum and lime, using synthetic fibers instead of natural fibers, or applying both methods together, in order to increase the resistance of the earth against effects such as water and moisture, as well as mechanical effects, while preserving the properties of the earth (Acun and Gürdal, 2003; Aghazadeh, 2011; Çavuş et al, 2015; Değirmenci, 2008; Gül, 2011). In this way, earth materials are developed that allow the production of building components/elements in finer sections and different forms. Especially in order to improve the earth material in order to increase the applicability of prefabricated production methods, the studies will contribute to the greater preference in the designs.

THE USAGE OF ADOBE IN VERNACULAR ARCHITECTURE

The adobe material has been used in the construction of buildings, especially in the economically weak areas where other building materials such as wood and stone are not widely available. Due to its relatively easy construction and the fact that the materials used in its composition are found in almost every region, adobe structures were built in a wide geography (Fig. 1). Accordingly, different types and forms of buildings emerged due to the differences in the materials used in adobe construction, different climatic conditions, changing needs, and different cultural characteristics, and construction techniques specific to adobe structures have developed (Fig. 2-3).

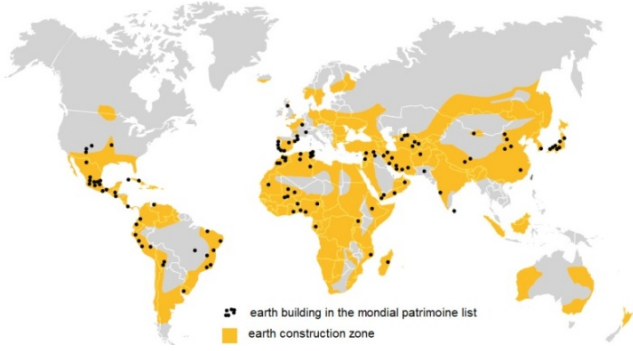


Figure 1. Earth construction in the world with heritage UNESCO (Daudon et al, 2014)

Figure 2. Adobe structures designed in different types and forms in the worldwide (Corday, 2020; Moxon, 2002; Ribarska, 2016; Zimmer, 2014)

Figure 3. Adobe buildings from Turkey, a) Balıkesir b) Elazığ

Adobe buildings produced by traditional construction techniques have developed within the framework of local facilities, as they do not require significant knowledge of mastery. Especially in the construction of structures in rural areas, the use of adobe has become widespread due to material possibilities, labor and production costs. In addition, due to the fact that mudbrick material can be produced with simple hand tools and the construction of the building is simple and quick, its construction was mostly carried out by the building owners. Thus, adobe structures developed within the framework of user needs and possibilities were generally shaped in a simple character and functionally. Generally, adobe buildings for residential use were built as one or two storeys with a simple plan understanding, and due to the material limitations the space dimensions were kept small (Fig. 4).

Figure 4. Interior views of an adobe building

There are several earth construction techniques employed worldwide such as cob, rammed earth (“pisé de terre”, “taipa”), “wattle and daub” (“tabique”), and adobe (Costa et al, 2019). Depending on the cultural interaction, there have been similarities in the techniques and designs applied in the construction of adobe structures in different countries (Fig. 5). In general, the walls of mud brick structures built with masonry system are made thick to ensure the bearing property. In order to increase the height of the wall and the load bearing capacity, placing wooden beams or stone blocks in the wall structure is also one of the techniques applied in the masonry system. In addition, adobe material is also used as a filling between the wooden frame system, so that the advantages of adobe can be partially used by reducing the thickness of the walls (Fig. 6).

Figure 5. Adobe buildings from Turkey and Bulgaria, a) Yozgat b) Balıkesir c) Kardzhali

Figure 6. Masonry and wooden frame structural systems in an adobe building

ADOBE AS A CONTEMPORARY MATERIAL AND ITS DESIGN POSSIBILITIES FOR MODERN ARCHITECTURE

The weak mechanical properties of adobe, and its instability to water-moisture and atmospheric effects, and being a heavy material limit its use. Especially in large span and multi-storey building designs, it becomes impossible to use adobe material produced by traditional methods as structural system material. Additionally adobe material buildings produced by traditional methods are insufficient to provide contemporary comfort conditions for reasons such as the necessity of resolving wet spaces within the building. In addition, the advantages provided by the use of earth material in buildings show that improved adobe material can be used as an alternative to concrete and brick in modern designs. Mud brick provides the opportunity to create healthy environments/spaces due to its low thermal conductivity and high heat storage properties as well as it is natural material. Furthermore, as an ecological material, its importance for sustainable green building designs is increasing day by day.

Methods for Improving Adobe

While the adobe material produced by traditional methods consists of clay, silt, sand and sometimes coarse aggregates such as gravel composition, in some regions, natural fibers are also added to this mixture. Techniques applied to improve the properties of adobe can be listed as compression, adding binder and/or additive materials, and adding synthetic fibers to the composition. By applying these techniques together, the desired improvement in material properties can be achieved. In addition, adobe structures created by filling the earth in bags and stacking it on top of each other (superadobe) also reflect the developments in adobe materials. This method is similar to creating a barrier by stacking sandbags for military defense or stream control.

In the 18th century, the technique to produce “compressed earth blocks” by means of a manual press became popular in Europe. This technique made it possible to work with lower water contents in the soil mixtures than for the adobe blocks and the blocks can be stacked immediately after production (Vyncke et al, 2018). This technique allows the production of earthen blocks in different forms and with holes in the middle. Thus, the specially profiled earth blocks are better interlocked to each other, while the holes created contribute to reducing the weight of the wall (Fig. 7).

Stabilizers such as lime, gypsum, cement, bitumen or resins were added to improve the earth properties (Değirmenci, 2008; Zak et al, 2016). The use of cementitious material like Portland cement, hydraulic lime and lime-pozzolana mixes as stabilizer is quite common. The strength of the soil can be increased reasonably by cementing clusters of particles in a manner similar to that of binding aggregates in concrete. Pozzolanic reactions between lime and certain clay minerals form a variety of cement-like compounds that can bind soil particles together and at the same time reduce water absorption by clay particles. Bitumen, asphalt and certain resins as stabilizers act as water proofing agents by providing a physical barrier to the

passage of water (Hossain, 2007). Industrial wastes such as silica fume and phosphogypsum are also used as pozzolanic material for the improvement of adobe (Değirmenci, 2008; Erol, 2000; Kıvrak, 2007).

Figure 7. Different types of compressed earth blocks (Rabie, n.d.)

The use of natural (plant or animal origin) fibers in the production of adobe with traditional methods has a positive effect on its mechanical properties and limit shrinkage. However, the limited strength of natural fibers and the loss of their properties over time also affect the properties of adobe. In the studies carried out for the improvement of adobe material, the properties of the material have been improved by using synthetic fibers instead of natural fibers (Binici et al, 2005; Gül, 2011).

Superadobe techniques consist of introducing local soil and small amounts of a binder in degradable bags that serve as the formwork and as confinement of the filling. The bags are stacked one over the other forming the walls of the house. The earthbag technique uses regular bags to contain the soil, whereas the superadobe employs long bags (Fig. 8-9) (Canadell et al, 2016).

Figure 8. Structures built in different forms using superadobe (Moon, 2020)

Figure 9. Majarah Residence project (Ravenscroft, 2020)

Adobe in Modern Architecture

The knowledge gained from traditional structures contributes to the development of modern designs. In particular, traditional mud brick structures provide direction to the designs of modern adobe structures in aspects such as materials, techniques and forms (Fig. 2-8). In modern adobe building designs developed for rural areas, forms compatible with traditional adobe structures are designed, inspired by local architecture (Fig. 10). In addition, the application of improved adobe material together with contemporary materials ensures the development of original projects (Fig. 11). Adobe material produced by modern techniques facilitates the design of wide and multi-storey structures by expanding the limits of space dimensions, make possible for the passing of wide spans and reducing the thickness of the bearing walls. By using adobe material in contemporary designs, it is possible to construct sustainable, ecological and modern structures with minimum costs (Fig. 12).

Figure 10. Adobe buildings constructed with contemporary design conception by applying traditional techniques (Cemil_dr, 2018)

Figure 11. A modern building design in which steel space frame as a roof, reinforced concrete coloumns and compressed earth blocks are used together (Slessor, 2009)

Figure 12. The H2OS project is a prototype house constructed of compressed earth block, that can harvest and store water supplies for all domestic uses and to integrate the scarce water resources in a few artificial walls (“Category: Compressed Earth Block”, 2021).

CONCLUSION

Due to the development of building materials and construction techniques, changing needs and lifestyle, industrialization, pushing the limits in architectural designs, the use of industrial building materials, especially concrete, reinforced concrete and steel, has become widespread instead of traditional materials such as adobe and stone. Especially the advantages of reinforced concrete and steel materials in terms of structural, economical, flexibility and durability have caused them to be preferred in designs and traditional building materials to remain in the background.

The fact that the adobe material, whose use has decreased over time, is not sufficiently recognized by the architects and users, has led to its not being included in the designs. Due to the fact that adobe structures require constant maintenance, cannot respond to changing needs, cannot show the desired performance in terms of structural and earthquake safety, and ease of access to other building materials, its use in rural areas has also decreased and it has become a preferred material in economically weak areas. However, the fact that adobe material allows the design of healthy spaces and has a low environmental impact has made it come to the fore again for contemporary building designs. In addition, solutions for improving the properties of mud brick material and using it with other building materials allow the development of original designs.

By using improved adobe, it is possible to design thin and aesthetic building elements instead of thick and heavy building elements, to create large surface windows and to use daylight at the desired level with perforated adobe blocks to be used within the wall. In addition, by using adobe material as a filling in steel, reinforced concrete or laminated timber frame systems, the wall thicknesses can be further reduced and spaces of desired dimensions can be designed. Thus, with the solutions to be applied in contemporary designs, the weaknesses of adobe material will be eliminated and its advantages will be utilized. Reinterpretation of adobe material with a modern design approach make possible the development of original projects, as well as the design of sustainable, ecological and aesthetic structures.

REFERENCES

Acun, S. and Gürdal, E. (2003). Yenilenebilir Bir Malzeme: Kerpiç ve Alçılı Kerpiç. Türkiye Mühendislik Haberleri, 427, 71-77.

Aghazadeh, E. (2011). Kireç ve Alçı İçeren Toprak Yapı Elemanlarının Fiziksel ve Mekanik Özellikleri. Master Thesis, Istanbul Technical University, Graduate School of Science Engineering and Technology, Istanbul, Turkey.

Binici, H., Aksogan, O. and Shah, T. (2005). Investigation of Fibre Reinforced Mud Brick as a Building Material. Construction and Building Materials, 19, 313-318.

Canadell, S., Blanco, A. and Cavalaro, S.H.P. (2016). Comprehensive Design Method for Earthbag and Superadobe Structures. Materials and Design 96, 270-282.

Category: Compressed Earth Block. (2021, February 13). Retrieved from http://eartharchitecture.org/?cat=79

Cemil_dr. (2018, November 26). Konya Hüyük Çavuş Sonsuz Şükran Köyü Kerpiç evler [Tweet]. Retrieved from

https://twitter.com/cemil_dr/status/1067050790966181891/photo/3

Corday, K. (2020, September 8). This is the Oldest Building in the US. Retrieved from https://www.grunge.com/244438/this-is-the-oldest-building-in-the-us/

Costa, C., Cerqueira, Â., Rocha, F. and Velosa, A. (2019): The Sustainability of Adobe Construction: Past to Future. International Journal of Architectural Heritage, 13(5), 639-647.

Çavuş, M., Dayı, M., Ulusu, H. and Aruntaş, H.Y. (2015). Sürdürülebilir Bir Yapı Malzemesi Olarak Kerpiç. 2nd International Sustainable Buildings Symposium, Ankara, Turkey.

Değirmenci, N. (2008). The Using of Waste Phosphogypsum and Natural Gypsum in Adobe Stabilization. Construction and Building Materials, 22, 1220–1224.

Daudon, D., Sieffert, Y., Albarracín, O., Libardi, L.G. and Navarta, G. (2014). Adobe Construction Modeling by Discrete Element Method: First Methodological Steps. Procedia Economics and Finance, 18, 247-254.

Erol, Ö. (2000). Uçucu Kül Katkısıyla Kerpiç Üretimi Üzerine Bir Araştırma. Master Thesis, Gazi University, Institute of Science and Technology, Ankara, Turkey.

Gül, T. (2011). Cam Elyaf ve Hava Sürükleyici Katkı Kullanılarak Geliştirilmiş Kerpiç. Master Thesis, Istanbul University, Graduate School of Science Engineering and Technology, Istanbul, Turkey.

Hossain, K.M.A., Lachemi, M. and Easa, S. (2007). Stabilized Soils for Construction Applications Incorporating Natural Resources of Papua new Guinea Resources. Resources, Conservation and Recycling, 51, 711–731.

Kıvrak, J. (2007). Silis Dumanı Katkılı Kerpiçlerin Mekanik ve Fiziksel Özelliklerinin Araştırılması. Master Thesis, Gazi University, Institute of Science and Technology, Ankara, Turkey.

Moon, O. (2020, September 7). Casas de Superadobe: Qué Son y Cómo se Hacen. Retrieved from https://ecodominicana.com/casas-de-superadobe-que-son-y-como-se-hacen/

Moxon, M. (2002, December 7). Mali: Dogon Country. Retrieved from https://www.moxon.net/mali/dogon_country.html

Obafemi, A.P.O. and Kurt, S. (2016). Environmental Impacts of Adobe as a Building Material: The North Cyprus Traditional Building Case. Case Studies in Construction Materials, 4, 32-41.

Rabie, O. (n.d.). Revealing the Potential of Compressed Earth Blocks. Retrieved from http://eartharchitecture.org/uploads/Rabie.pdf

Ravenscroft, T. (2020, 15 December). ZAV Architects creates colourful domed cultural retreat on Iranian island of Hormuz. Retrieved from https://www.dezee n.com /2020/12/15/zav-architects-holiday-accomodation-hormuz-iran/

Ribarska, A. (2016, June 15). Old Walled City of Shibam, Yemen, 2006. Retrieved from https://www.icomos.org/en/mediatheque/historic-towns-and-villages/7486-old-walled-city-of-shibam-yemen-2006-7486?tmpl=component

Slessor, C. (2009, October 1). Primary School by Diébédo Francis Kéré, Gando, Burkina Faso. Retrieved from https://www.architectural-review.com/today/primary-school-by-diebedo-francis-kere-gando-burkina-faso

Vyncke, J., Kupers, L. and Denies, N. (2018). Earth as Building Material – an Overview of RILEM Activities and Recent Innovations in Geotechnics. 2nd International Congress on Materials & Structural Stability, MATEC Web Conf. Volume 149, 1-7.

Zak, P., Ashour, T., Korjenic, A., Korjenic, S. and Wu, W. (2016). The Influence of Natural Reinforcement Fibers, Gypsum and Cement on Compressive Strength of Earth Bricks Materials. Construction and Building Materials, 106, 179-188.

Zimmer, L. (2014, June 18). These Earthen “Beehive” Houses Have Been Keeping Syrians Naturally Cool for Centuries. Retrieved from https://inhabitat.com/these-earthen-beehive-houses-have-been-keeping-syrians-naturally-cool-for-centuries/

AN INVESTIGATION ON PHYSICAL ENVIRONMENT OF EARTH-SHELTERED BUILDINGS

Merve BİLGİNER[1], Şensin AYDIN YAĞMUR[2], Konstantinos SAKANTAMIS[3]

[1] Yildiz Technical University,Turkey
mervebilginer.arc@gmail.com
[2] Yildiz Technical University, Turkey
sensina@yildiz.edu.tr
[3] Aristotle University of Thessaloniki, Greece
ksakanta@arch.auth

ABSTRACT

The study was conducted to measure architects' perspectives on the environmental conditions of Earth-sheltered structures. The basic problem is that earth-shelter structures or underground architecture give bias to people. The hypothesis is with the modern earth-sheltered examples and accurate terminology, prejudices may be broken. And the research starts with the process of Earth-sheltered structures in history and future expectations. The study is based on s web-based survey. Description of the earth-shelter term was expressed to samples with the help of sections and definitions. Visual, thermal, acoustical and air quality comfort condition are asked to the samples on the web-based questionnaire. The literature searched for the subjects of "Earth-sheltered Buildings", "Sustainability", "Cave dwelling", "Building Physics Conditions of Underground Houses". People close to the field of architecture were aware of such structures, but it was also observed that most of the subjects did not experience earth-sheltered buildings. The function of the building is also an important item for subjects. Towards two types of function, people broke bias about earth-shelter housing especially the prejudgments about visual and air quality comfort conditions. The fact that such structures, which have been used since the history of humanity, are suitable for human habitat, is evident by their use by people for many generations. The preconceptions against the Earth-shelter structure will be broken by increasing information and building examples.

Key words: Earth-sheltered Buildings; Sustainability; Cave dwelling; Building Physics Conditions of Underground Houses.

INTRODUCTION

Using the term as an earth shelter house is a euphemistic way to use the underground house. If the house uses the earth as a thermal mass, it is an earth shelter house. For this, the house can be covered on all sides or partly with soil. Also synonyms are earth house, earth-bermed house and underground house.

Earth-sheltered buildings responded to many types of functional requirements in all eras. But still, people have prejudged and less knowledge causing from fewer experiences. The web-based survey which was conducted for this study try to find bias levels and changed them in a positive way. These kinds of studies done before in different ways such as giving conferences and web-based studies together. One of them is named "*Measuring people's perception towards Earth-sheltered buildings using a photo-questionnaire survey*" by Heba Hassan and others. (Hassan, 2016). And the study put the result that the bias can break with knowledge and experience.

The study, which is made by Hassan and others, used the photo-questionnaire survey and interviews with samples from Egypt and Japan. The measurements items are knowledge and bias towards the Earth-sheltered buildings among the architects, architecture students and teachers. In the study, examples of this building type were given in the interview, and the participants evaluated the structures with adjectives on the web-based survey before and after the interview. Adjectives were dampness, darkness, coldness, dusty, etc. kind of bad adjectives and calm, warm, secure, economic, etc. good adjectives. At the result, most of the samples changed their ideas in a positive way.

In this study, direct questions about comfort conditions are chosen because adjectives can create bias. Firstly, the participant answered which job they have. Categorizes are architecture university student, postgraduate student, teacher and architect and for the control group is other.32 participants joined the survey.9 people of them have jobs which irrelevant to architecture.

What Is The Earth Shelter Building

The most comprehensive description of the earth-sheltered building is this type of building has a thermally significant amount of soil or substrate in contact with its external envelope. This definition means in practice is that earth-sheltered architecture includes buildings that have earth against their walls, on their roofs, or are entirely underground. (Low impact, 2020)

Malcolm Wells who is father of earth-shelter told us what an earth-shelter building with his illustrated is (Fig.1).

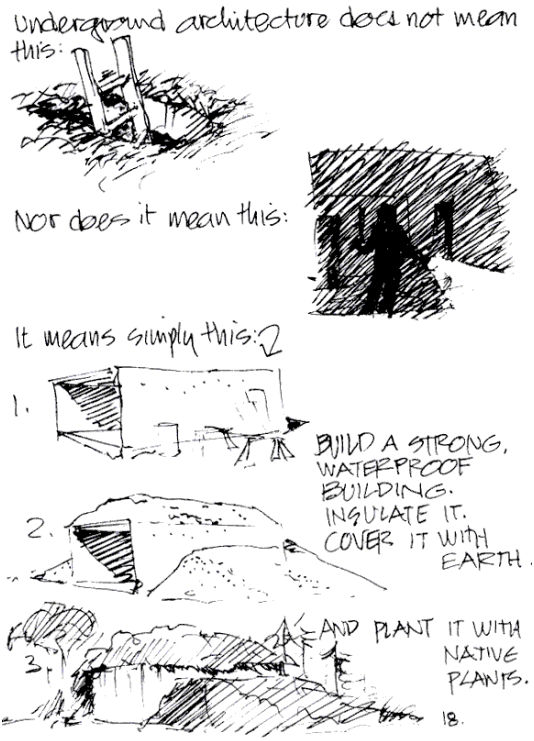


Figure 1. Malcolm Wells illustrated about underground building.

Historical Process of Earth-Shelter

In this section, it will be examined what the process is, why and how the earth sheltered is used. In this regard, historical progress is divided into four eras through examples. The first one is a more generalized era as background. Second is earth shelter emerges as the new term. The third is in the modern sense of earth shelter and the last one is future expectations and possibilities.

Background

In the earliest prehistoric era, before Man knew how to build shelters, they made use of the natural environment to provide them with shelter. One of these shelters was existing caves. This kind of place today gives us clues about the ancestors of humanity and so they are very valuable about archeology and anthropology.

Long before recorded history, man and animal alike have harnessed the insulating and insulative properties of soil, developing sophisticated, but

basic, methods of dealing with severe climates and dangerous situations. Ranging from arid deserts to polar cold regions, subterranean dwellings offer refuge from exposure to the sun, wind, storm, and extreme variations in atmospheric temperatures, as well as providing thermal compensation for seasonal temperature changes. The practice of underground architecture has a tremendous heritage that is rich in spatial variety, in response to the overall environmental milieu, and in the diversity of design solutions to such issues as access, ventilation, lighting, and cultural values. Troglodytic communities have existed in areas all over the world, including Turkey, Egypt, Ethiopia, Israel, China, North Africa, and the American Southwest, to name a few (Labs, 1975). And also in the old times, underground cities were the primary structures that would provide the best protection in wars.

Golden Era of Earth Sheltered House

The earth-shelter method is the oldest ancient method as humankind. After some technologies about building construction, people retired about that some requirements like an energy-saving, adaption of land. To understand how to notice earth shelter techniques by people, it should be looked at how to change the world.

When we came in the 18th century, the first population increases were observed by decreasing the mortality rates with advances in medicine (Buchwitz, 2013) then, with the industrial revolution, the increase in population accelerated. Therefore energy consumption increased and an energy crisis occurred in the world.

For the first time in 1987, the concept of sustainability has emerged formally (Commission, Brundtland, 1987). The efficient use of energy in buildings is crucial for a sustainable future. As a result, a high proportion of energy was consumed worldwide.

Most of the energy consumed during building use is due to the density of heating and cooling loads. The façade between the atmosphere and the building has energy transfer in the shell. It is not possible to completely prevent the flow of energy. However, it can be slowed.

To reduce this energy loss various insulations are applied throughout the building. The energy transferring duration of the applied material, briefly phase difference, shows the best performance if the phase difference operates in the hot and cold time recess. The most important feature of Earth-sheltered houses is energy conservation by seasonally processing the phase difference. In this respect, in the 1970s, features became popular with environmentalists.

Malcolm Wells, Mike Oehlar, Peter Vetch are some of the pioneer architects of earth-sheltered housing.Wells lived on Cape Cod, Massachusetts in a modern earth-sheltered building of his design (Fig.2)

Figure 2. Cape Cod, Malcolm Wells.

Mike Oehler was a defender of back to the land movement in the 1970s and he was known for low-cost, sustainable underground house designs. He believed the underground houses have more advantageous from above house and also more economical. He published a book that named “The $50 & Up Underground House Book” (Geiger, 2015).

Peter Vetch is also the important name for the earth-sheltered house. Vetsch has had his own architectural practice in Zurich and he has been a pioneer for earth houses since 1974.

He manages to design building shells that cover maximal space volume with a minimum of surface area, an excellent form for energy savings, using sprayed concrete constructions technology (architektur, 2014). These constructions eschew right angles and their spatial diversity overcomes the monotony of traditional normed designs.

Nine houses (Fig.3) is designed by Peter Vetch. The most important design issue where the project must be integrated into the environment as much as possible and houses have usable roofs.

Figure 3. Peter Vetch, Nine Houses, Dietikon

Modern Earth-sheltered Buildings (Earth-sheltered building at 21st century)

In recent years, architects worried about the adaptation of the environment for their design. With this concern, there are some perfect projects adapted to their environment. In this study, those projects are used as examples to change their bias.

A Modern Earth-sheltered House

Aloni House is not only provided to all earth-sheltered house conditions but also is one of the most important earth-sheltered buildings in modern times (Fig.4). It was built in Antiparos Island in Greece and won the Greek Piranesi Award in 2009. The structure embodies everything that a modern-day earth shelter entails. (Anselm, 2012)

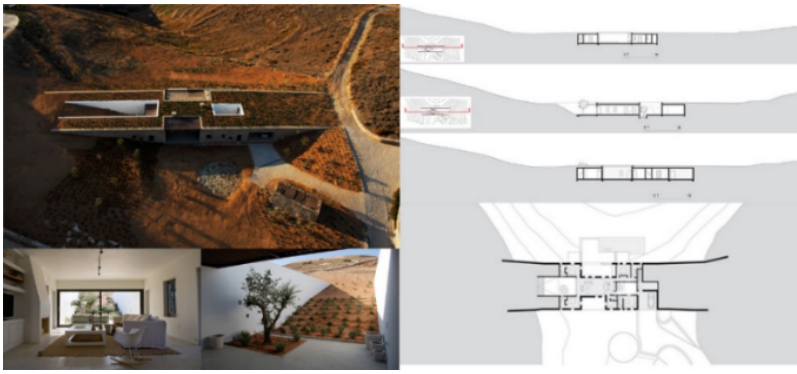


Figure 4: Aloni House, Antiparos Island in Greece. By Deca architects

Aloni House is placed in a hot and humid climate zone. While courtyards protect the rooms from direct solar penetration, green roofs stabilize the interior temperature. The four courtyards also separate the house into five interior areas so all rooms can take natural lights. The house orientation and materials provide a comfortable zone from humidity and bad climate condition. Air circulation occurs thanks to the reverse direction. Local resources, such as stone and clay from the countryside are used in the underground construction to increase energy efficiency and protect the house from bad weather.

Modern Earth-sheltered Building

The earth-sheltered building can be used not only as a residence but also for different functions such as public, commercial or religious, etc. buildings.

The Main Library in Aristotle University of Thessaloniki is an underground building. The library was chosen as one of the 130 most important buildings of the twentieth century in Greece by the Hellenic Institute of Architecture

and the Deutsches Architektur Museum, and was awarded the first prize of the Hellenic Institute of Architecture "Architecture 2000" by an international jury as the best public building in Greece from 1995 to 1999 by an international jury.

Professor of Aristotle University, Anastasios Kotsiopoulos, and architects Morpho Papanikolaou and Rena Sakellaridou designed the project. On the north-east side of the current Main Library, the concept called for the building of an entirely subterranean wing.

The composition is symmetrically arranged around a cylindrical atrium (Fig 6.), which is intersected by the main entrance to the library's interior and a pedestrian walkway that runs laterally to the previous structure. The new building's curving outer wall and the old structure's elevation combine to form a new pedestrian corridor that is part of the campus's overall mobility system. (Kotsiopoulos, 2010).

Figure 5: An interior view of SAU central library buildings.(Dadoudis,M,2021)

Figure 6: Schematic elevation and relationship with two library (Google Earth)

As shown the figure 6, Auth central library has two buildings one of them is above the ground and the other one is underground as mentioned before. The subterranean library, in my experience as a user of two library buildings, is quieter and more comfortable for the library user, especially since it is sheltered from direct sunlight.

Future expectations

The earth sheltered building can respond some problematic theories in the future. The first theory is about climate condition. With global warming the cities will have an extreme climate. That is time earth-sheltered building will be chosen as best option by people.

There is a perfect example Coober Pedy (Fig. 7) about which city has extreme climate condition. Coober Pedy has a hot desert climate and occasional dust storms. The desert environment is a harsh dry one with extremely hot and cold temperatures, so about 80 percent of the current population live underground.

The opal mine, which was converted into an architectural space by the workers in the first years of the mine, was transformed into an underground city through technology in the following periods. The town has one thousand five hundred residences, entertainment venues, businesses, culture, and art venues (Fig. 8).

The city is living underground. It has the underground church, a gift shop, a few museums, a casino, and the local pub. According to interviews in extreme towns, people in there are satisfied from this situation. Underground condition much better than above ground (Richards, 2009).

Figure 7: Coober Pety city view. (southaustralia.com)

Figure 8: Coober Pedy`s Serbian Orthodox Church, Museum, Shop (southaustralia.com)

The second theory is about the increased population. The population of the world is increasing rapidly and over 50% of this population lives in cities (worldbank, 2020).By 2050, two-thirds of the world's population is predicted to reside in cities, making urban space an increasingly scarce resource.(Nash, BBC, 2015)The Due to land constraints, heritage zones, and other issues, the structure required to accommodate this rising population is insufficient in the city core. Underground structures are anticipated to be able to meet these needs.

Figure 9: Singapore underground city project (Yingxin Zhou)

The population of Singapore is nearly 5.5 million people, corresponding to 710 sq km of the earth for the population. Singapore has been reclaiming land for decades, but that is increasingly unsustainable due to rising sea levels and other impacts of climate change. So the city is going underground. It is thought that using underground to grow the city is a great solution for Singapore by experts from a non-governmental organization that designs and analyzes cities' subterranean spaces. Underground Space City project is working on for expected to solve the structure required for Singapore (Nash, 2015).

The other examples is about problematic heritage areas. In competition of Evolo 2010, there is a futuristic project which called “Earth-scraper” designed by BNKR Arquitectura. The main square of Mexico City (Fig. 10), known as the “Zocalo” is 57,600 square meters (240m x240m), is bordered by the Cathedral, the National Palace and the City Government. Federal and local laws prohibit to demolish this heritage area and put the limitation as 8 eight stories. Earthscraper concept in there as a 300m underground pyramid is aimed to fix Mexico City's residential problems.

The structure is designed as an inverted pyramid (Fig.10) with a central void to provide natural sunlight and ventilation to all living spaces. The large hole is covered with a glass floor that allows the life of the Earth scraper to merge in with everything going on top, in order to preserve the myriad activities that take place on the city center year-round.

Figure 10: Zocalo square, Mexico City and Earthscraper (BNKR)

This futuristic project has also too many opportunities. It meets construction need, if it is compared with the skyscraper, there are going to be less effect to climate, less energy consumption in utilizing, more wind and earthquake protection, avoid from direct solar gain, and one of important land use.

Although all advantageous there are some worries. Like would residents feel like troglodytes, living and working hundreds of meters beneath square? How to protect from infiltrations? Is the construction cost affordable? Would the energy requirements of lighting the structure's darkest depths? What is going to respond to the earth about scraping? How will the substructure be resolved? Is it going to be really eco-friendly as like aim?

Nevertheless, if it goes on to innovative ideas, these types of projects can shed some light on energy problems and urban problems for future.

Study

The study embodies not only a literature scan but also a web-based survey to measure people`s attitudes about earth-sheltered building comfort conditions. The survey was conducted with 32 people. 23 of them have in one way or the other a relationship with architecture. From the sample 12,4,3,4 are architects, architecture university teachers, architecture postgraduate students and architecture university students respectively . The survey measured the subjects' reactions. Such as whether they had any knowledge pertaining to earth-sheltered structures, whether they had prior experience of the same, their responses were also studied after the cross-sections of earth-sheltered habitations were shown to them and the change in their attitudes before and after the modern examples were presented to them.

One of the questions asked to the respondents of this survey was; have you ever heard of the term "Earth-Shelter"? As seen in table below, 62.5% of the participants claimed they heard of the term "Earth-Sheltered". Of the 20 the people asked, 17 have a relationship with the field of architect and 3 people are from the control group claimed they had heard of it. That is to mean the formers are closer to the issue and earth-sheltered is not a common term in the public domain. The education level of the subjects was also put into consideration during the conduction of the survey. While 50% of the undergraduate students have heard the term before %75 architects and architectural university teachers and all postgraduate students have heard the term.

23 people which also included people who claimed they didn`t hear the term "Earth-shelter" described the term, and 15 of them claimed they know means the term. 12 people nearly described the meaning of an earth-sheltered building translation into 40% of the candidates who had knowledge or so of what earth shelter is.

Table 1. Respond to the knowledge about Earth-Shelter

Have you ever heard the term "Earth-Shelter"?				
	Total	Yes	No	%
Architect	12	9	3	75%
Arch. Uni. Student	4	2	2	50%
Arch.Postgraduate	3	3		100%
Arch. Uni. Teacher	4	3	1	75%
Control Group	9	3	6	25%
Total	32	20	12	62.50%

The next step, in the survey concentrated on whether the subjects had experienced such structures. From the explanation of the term earth shelter - as the building which uses earth for thermal mass - a response to confirm it was expected from the subjects above. The building can be covered on all sides or partly with soil and also, synonyms are earth building, earth-bermed building, and underground building. 8 people representing 25% of participants, had experienced earth-sheltered buildings. 5 of them had an experience of less than a day. One person had an experience of more than a day and less than a week, another respondent had an experience of more than six months but less than a year, and the last person had an experience of more than a year. It can be concluded that just two people had lived in this kind of house and 6 people (5 architects, 1 other) who had claimed knowledge of the terminology at the beginning of the survey. This can be understood as 25 % of the participants have less bias about the Earth-Sheltered building because they had experience.

Approach of the typology

Many types of earth-sheltered buildings can be built, figure 11 depicts some types of Earth-sheltered buildings. However, the cross-section of the earth-sheltered building in this research is the same as the one used in the research by Heba Hassan and others to compare the results of the outcome (Fig 16).

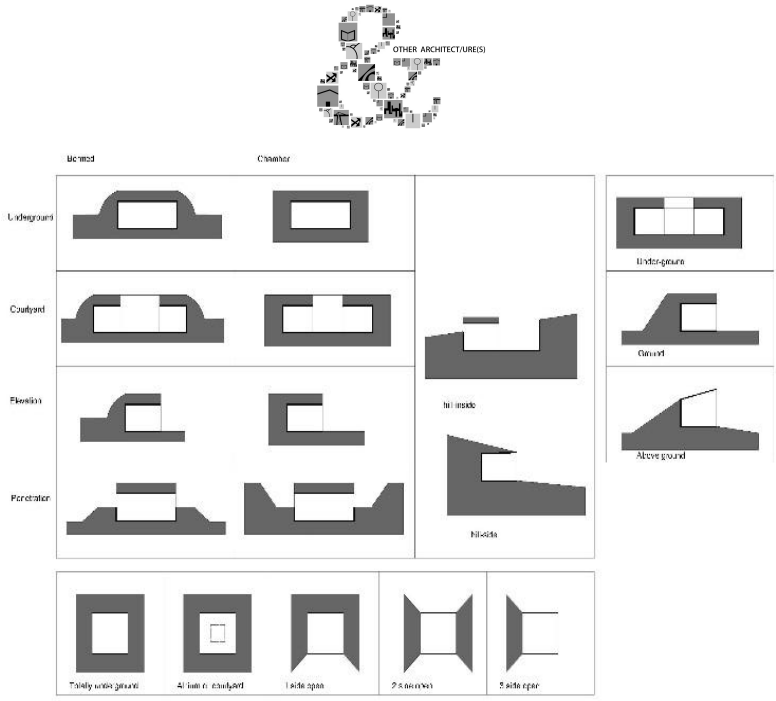


Figure 11. Types of Earth Shelter buildings

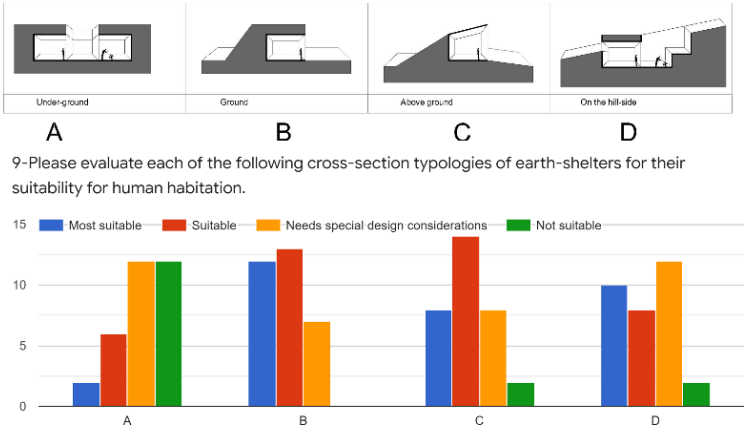


Figure 12. Cross section typology of Earth shelters and evaluation

Cross-sections are related to the ground levels and the participants evaluate them for suitability for human habitation. As seen on figure 12, A represents a fully developed underground house with a courtyard, type B is a ground level house and C is an above ground level house. Type D was created on the hill. Depending on the other research (Hassan, 2016), type A was selected as a not suitable cell for human habitation. In this research, the same typology is considered not suitable by 37.5% of the samples and the same amount of the samples consider that this type needs special design

consideration, even though 25% of respondents chose the most convenient (most suitable and suitable).The majority of the participants voted low to A.

Respectively, 37.5%, 40% of participants rate B as the most suitable cell and suitable cell. And also it is clear from figure 16 B have been chosen the most suitable cell. Although the type of D, on the hill, has been chosen as most suitable and suitable by 31% and 25% of participants, 56% of participants gave positive react, 37.5% of participants evaluated it as a needy special design and a tiny fraction of participants assumed D is unsuitable. Type C cell, above the ground, is considered suitable by %68 of the participants, 25% of participants voted it as the most suitable and %43 of samples voted suitable. As a result, while type A is deemed unsuitable and type B is deemed the most appropriate, type C is preferred over type D.

Samples in the study by Hassan and others revealed that types B and C were the most suitable habitations whereas types A and D were unsuitable. Despite minor differences, the results of this poll are consistent with previous research.

Before showing the modern building examples, the survey asked for an evaluation of environmental comfort conditions based on their own experience. %25, %6 of people consider visual quality comfort to be comfortless and too comfortless. Air quality comfort is evaluated as comfortless by half of the participants and 6% of samples rated too comfortless.

And as seen on figure 13, thermal and acoustical quality comfort are rated high.

These results are important to understand what people think about the earth shelter building and they are used for comprehension with modern examples in the next step.

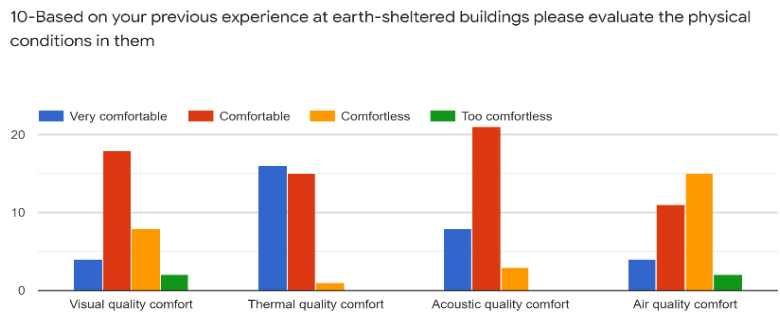


Figure 13: Result of the survey about the approach to comfort condition based on experience.

Approach of Examples

The existence of modern Earth-sheltered structures can lead to more knowledge and help to break down bias has been mentioned in the literature (Hassan, 2016). After evaluating the participants' opinions without examples, the survey supplied modern examples and questioned about building physics comfort conditions hypothetical.

The participants were asked Aloni House is comfortable in physical conditions or not with reference from figure 4. As mentioned Aloni house included five courtyard and it can be related with cross-section type A. Even though most people consider type A to be "not a suitable site," the Aloni house is associated with being very comfortable and comfortable by the majority of the participants, as seen in figure 14.

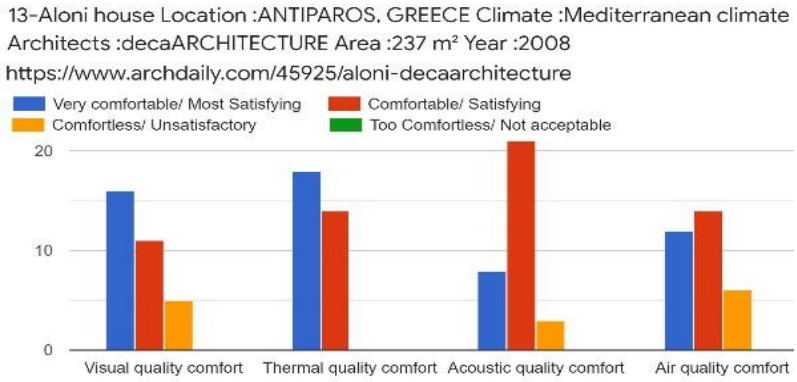


Figure 14: Result of the survey about approach to the Aloni House

As shown in the bar chart (fig 14), the Aloni house visual quality is evaluated as having; very comfortable by half of the candidates and comfortable by more than one-third of participants, a minor amount of people consider comfortless. The thermal quality condition of it is assessed as very comfortable by over half of the candidates and comfortable by the rest of the participants. Two-third of the candidate's rate its acoustical qualities as comfortable, and except for a very small part, the remaining candidates are evaluated as very comfortable. Last environmental comfort condition air quality is founded comfortable and very comfortable by almost the same rate amount of people. Just %16 of the people rate as comfortless it.

While the bar chart shows Aloni house is comfortable, the following table compares the thoughts created by the Earth shelter house and the reactions of the Aloni house on participants. This table shows under which comfort conditions the Aloni house changed the thoughts of the participants. As shown in Table 2, visual quality comfort and air quality comfort conditions get better in participants' minds and thermal comfort condition is voted a little more.

	Visual quality comfort				Thermal quality comfort				Acustical quality comfort				Air quality comfort			
	Very comfort able	Comfort able	Comfortl ess	Too Comfortl ess	Very comfort able	Comfort able	Comfortl ess	Too Comfortl ess	Very comfort able	Comfort able	Comfortl ess	Too Comfortl ess	Very comfort able	Comfort able	Comfortl ess	Too Comfortl ess
Hypotethical own experience	4	18	8	2	16	15	1		8	21	3		4	11	15	2
Aloni hause	16	11	5		18	14			8	21	3		12	14	6	
Difference =	12	-7	3	2	2	-1	1		0	0	0		8	3	9	2
	Break bias				Break Bias				Neutral				Break bias			

Table 2. Result of the survey between approaches to the Aloni House and own experiences

The other example is Sau Central Library which is also a type of courtyard cross-sections (fig.14).The participants evaluated the building as the shown picture in figure 15. As shown on the bar chart in figure 16, most of the candidates considered the underground library as being “comfortable/satisfying” in all environmental conditions.

There are some handicaps in human attitudes towards function. People's attitudes towards non-residential building functions may be different. The library can be one of them. Even the fact that one of the most important advantages of earth-sheltered building features is having a natural barrier to environmental noise, almost a quarter of participants vote this library hasn’t acoustical comfort.

Figure 15: The pictures of the Auth Central Library (SAU) in the survey.

This example did not produce results like the housing example. As seen in the table 3 the participants voted the earth shelter structure for the library as more uncomfortable, except for the air quality, from their own deductions about the idea of earth-sheltered cell.

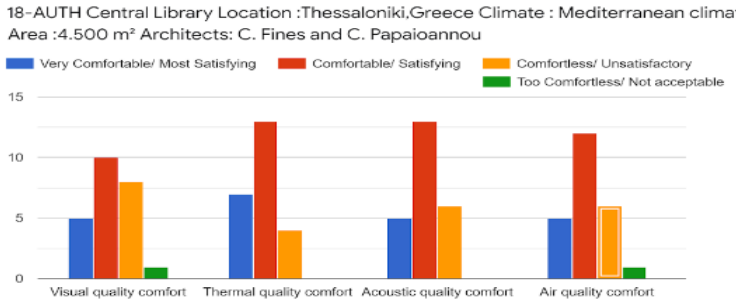


Figure 16: Result of the survey about approach to the Auth Central Library

	Visual quality comfort				Thermal quality comfort				Acustical quality comfort				Air quality comfort			
	Very comfortable	Comfortable	Comfortless	Too Comfortless	Very comfortable	Comfortable	Comfortless	Too Comfortless	Very comfortable	Comfortable	Comfortless	Too Comfortless	Very comfortable	Comfortable	Comfortless	Too Comfortless
Hypotethical own experience	4	18	8	2	16	15	1		8	21	3		4	11	15	2
Sau Library	7	14	10	1	9	18	4	1	6	18	8		8	16	7	1
Difference =	3	-4	-2	1	-7	3	-3	-1	-2	-3	-5		4	5	8	1
	Nautral				Bias				Bias				Break bias			

Table 2: Comparison of library-based results and conditions based on experience results.

CONCLUSION

The fact that such structures, which have been used since the history of humanity, are suitable for human habitat, is evident by their use by people for many generations. But this fact is not sufficient to break the biased against underground architecture. In the survey conducted in this study, it was determined that people close to the field of architecture were aware of such structures, but it was also observed that the subjects did not experience earth sheltered building, and while they were more negative in the section typologies given they approached more positively in modern earth-sheltered buildings. It is observed that the examples can break the bias about Earth-sheltered structures, especially the prejudgments about visual and air quality comfort conditions.

There is a big change in the positive direction, especially in the consideration of air quality comfort about underground library. The function of building maybe can cause confusion the participants mind. It is surprisingly the other comfort condition such thermal quality and acoustical comfort about library rated lower than their own deductions about the idea of earth-sheltered habitation.

The participants in this survey are close the idea of earth-sheltered habitation at housing but not for other functions.

REFERENCES

Anselm, A. J. (2012). Earth Shelters; A Review of Energy Conservation Properties in Earth Sheltered Housing. In A. Z. Ahmed, & I. f. Technologies, Energy Conservation (p. 125). Maastricht, Netherlands: INTECH.

architektur, v. (2014). erdhaus. Retrieved from erdhaus: http://www.erdhaus.ch/peter-vetsch.html

Buchwitz, M. (2013, August 8). researchgate. Retrieved January 9, 2020, from researchgate.net: https://www.researchgate.net/post/Is_the_1800_to_2000_increase_in_global_human_population_linked_to_the_successes_of_medicine_and_hygienic_measures

Gray, J. (2019, December 4). Underground Construction in sustainablebuild. Retrieved from sustainablebuild: http://www.sustainablebuild.co.uk/ConstructionUnderground.html

Hassan, H. S.-K. (2016). Measuring people's perception towards Earth-sheltered buildings using photo-questionnaire survey. Sustainable Cities and Society, 26, 76-90.

Kotsiopoulos, A. M. (2010, April 18). New building for the Main Library, Aristotle University of Thessaloniki. Retrieved from Greek architects: https://www.greekarchitects.gr/en/hommages/%CE%B1%CE%BC-kotsiopoulos-partners-architects-id2025

Low impact. (2020, January 20). lowimpact.org. Retrieved from Lowimpact is a workers' co-operative: https://www.lowimpact.org/lowimpact-topic/earth-sheltered-houses/

McConkey, R. (2011). The Complete Guide to Building Affordable Earth-Sheltered Homes: Everything You Need to Know Explained Simply. Ocala, Florida: Atlantic Publishing Company.

Nash, K. (2015, April 21). BBC. Retrieved from BBC Web Site: https://www.bbc.com/future/article/20150421-will-we-ever-live-underground

Richards, M. (2009, October 11). Extreme Town Coober Pedy. (E. t.-T. channels, Interviewer)

Therman, M. R. (2012). Earth Sheltered Housing Principles in Practice. New York: Springer Verlag.

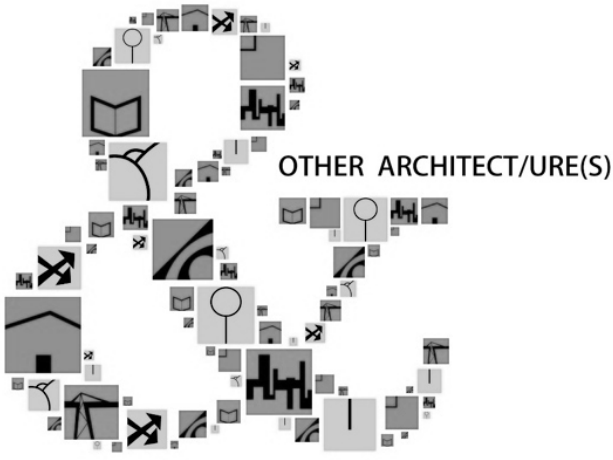
worldbank. (2020, April 20). worldbank. Retrieved from worldbank: https://www.worldbank.org/en/topic/urbandevelopment/overview

LIVENARCH **VII**
livable environments & architecture

PART IV

PHILOSOPHY / THEORY / HISTORY / DISCOURSE

LIVENARCH VII
livable environments & architecture



7th International Congress
September 28-30 2021 Trabzon TURKEY

LIVENARCH **VII**
livable environments & architecture

IMAGINED SPACES OF THIS WORLD: THE OTHER ARCHITECTURE(S)

Türkan Nihan HACIÖMEROĞLU[1]

[1]*Eskisehir Osmangazi University, Turkey*
nihanhaci@gmail.com

ABSTRACT

In fiction, as well as non-fiction literature, architecture is an integral part of the narrative. However, the adaptation of the narrative concept to architecture is relatively new, and studies on architectural narrative are still further away from central discussions. Since literature is a great source for both central and peripheral discussions, this paper aims to unearth and study fiction genre, including fantasy and science fiction, and analyse the relationship between imagined spaces and "other" architectures as opposed to built environments and the architecture of the centre. By analysing the specified group of imagined and narrated spaces that are presented in *The Dictionary of Imaginary Places*, this paper examines and presents what these narrated spaces and other architectures can bring to the discussions of architectural discourse; which concepts and values can be questioned, enriched and expanded, thus create a new periphery for architects. In order to achieve that, the places in *The Dictionary of Imaginary Places* are analysed in four steps: selection and grouping of places, analyses based on properties of texts, the relevance of narratives to architecture, and the properties of architectural narratives. Finally, the outcomes of the analyses are grouped into three and discussed within the context.

Key Words: Architectural Narrative; Imagined Spaces; Literature; Architectural Narrative Model.

INTRODUCTION

In 1980 Alberto Manguel and Gianni Guadalupi published *The Dictionary of Imaginary Places*. [1] They intended to create a guidebook for the fictional places in the literature they would like to visit. They treated the fictional places as real and limited the list to the ones on earth, either in its present or past times. So extra-terrestrial places and future imaginations were excluded from the book. Even with such limitations, they had to eliminate further places to control the content's size, which turned into a book of about 700 pages in the end, after the additions made in 1987 and 1999. Imagined spaces of Ursula K. Le Guin, J.R.R. Tolkien, Daniel Defoe, and many other authors found their way to the collection. From Emerald City of *Wizard of Oz* to Gondor in Middle Earth, from Camelot to Kafka's castle many familiar, yet non-existent places make appearances in the book's pages. In the end, the book turned into a great source for 'the world within the world'; and one of the ultimate guides to other architecture(s), which are imagined and narrated but never realised. The architecture that builds worlds but is not noticed or discussed. The alternative that creates spaces for any kind of user and yet is not part of the architectural theory of the centre. As imaginary as they are, they are all other places, spaces, and architecture of this world even though they are neatly kept in the furthest part of the periphery.

In fiction, as well as non-fiction literature, architecture is an integral part of the narrative. This book allows unearthing and studying a specified group —fiction, including fantasy and science fiction in this case— and analyse the relationship between imagined spaces and "other" architectures as opposed to built environments and the architecture of the centre. By analysing the specified group of imagined and narrated spaces that are presented in *The Dictionary of Imaginary Places*, this paper examines and presents what these narrated spaces and other architectures can bring to the discussions of architectural discourse; which concepts and values can be questioned, enriched and expanded, thus create a new periphery for architects.

It should be noted that this study is limited to the data written in *The Dictionary of Imaginary Places* only. Even though the places and spaces mentioned in the book might be significant elements in their narratives, better and more richly described or defined, since it is not possible to analyse all of these literary works, it is decided to work with the information written as they are mentioned above.

Analyses Of The Narrative Works

In this study, there are several steps taken in order to analyse the narrative works. The first step of the study is the selection and grouping of the places/spaces/architectures included in the dictionary. The scales and properties of these places vary: from caves to hills and mountains, from houses to towers and castles, from small villages to cities, and from countries to islands and continents find a place in the dictionary. Their properties also vary depending on the narrative. Most of them are defined by a couple of sentences, with various details and some information about

how natives live there. Some are quite detailed such as Minas Tirith and Gondor in J.R.R. Tolkien's *The Hobbit or There and Back Again* (1937) *The Lord of the Rings Trilogy* (1954,1955) and *Silmarrillion* (1977) or as Erewhon from Samuel Butler's *Erewhon* (1872) and *Erewhon Revisited* (1901). Unfortunately, some have very few details and are defined with a couple of descriptive/non-descriptive sentences. Therefore, to make a noteworthy analysis, the places in the dictionary are selected based on pre-determined criteria, including scale, function, the context of the narrative, and the amount/quality of detail given about spaces. This process not only gives an insight into the possible selection criteria of the authors Manguel and Guadalupi but also helps specify the prominent features of these imagined places/spaces/architectures such as social-political and economic life, usage, environmental data, urban areas, natural environment, production, material, and construction techniques.

Based on this first analysis, the places are divided into two groups. Natural places and man-made places. These two groups also have subgroups based on their scales. "Natural places" mentioned in the book are oceans, continents, seas, archipelagos, chains of mountains, islands, mountains, volcanos, valleys, rivers, lakes, plateaus, forests, meadows, swamps, riverbanks, marshy areas, rocks, capes, caves, edges, navel, and peaks. Some places do not have very clear definitions, such as a vast stretch of water and drifting piece of land. The second group, "man-made," is divided into five subgroups based on scale with some ambiguity since it is not always easy to define the scales of written places. For example, while an empire might refer to a large area and a grand duchy to a smaller area, an unidentified country might be bigger than an empire or smaller than a grand duchy. The subgroups are also divided by their (assumed) properties of architecture. Five subgroups for "man-made" are 1) Large man-made places include places such as empires, underwater countries, flying islands, and commonwealths. 2) Medium man-made places include places such as duchies, settlements, and open-pit mines. 3) Small man-made places include places such as a theme parks, canals, tidal pools, and barrows. 4) Large architectural structures are more defined with their architectural properties. This group contains spaces such as palaces, penitentiaries, sanatoriums, and subterranean galleries. 5) Small / Single architectural structures include mansions, theatres, grottos, towers, and graves.

It should be noted that as much as these groups can be separated from each other based on their way of creation, there are many examples that these groups intersect. In the dictionary, almost thirty percentages of the places are islands. As much as they refer to geographical formations, throughout the narratives, they also refer to settlements, countries, republic, etc. Also, terms such as duchy, empire, kingdom, and republic do not give any information about their geographical or architectural properties. So they may very well be islands, valleys and or marshy areas.

In the second step, places are analysed based on different properties of narrative such as the amount of detail, the type of information given, relevance to architecture, and the type of visual materials.

Most of the places in the book are described with approximately 150-300 words such as Arnheim from *The Domain of Arnheim Philadelphia* by Edgar Allen Poe or Morrow Island from *La Cité de Isoles* from Henri Chateau. However, there are some exceptions, either too short or a lot longer than this count. For example the text for Mummelsee from *Der Abenteuerliche Smiplicissimus Teutsch* from Johann Hans Jakop Christoffel von Grimmelshausen is 84 words, Upper Morven from *Figures of Earth: A Comedy of Appearances from James Branch Cabell* is 39 words and Meipe from *Meipe ou La Délivrance* (1929) from André Maurois is 26 words only. On the other hand, Thomas More's *Utopia* (1516) is approximately 5200 words spreading through almost eleven pages with three illustrations, which are a map, and illustrated perspective of a garden in capital city Amaurote, and an illustration of cups and tableware. Bensalem from *New Atlantis* (1627) by Francis Bacon, and from *An Unknown Land* (1942) from Viscount Herbert Louis Samuel, is approximately 4000 words spreading through eight pages with one illustration.

Most of the illustrations are plans and site plans. Scales vary depending on the place. There are also illustrations of details, interiors, statues, ornaments, objects and axonometric drawings of specific spaces. Not all places have illustrations.

Besides the amount words written, the information given in these texts also changes. While some texts are more descriptive about the life at these places giving general information, some texts are more related to the events. Such as for Terrabil Castle from *Le Monte Darthur* (1485) by Sir Thomas Malory, there are no descriptive information about the castle but a short information about what happened there, which includes the besiegement of the castle by Uther Pendragon, the death of Duke of Tintagel, and his wife giving birth to Uther Pendragon's famous son King Arthur. On the other hand, the text of Pal-Ul-Don from Edgar Rice Burroughs's *Tarzan the Terrible* (1921) covers the location of the place, what it is surrounded with, detailed information about the layout of the city A-lur, and architecture of the Temple of Gyrf, who lives in this kingdom and concise information about the language. In longer texts, descriptive informations are mainly supported by important events and characters.

The descriptive texts include (rarely all at once and not necessarily in this order) natives and locals (may or may not be human beings, animals, and creatures), polity and governance (if exists), rules and regulations, social life, daily life, history, politics, believes, language (and its roots), traditions and customs, tools and gadgets, ceremonies (marriage, death, punishment, and celebrations), economy and trade, relations between genders, locals, neighbours, tourists, foreign policies (neighbouring cities, and countries), notable characters of the narrative and the place, important events, attachments, fashion. As for spaces; location of the place, geographical information (island, mountain, under sea, and under ground), climate and environmental data, layout of the city, town, and settlement; (if mentioned) zones, regions, street and layouts, important buildings (where it is located, architectural styles, shape and size, façade features, its relevance to the place and the narrative), building functions, building techniques and

materials such as valuable precious stones, (gold, pearl, etc.) such as El Dorado from many different novels including Sir Walter Raleigh's *The Discoverie of the lovlie* and Emerald City from *The Wonderful Wizard of Oz* by L. Frank Baum (1900), colours and natural phenomena and state of being a "place". There are also some places, which are not very easy to categorize or define. For example, Flatland from *Flatland* (1884) by Edwin A. Abbott is a land where everything appears as straight lines. [2]

All these features are rarely mentioned in one text at once, but in many narratives, at least a couple of these features appear together to create a place in readers' minds. Authors explain at the foreword that they hint at the reasons for their selections in the texts, but sometimes they choose some places just for the excitement in the hopes of being able to be there one day.

In the third step, their relevance to architecture is analysed. There are four different approaches in the narratives.

In the first approach, architecture is used mainly as background imagery, a minor tool for the narrative. The details given about these places rarely refer to specific spaces or architecture. For example, in the dictionary about Feneralia from *Riallaro, the Archipelago of Exiles* (1903) by Godfrey Sweven, there is short information about who lives there and how they earn their living, which is related to the bare state of the island. However, there is almost no information about the island itself.

In the second approach, the architecture is still used as a tool for the narrative but has a more substantial presence. For example, Minas Tirith from *Lord of Rings Trilogy* and *The Silmarillion* (1954-55, 1977) by J.R.R. Tolkien is described in detail and highlighted as being the location of several important events. [3-4]

In the third approach, architectural spaces are one of the essential elements of the narrative. They either appear as a character or one of the causes of significant events. The Castle from *Das Schloss (The Castle)* (1926) by Franz Kafta [5] or the Abbey from *Il Nome della Rosa* (1980) by Umberto Eco [6] are as important as characters and take part in crucial moments leading to critical events. Without these spaces, it is not possible to create a story. Similarly, Laputa from *Travels into Several Remote Nations of the World, In Four Parts By Samuel Gulliver, First a Surgeon, and then a Captain of several Ships* (1726) by Jonathan Swift, which is a flying island, [7] or Malacovia, an iron castle under water from *Pedali sul Mar Nero* (1884) by Amedeo Tosetti [8] are important elements of the narrative. At Gormenghast Castle from Mervyn Peake's *Titus Groan* (1946), *Gormenghast* (1950) and *Titus Alone* (1959) each mini-story is created by its own space (most a wing in the castle) and as a whole the castle creates the main narrative. [9-10-11]

In the fourth approach, architectural spaces are the main topic of the narratives. Most known example is the cities from *Le Città Invisibili* (Invisible Cities) (1972) by Italo Calvino: Aglaura, Anastasia, Argia, Baucis, Bersabea, Despina, Ersilia, Eudossia, Eusapia, Fillide, Isaura, Leonia, Moriana, Octavia, Perinzia, Tecla, Teodora, Valdrada, Zemrude, Zenobia. [12] Each

of them is a framework for discussions on memory, place, civilization, and criticism against modern architecture and urbanism. Similarly, in Jules Verne's *Les 500 Millions de la Bégum (The Begum's Fortune)* (1879), a part of the narrative stands upon the construction of France-ville and the ideals of society behind it. [13] While Meccania from *Meccania, the Super-State* (1918) by Gregory Owen [14] and Ibansk from *Ziyayushchie Vysoty* (1976) by Aleksandr Zinoviev [15] offers solid imageries, Flatland from *Flatland* (1884) by Edwin A. Abbott hosts more intangible imagery.

In the fourth step, the architectural narratives are analysed based on the architectural properties of the narratives. Do the narratives mention single structures or general planning or schema of a city? What kind of imagery do they create? What is the purpose of architectural elements in the narrative? How is architecture represented; based on the architectural style of its era, based on an idea, based on a concept, based on material, based on its iconic properties, based on its function, or narrative value? How are they connected to the users, functions, materials, and time?

For some of the questions, an analysis model for reading architectural narrative, which the author constructed, is used as a comparable analytic template. [16] The model uses many criteria, including but not limited to function, scale, location, usage properties, usage density, spatial-temporal-narrative continuities, architectural space and time relationship. For this study, the model is modified based on the group it is applied to. Since each group and example have their properties and narrative and spatial values, not every example is subjected to all criteria. Therefore outcomes also vary. Some architectural spaces such as Gormenghast from Mervyn Peake's *Titus Groan* (1946), *Gormenghast* (1950) and *Titus Alone* (1959) is given in great detail including social and political life, arts and crafts, material and spatial properties and natives usage of these spaces, allows application of most of the criteria while the Dainty China Country from L. Frank Baum's *The Wonderful Wizard of Oz* (1900), where all the people, animals, and buildings are made of Chinese ceramics, aka china, can be subjected to fewer criteria based on the narrative. [17]

There are many different approaches to architecture in the books and individual narratives. There are mirror images and styles of the real world reflected in the narratives depending on their time of creation (written or designed) or narrative time line. Many of the earlier works (before the 20th century) refer to many period styles, architectural elements, site plans, and costumes. Cities are "entered" through gates; functions of architectural and urban elements reflect its time. There are also novel approaches, creative materials, multifunctional or moving architectural spaces, and mostly inspirational and adventurous locations such as under ground and under water.

Findings and Questions

The findings of the above-mentioned analyses can be divided into three groups; documentation of specific periods' approach to city and architecture, confirmation of current/past perspectives and processes, and questioning of norms through the possibilities of "others".

Documentations mainly include the architectural spaces of ideals and practices of specific periods in time, either the time of the original work or the narrative time line. It can be seen in the attachment to certain architectural elements, styles or functions for the sake of imagery, such as columns, facades, city gates, towers, and building styles.

Confirmation is related to the reception of different concepts in different periods: changes in the perception of beauty, aesthetics, richness, culture, collective memory, etc. It also embraces the constantly discussed subject such as the relation between place and space, architecture as an image, understanding of space by visual elements such as maps and plans, context and architecture, movement-time-space relations and elements of urban design.

Questioning creates new possibilities derived from "other" architectures. Some of them are questions, which are not new to architectural discussions but still their distance to the "centre" lessens their effects. Some of them are only statements. The questions are formed afterwards. Potentials of alternative locations: why limit human settlements to the surface? Limitless potentials of architecture that exists in mind only. Does the narrative value of a space significant? The life span of spaces is measurable. Why not design what comes after? Architecture without context: what are the requirements? Blurred borders of cities: Is there a need to enter the city through a gate? Tower and its place in architectural narrative Time and space; alternative temporal relations create new potentials. Movement and architecture in connection to interchangeable spaces: why shouldn't spaces move as much as users? Places of attachment. Power of space over users: Space as the manipulator of time and movement. What are the limits of the ideals behind spatial development? Can the potential of change start with materials? Architecture's connection to light: Is it unbreakable? Space in the eye of the beholder. Where does architecture end? Façade as a border between possibilities and reality. Infinity in architecture and limitations on scale. What are the rights of living beings other than humans? Architecture as part of the city: what are the other elements?

As a result, the unbounded courage and creativity of these imaginary spaces bring new questions, concepts, and values to architectural discourse and the theory of the centre. What if some of these questions are asked, values are applied, and concepts are discussed without prejudice? What could change in architectural theory and history?

CONCLUSION

One of the first things necessary to discuss when analysing *The Dictionary of Imaginary Places* is understanding what "place" embodies. It is a geographical term as well as a complex formation that connects time, space, user, and actions. A place reflects the strong bond between space and user, the actions taken place in time, and the creation of experiences and attachments. While Norberg-Schulz defines it as "existential space" [18], Pallasmaa emphasises the use of senses to connect humans and the environment. [19] The concept of place in architecture is not new, but it is a strong reminder for architects to design spaces that can create a bond instead of just "imagery" of empty shells.

What makes a space a place? Besides all of the answers given to this question, based on this study it is possible to say the narrative value of space can create a place within the space.

Many different narratives in the book show that a city is a lot more than just physical elements. Politics, daily lives, believes, traditions, culture, natural elements, life forms, and many other elements come together to form different kinds of settlements. While architects tend to limit their vision to the periphery of the construction area, urban designers prefer to approach cities as a whole. Carmona et al. put forth six dimensions of urban design: perceptual, visual, functional, social, temporal and morphological. [20] Designing architectural spaces with these dimensions in mind both for architectural and urban scales would create holistic spaces.

In relation to that, architecture's approach to user friendly spaces can widen to include all living things: humans, animals, and plants. It is a relatively new concept to design for all. Recent works on biophilic architecture supported with sustainability is a good step towards more inclusive and healthy spaces.

Analyses also show that in the book, there are several different temporal relations between space and user.

Temporal relations with space usage in time: In different narratives, some places have a different passage of time. As much as that is not possible in real life, it is still necessary to question our assumptions. Spaces have the power to change people's psychology and biology concerning health issues especially.

The life span of a building and what will happen when it comes to its end: The life span of a building is mainly measured with its material and construction integrity and function adaptability. Architecture plans and design according to these issues, but the end of the design is rarely foreseen or planned. So what will happen when an architectural space runs its course? Will it be dismantled, destroyed, left to ruin or repurposed/reused with renovations? Especially in cities, the demise of space affects the surroundings not only visually but also economically and physically.

Changing space in time and based on usage: In some narratives, spaces can change instantaneously based on the number of users, the actions or time of the day, or the month of the season. In others, there are specific spaces to be used at a particular time of day, or a year, or a season. For many reasons especially economic and physical necessities architects optimize design choices and the usage of single spaces. As much as it is not expected from architects to create such specific spaces (except for certain functions) the technology of today allows us to search more in our spaces, try novelties, movements (more than modular or sustainable reasons)

Perception and space: A space is not a rigid, absolute truth. It should leave the user a chance to connect, to make discoveries, to personalize these spaces. Physical changes may not be feasible, but current technologies offer new (virtual) platforms to create limitless spaces. Spaces turn into places in the eye and mind of the holder.

Optimizing designs also affects the choice of locations. Recent studies work on the possibilities of living under ground, under water, high above the ground, in space etc. Architecture should not be reluctant to let go of the standards and basic assumptions such as gravity, necessities and limits of the human body when the technology allows us new living areas other than earth's lands. New living places also come with new ways of living, thinking, and actions.

This study shows that the architectural narratives of fiction works are a great source for the discussions on “other” architectures. There are many undiscussed statements and questions left. It may not be possible to discuss all of them at once. Nevertheless, in time each can have a chance to get closer to the centre and widen the periphery of the discussions.

REFERENCES

[1] Manguel, A.& Guadalupi, G. (1980,1999). The dictionary of imaginary places (newly updated and expanded edition). London, England: Harcourt Brace & Company

[2] Abbott, E.A. (1884). Flatland:A romance of many dimensions. London, England: Seeley & Co.

[3] Tolkien, J.R.R. (1954-1955). The lord of rings. Boston, USA: Houghton Mifflin

[4] Tolkien, J.R.R. (1977). The silmarillion. Boston, USA: Houghton Mifflin

[5] Kafka, F. (1926). Das schloss. Munich, Germany: Kurt Wolff Verlag

[6] Eco, U. (1980). Il nome della rosa. Milan, Italy: Bompiani

[7] Swift, J. (1726). Travels into several remote nations of the world, in four parts by Samuel Gulliver, first a surgeon, and then a captain of several ships. London, England: B. Motte

[8] Tosetti, A. (1884). Pedali sul Mar Nero. (n.p.).

[9] Peake, M. (1946). Titus Groan. London, England: Eyre & Spottiswoode

[10] Peake, M. (1950). Gormenghast. London, England: Eyre & Spottiswoode

[11] Peake, M. (1959). Titus Alone. London, England: Eyre & Spottiswoode

[12] Calvino, I. (1972). Le città invisibili. Torino: Einaudi

[13] Verne, J. (1879). Les 500 millions de la Bégum. France: Pierre-Jules Hetzel

[14] Owen, G. (1918). Meccania, the Super-State. London, England: Methuen & Co. Ltd.

[15] Zinoviev, A. (1976). Ziyayushchie Vysoty. Lausanne, Switzerland: L'Age d'Homme

[16] Hacıömeroğlu, T.N. (2015). The Transformation of Architectural Narrative from Literature to Cinema: Differences, Continuities and Limits of Representation in Different Media (unpublished doctoral dissertation). METU, Ankara, Turkey

[17] Baum, L.F. (1900). The Wonderful Wizard of Oz. Chicago, USA: G.M. Hill Co.

[18] Norberg-Schulz, C. (1971). Existence Space & Architecture. New York, USA: Praeger Publishers

[19] Perez-Gomez, A., Pallasmaa, J., & Holl, S. (2006). Questions of Perception-Phenomenology of Architecture. San Francisco, USA: William Stout Publishers

[20] Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2003). Urban Spaces-Public Places: The Dimensions of Urban Design. Oxford, England: Architectural Press

"DETERMINATION TO SPEECH, SPEECH TO POLICY - THE ISSUE OF ARCHITECTURAL POLICY AT THE JOURNAL OF "ARKITEKT" AND "MIMARLIK" IN 1940-2005"

Hasan Tahsin SELÇUK[1]

[1]*Ondokuz Mayıs University, Turkey*
htselcuk@gmail.com/ hasan.selcuk@omu.edu.tr

Politics/ Policies/ Laws/ Regulations/ Ethics

Human/ Behavior

Technology/ Material/ Sustainability

Philosophy/ Theory/ History/ Discourse

Criticism/ Method

Identity/ Culture/ Tradition

Urban/ City/ Landscape/ Rural

Design

Interior Design

Conservation/ Transformation/ Re-use

Education

Arts/ Aesthetics

ABSTRACT

E. Laclau and C. Mouffe stated that it would not be correct to distinguish between the linguistic and behavioral aspects of a social practice. In this context, reality/meaning is made visible only by the articulation of discourse and praxis. Architecture, which is the subject of texts written in architecture journals; articulation of product, actor and discourse is performed as a practice of establishing a relationship between elements. In this context, discourse is this semantic structure as a product of heterogeneous and selective articulation. (Laclau & Mouffe, s. 132)

Discourses produce their own reality. After all, it is essentially language-constructed realities that are expressed as social interests. (Eagleton, 2005, s. 288-289) In this context, what is represented is never a solid reality, but something shaped by the act of representing. The reality that each medium represents has unique sensitivities and priorities.

This study has compiled the discourse and policies of "*Arkitekt*" and "*Mimarlık*" publications in the linguistic medium, regarding Turkish Architecture, by examining the content of their publications. For this reason, I expanded my study of the 1986-2005 period publications of the TMMOB "*Mimarlık*" magazine, which I had prepared before, by examining the publications of the "*Arkitekt*" magazine starting from 1940 and the "*Mimarlık*" magazine starting from 1963. I wanted to summarize the historical accumulation by bringing together the discussion titles, discourses and policy suggestions in the magazines. This study synthesized the policies on the subject of Turkish architecture, based on the agenda, determinations and discourses on Turkish Architecture.

Key Words : Architectural Policy; Architectural Journals; Journal of *Arkitekt*; Journal of *Mimarlık*; Discourse Synthesis.

INTRODUCTION

The necessity of performing architectural services in Turkey in accordance with a policy began to be voiced by the architects in the country in the early periods of the Republic. The subject was brought up for the first time in 1940 with the article “Türk Yüksek Mimar Odaları teşkiline doğru” published in Arkitekt magazine. However, the preparatory work for the Policy text started in 2005 with the discourse of “Türkiye Mimarlık Politikasına Doğru”.

“ARKITEKT” JOURNAL

In the first issues of Arkitekt magazine, which started publication in 1931, current trends in architecture in the west, masterful practices and design ideas were introduced. In terms of the promotion of the architectural profession, the recognition of Turkish architecture and our architects, these publications, in the words of M.Önal, "have been encouraging and impressive on the administrators of national institutions, especially provincial municipalities." (Önal, 1973-111)

In the early 1940s, discourses and texts were written to develop the country within its own internal dynamics and with its own culture, due to the enthusiasm of the Republic, the war environment and the closure of countries. (Eldem, 1939) (Eldem S. , 1940) (Moraş, 1941) (Sayar, 1941) In this context, national architectural movements in Europe and America were discussed in the issues of the magazine on the eve of 1940, and suggestions were made to discover and perform our own architecture. (Anonim, 1938) Since developing national architecture also means the construction of our own cities, translated texts from international publications on urbanization and urbanism were included in almost every issue of the magazine in the 1940s. In the following years, it is seen that the texts on urbanism decreased even after 1960, while the subjects of municipality and Istanbul were handled with an increasing intensity as the years progressed. The zoning problems that arise with urbanization and especially the phenomenon of slums are important factors in this.

The *Arkitekt* magazine, in the mid-1950s, the designs of Turkish architects working abroad, large projects that made an international impression, and hotel buildings; Starting from the mid 60's, the structures of the architects in Turkey; By the 1970s, tourism investments and touristic building projects, which are an important work area for the construction and architecture sector, were included in the preparation of the 'tourism development plan' and regional plans. (Sayar, Turizm Politikamızın Çeşitli Problemleri Arasında Ön Planı İşgal Eden Bir Konu : Hotel, 1970) In addition, with the introduction of freelance architects and architectural works in Turkey in the 70s, architectural issues that took place in the agenda of Turkey were included.

Policy - Organization

Due to the construction sector, which stopped during the "World War II" period, the housing problem started. The state was expected to solve this problem by putting forward a planned policy. But the organization to do this was not formed. The state formed a "yüksek fen heyeti" on housing and zoning in 1936, but it could not make it work. It was demanded that this committee be made to work properly, that a construction congress was convened and that the issues related to construction and building activities in the country were determined and content, and necessary organization and actions were taken. In this regard, the "Türk Yüksek Mimarlar Birliği" made a request to the Nafia Vekaleti (power of attorney) in 1944. In 1945, commissions were established by the Nafia Vekaleti. The first meeting was held in 1948 with the name "1. Yapı Kongresi", and the second was held only in 1955 with the name of "İmar Kongresi". This development is the most important development that architects have gone through from detection to discourse, and which has emerged as a professional policy.

As a professional policy, the first issue mentioned in the magazine was the draft law prepared by the architects regarding the establishment of the Yüksek Mimarlar Birliği, which was submitted to the Ministry of Nafia Vekaleti. The content of this work was the desire to establish a legal structure in the eyes of the public in order to create a working order in their own fields in the country, where the architects would share their knowledge and experience. (Anonim, Türk Yüksek Mimar Odaları Teşkiline doğru, 1940) Because almost every administrator was involved in the architect's work. (Sayar, İdareciler ve Mimarlar , 1946) The formation and expression of this demand paved the way for architects to develop a self-confidence and policy for the problems and execution of the profession. (Sayar, Yapı ve İmar Politikamız Var Mıdır?, 1943) As a professional organization in the field of zoning, a will has developed that they should take responsibility and produce policies in cooperation with state institutions. (Sayar, 1 inci Türk Yapı Kongresinden Beklediklerimiz, 1948) In this direction, in the annual meeting organized by the Union of Turkish Master of Architects in 1946, the aim was to hold the Building Congress, to have at least one architect working in each city center, to establish a cooperation organization between architects, and to insure all members against accident and death.

Work of the "Birinci Yapı Kongresi" started in 1944. The minimum expectation from the Congress was to assign private office engineers and architects to the state organization, to make the " Yüksek Fen Kurulu" operational and to authorize the subjects of Architecture and to enact the Chambers Law. After the first building congress in 1948, positive developments were observed such as the enactment of the “Bina Yapım Teşvik Kanunu”, the allocation of treasury lands to the municipalities to create housing areas, and the updating of the “Hifz-ı Sıhha Kanunu”. (Anonim, Arttırma ve Ekiltme Kanunu Bugünkü İhtiyaçları Karşılamaya Kafi Midir?, 1947) (Sayar, Mesken Buhranı ve Bina Yapımını Teşvik Kanunu, 1948) (Anonim, Ankara Belediyesine Uygun Şartlarla Tahsis ve Temlik Yetkisi Verilmesi Hakkında Kanun, , 1948) However, there was no development in the issues of lack of planning, lack of organization and

inadequacy of investment and financial instruments, establishment of relevant institutions and organizations to organize the works, which were demanded by the Yüksek Mimarlar Birliği, and which were repeatedly mentioned in many texts in the professional chamber and the magazine.

In 1954, 6235 No. “Türk Mühendis ve Mimar Odaları” were established by the law. Chamber news and studies were included in the agenda of the magazine after the mid-60s. When it comes to 1963, it is understood from the criticism that the Chamber could not show the expected functionality. (Toplum ve Mimarın Rolü, 1963) The Chamber's handling of the issues it works on within a bureaucratic mechanism and not shying away from participating in the studies, approaching the issues that need to be carried out politically (the new tender law, Istanbul Industry plan,…) with a correct attitude (Anonim, İnşaat Yatırımları, 1966) and not focusing on solving individual but common problems in the professional community experienced by architects who have primary duties (professional insurance), on the grounds that it does not give due importance to the promotion of the profession in our country, where both the public, bureaucrats and politicians ignore the architect; the Chamber was evaluated as far from being realistic and practical, away from its purpose. (Anonim, Mimarlar Odasının 1965 çalışma Programından Notlar!, 1965) For example, one of the first and most important of these was that the other parties sued the withdrawal of the work in the zoning scheme of the city, which was carried out jointly with the Istanbul Municipality and the Governor's Office. (Anonim, Mimarlar Odasının Çalışmaları Hakkında, 1964)

Industrialization moves accelerated in the country in the 1950s. However, due to the fact that industrial facilities could not find cheap and suitable land for which infrastructure was prepared, they had to delay their investments and exceed the costs they had anticipated. On the other hand, industrialization increased migration to the city, and shanty settlements were formed due to the lack of adequate housing supply. In the example of the Istanbul Municipality, the policy of postponing the problem by only showing new places to the slums that the municipality demolished due to the expropriation and demolition expenditures for the development of the city and the inability to develop the budget and opportunities to meet the housing deficit did not please anyone. (Anonim, İstanbul'un İmarı Hakkında Düşünceler!, 1957)

The deficiencies in regional and urban planning, which caused land speculation, and inadequacies in municipal services were constantly on the agenda. (Anonim, Şehrimizde Arsa Spekülasyonu, 1954) The number of slums tenfolded ten years later, in 1960, and the problem swept through cities, exponentially from year to year. (Anonim, İstanbul'un Planlanması Nasıl Yapılmalıdır?, 1963) Both the state, municipalities and banks have adopted the approach of providing housing to the public instead of the requirement to build a lot of housing for minimum needs. (Anonim, Bizde Mesken Finansmanı, 1952) In addition, the limited bank loans and high interest rates until 1953 triggered the spread of slum construction (Anonim, Yapı Kredileri, 1949), and the municipality and government had to be accepted this. In addition, the problems in the supply of building materials

and their costs have increased continuously since the beginning of the 1950s, the material became unavailable. This situation caused the construction to stop, the cost increases, and the black market has sprung up. (Sayar, Siz Karar Veriniz!, 1951) In this environment, first of all, the government had experts from the European Economic Community and experts from the United States prepare reports. (Anonim, Türkiye'de Mesken Meselesi _I, 1956) Then, with the organization of the Ministry of Public Works, a congress was held under the name of Reconstruction Congress, covering the same issues as the first Construction Congress. In this congress, the legislation for zoning institutions, financing for country development, planning of settlements and housing organization were discussed and the necessity of establishing a Ministry of Reconstruction and Settlement was communicated. Based on this, a Ministry was established in 1957 by first enacting a "İmar Kanunu", and the following year Imar Bankasi was established. (Sayar, Birkaç Mühüm Mesele, 1955) Thus, the requested organizing institution was finally established. However, it is understood from a text written in the journal on planned development in 1960 that this structuring has not yet worked properly. In the text, the difficulties encountered in the market continued to exist in the 60s as problems that became chronic as technical staff and organization and the need for building materials. (anonim, 1966)

Hotel buildings, which were mentioned in the magazine in the mid-1950s as examples of some major projects or projects by Turkish architects working abroad; Starting from the mid 60s, first the projects, then the design principles and then the tourism policies, and in the 70s, the development plan and regional plans, tourism investments and touristic building projects, which are an important field of study for the construction and architecture sector, became the main subject of the magazine. (Sayar, Turizm Politikamızın Çeşitli Problemleri Arasında Ön Planı İşgal Eden Bir Konu : Hotel, 1970)

Housing / city / Zoning

In the texts containing these topics in the journal; housing shortage, squatting, urban development and municipal problems of the city of Istanbul, and tourism construction. When we look at the content of the discourse on these, commentary articles on what is required for the market to be well organized, properly organized and systematically working, the reports presented by the experts, the transfer of the actions taken against the daily problems encountered, and the evaluation, criticism and commentary texts related to them.

With the housing shortage in the early 1940s and the formation of slum settlements; The state started the construction of civil servants' houses, and in 1946, the capital of the existing *Emlak Eytam Bank* was increased and it was restructured as *Emlak Kredi Bank*, in order to credit the activities of the private sector in this area, and it was ensured that it both gave housing loans and made housing constructions together with other banks. Thus, both public and private entrepreneurs started to produce buildings intensively. In

addition to these, Workers' Insurance (Social Insurance Institution) started to use its savings in housing, hospital and social facility construction investments for workers. . (Haberlerler, 1959)

In 1948, the national real estate and treasury lands were transferred to the municipalities with the Law No. 5218 in order to control and regulate the slum areas in Ankara. The law to encourage building construction was enacted. Simultaneously, the "Hıfz-ı Sıhha" law was amended and the health standards in the houses were increased.

Lack of organization in building production, trained intermediate staff and building materials; They were the main factors in the occurrence of blockages in the process, high building costs, very low building quality on the contrary, collapses in finished and under construction buildings. These issues were frequently discussed in the magazine in the 1950s. (Sayar, Yapı Polisi, 1951) (Sayar, Mesken Davasında teşkilat, 1952)

The seriousness of the housing problem in our country has not been taken into account. The situation reported by both the European Economic Community and the American aid delegations as a result of their studies on housing in our country and the solution proposals they presented have not been properly evaluated by the relevant bureaucracy and government officials. (Wagner, 1956) In this context, it has been criticized that municipalities and cooperatives are building houses for the upper-middle income group instead of producing cheap housing or rental houses, and the banks do not take this into account when giving loans, and the practices in Europe are presented to the reader. On the other hand, the realities of the countries put forward by the governments in cases of great distress and the palliative solutions to the problems were also reported and criticized. (Haber, 1954) (Binalarda Kat Tahdidi, 1957) For example, importing and installing prefabricated housing in earthquake-affected regions, importing prefabricated schools in Istanbul, where school problems were experiencing. (İstanbul'un Okul Dâvası, 1958)

In the 1950s of Turkey, industrial investments increased. But due to the fact that industrial facilities could not find cheap and suitable land for which infrastructure was prepared, they had to delay their investments and exceed the costs they had anticipated. On the other hand, industrialization increased migration to the city, and shanty settlements were formed due to the lack of adequate housing supply. In the example of the Istanbul Municipality, the municipality only postponed the problem by showing new places to the slums it demolished due to the expropriation and demolition expenditures for the development of the city and the inability to develop the budget and opportunities to meet the housing deficit. (Anonim, Belediye Yasağı, 1955) (Sayar, İstanbul'un İmarı Hakkında Düşünceler!, 1957)

In the journal, regional and urban planning deficiencies that cause land speculations and inadequacies in municipal services were constantly on the agenda. (Sayar, Şehrimizde Arsa Spekülasyonu!, 1954) Ten years later, in 1960, the number of slums had increased tenfold, and the problem had engulfed the cities, exponentially from year to year. (Sayar, İstanbul'un Planlanması Nasıl Yapılmalıdır?, 1963) This rapid increase and spread was

the chronic problem of the period. However, after 1955, the supply of construction materials became difficult and a black market emerged. Material prices had increased three to one in three years until 1958. (Sayar, Son Yıllarda İnşaat Azaldı, 1959) After the coup in 1960, the construction market came to a standstill. However, in 1963, market activities revived. Although this pause was welcomed because the activities in the field of zoning, urbanization and housing, which were tried to be carried out with palliative interventions and measures, would be organized with planned development studies (Sayar, Yapı ve İmarda Yeni Ruh, 1960), it caused great problems for the public due to the cessation of business in the market. In the texts of this period, the studies carried out in the articles written by the experts in the relevant planning units were introduced.

After 1960, support for housing constructions, investments and loans of the private sector decreased due to the first five-year development goals and the profitability of industrial investments, therefore, the housing shortage continued especially in the area of rental and social housing, and squatting remained the priority in the country's agenda. (Sayar, Lüks Konutlar, 1964) (Sayar, 1964 Yılında Türkiye'de İnşaat Faaliyeti!, 1965) Against this, the state has established a "residence and land office" by making arrangements in the "condominium law" and established a unit called "Land office" for the production of the zoned land and housing directly for the public. It has increased the opportunity to acquire housing with existing investment instruments. (Haber, Kat Mülkiyet Kanunu Değişecek, 1967) (Anonim, Konut ve Arsa Ofisi Tasarıları Meclis Komisyonunda Kabul Edildi, 1968)

It is learned that planning studies on zoning and settlement issues are carried out by establishing regional planning offices and by holding planning competitions. (Anonim, İstanbul Vatan Caddesi Mevzi İmar Planı Yarışması, 1967) (Haber, İstanbul Bölge Kalkınma Kongresi, 1967) In this context, tourism activities that started in the mid-1950s were given priority in the development plan, and 'tourism-based development' was adopted as a policy and an environment was created for investments by making plans, and the Ministry of Tourism was established to organize and manage these issues. (Anonim, Turizm Müesseselerine Ait Vasıflar Yönetmeliği, 1968) (Anonim, Haberler: Güney Sahillerimizde 3 Milyar Liralık Turistik Tesisler Kurulacak, , 1970)

Urbanism and Municipalism

In this title, articles on urbanization problems remaining at the intersection of zoning and policy, as well as laws and regulations, have been published. The subject of urbanism has been handled mainly with translated texts from foreign magazines.

Until 1966, his writings on urbanism, cities abroad and translated texts describing urbanism consciousness, and the disruptions and evaluations experienced in the development of the city of Istanbul created. In the translated texts, the planning and zoning activities in the big metropolises of Europe, the determination in the plan implementations and the successful results are conveyed to the reader. In the texts dealing with Istanbul, the

reasons for the disruptions in the zoning works in the city and the results that have emerged over the years, the approaches of the administrators on planning are conveyed. Particularly, there was a great reaction to the demolitions made in the city without a zoning plan. There have been publications on the need for city managers to carry out multi-faceted studies on urbanism. Applications made according to current laws and regulations are explained, planning awareness on urbanism and the results of planning problems are shown. The first text on this subject is the declaration on the history of the construction works in our country and the current forms of execution, presented at the *Nafia Bakanlığı* Works, Zoning Managers Congress in 1945. (Sayar, Şehircilik İşlerimiz, 1945) (Sayar, Harp Sonrası İmar İşleri, 1945) The declaration explains in detail our legislation on our zoning works, the way the works are carried out according to this legislations, and the necessity of applying the zoning plan as a final decision. In 1950, a law was issued for the demolition of unlicensed structures. (Anonim, Ruhsatsız Yapıların Yıktırılmasına ve 2290 Sayılı Belediye Yapı ve Yollar Kanununun 13 üncü Maddesinin Değiştirilmesine Dair Kanun , 1950) Most of the texts on Istanbul criticized the inadequacy of the laws, the lack of funding, the inadequacy of organization and the failure of the administration to execute the plan without compromise. Until this date, texts on urbanism, such as "Turkish urbanism", were published in which the plans they carried out as the historical development of local, European-American urban cultures in the cities of London, Paris, Stockholm, Berlin and current urbanism studies were published. (Türk Şehirciliği, 1950) In 1959, the UIA Urban Planning commission meeting held in Istanbul. (Anonim, U. İ. A. Şehircilik Komisyonunun İstanbul'daki Toplantısı Münasebetiyle, 1959)

Urbanism and Architecture Issues in the World

In this section, examples from abroad are presented to the readers regarding the issues on the country's agenda. In general, in the 1940s and 50s, the main issue on the architectural agenda for the whole world was housing and urbanization. The journal has published sample projects on current issues and problems in Turkey, and translations of articles from foreign publications. In this way, an opening proposal was presented regarding the current problems and developments, and he shared the current developments in Europe and the world with his readers.

The housing problem was the primary agenda of the country and the profession during the publication life of the journal. Until the tourism investments in the 1960s, it was almost the only business area for architects. In the magazine, besides the projects sent by architects from Turkey to accompany the texts on housing policy, selections from the buildings sent to the magazine by our architects living abroad were published. However, in the magazine, examples of housing projects built abroad were chosen as examples reflecting the current developments in construction technologies and the construction industry, apart from planning, and presented to the reader as examples that support the development of a multi-faceted housing policy in the country. In this context,

sample houses on the subject of housing, such as social housing, public housing, built houses, fast house construction, cheap house, portable house, ready-made house, were published in the magazine in the 1940s. Through these examples, good examples of both building industry creation and functional planning and low cost are presented. In the 1950s, examples of public housing, ready-made houses, and cheap housing, as well as apartments, rental houses, adjoining houses, modern architecture examples were published in America, England and France. Housing is also discussed in the context of new construction technologies. In addition, school and hospital projects, which formed the agenda of the country and profession, were included in this period.

In the 1960s, exemplary structures on housing were not published abroad. Only the housing fair held in Germany in 1964 was included. Apartments, detached houses and housing cooperative projects built in the country have replaced foreign examples in this regard. After the mid-1960s, in parallel with the national agenda, translated texts explaining hotel projects and their technical contents were published.

Indigenous and Local Architecture

In the early 1940s, discourses and texts were written for the purpose of developing the country within its own internal dynamics and with its own culture due to the enthusiasm of the Republic, the war environment and the introversion of the countries. (Eldem, 1939) (Eldem S. , 1940) (Moraş, 1941) (Sayar, 1941) In this context, national architectural movements in Europe and America were discussed in the issues of the journal on the eve of 1940, and suggestions were made to discover and perform our own architecture. One of the tasks undertaken by the journal was the promotion of our own architecture and our architects. In this context, the projects and designs submitted to the journal by architects operating both in the country and abroad were published. In addition to these projects, the content of the magazine includes editorials evaluating the issues on the agenda of the country and the world, original and translated texts on art history, architectural history, traditional buildings, contemporary art, construction techniques and materials, and reports on the construction industry and construction techniques and building programs. consisted of educational texts. (Sayar, 25.Yılı Bitirirken, 1955) The idea that Turkish architects would develop the architecture of their own society, culture and geography was the common vision of the architects of the period.

The fact that the market has come to a standstill under war conditions, and therefore the economic distress in the country, the expensive service received from foreign architects for the efficient use of the country's resources, and the current difficulties experienced by a small number of Turkish architects in performing their profession in the narrowed market conditions have increased the interest in the Turkish and national discourse, which is the architectural motto of the Republic. In his article on this subject, S.Hakkı Eldem analyzed the situation under seven headings. He stated that for the creation of domestic architecture, the three main working titles, user

profile, technical staff, and local conditions should be studied. Abidin Mortaş, on the other hand, stated that the expectations for domestic architecture are very high. For this purpose, he criticized the invitation of foreign architects; that architecture is developing in a medium that has international validity with the communication, transportation, technology and building materials industry; but that there is an expectation of a “national, personal and specific” architectural performance in the country; In order to establish this, he stated that it is not possible to realize the desired locality without creating industry, human development and human resources. (Eldem S., 1940) (Moraş, 1941)

Z. Sayar commented similar observations regarding the exhibition organized by the *Nafia Vekaleti* in 1943, confirming A. Mortaş; He criticized the situation with the words “The exhibition is worth attention as it expresses that we cannot give a national architectural identity to the works that took place in our twenty-year construction activities!” (Sayar, Nafia Sergisi Münasebetile, 1943)

In the title of 'indigenous architecture'; architectural project competition results, architectural conditions of Turkish architects, project designs in the context of size-program-currentness, built structures of architects, national agenda or current project designs at international level were published in the journal. Previously, the projects of the architects were published in different issues of the journal, and after the mid-1960s, the profiles in which the projects were published were published in the journal issues, together with the introduction of the architect. In addition to these, review and promotional texts on local and traditional architecture were included in the journal.

Since the journal publishes the works of the architects who submitted their articles and projects, it cannot be said that it publishes selectively or focused on specific issues in project publications. It has been seen that the diversity of building types and programs, the architect's original and innovative designs, the contest topics and results that are on the professional agenda, and the projects on the subjects of school, hospital, hotel, holiday site, residence, factory are widely published.

The diversity of building types and programs, the architect's original and innovative designs, and the competition topics and results that are on the professional agenda; Projects on school, hospital, hotel, holiday site, housing and factory have been published in the journal.

Architectural Knowledge and Education

In this topic, texts on what architecture is and its relationship with society, the content of architectural education and techniques in building types, current approaches in planning had examined. Except for news texts and student diploma projects, all texts were translations. No attitude has been observed on the subject other than raising awareness to developments in Europe and the world. There are no publications other than W.Shütte's Architect training text on the structuring of educational content in the 1940s.

In 1953, the current developments in Europe regarding the scope and content of architectural education were conveyed in another translated text, and a text translation was published from the book "Contemporary Civilizations Architect" published by UNESCO the following year.

In the 1960s and 70s, translations were published on the development of industrialization and construction techniques, especially on the principles of standardization and planning in hospital design and construction. In these years, N.Pevsner and A.Perret's texts on architecture became texts that brought intellectual diversity to the subject. Issues such as housing and environmental problems arising from urbanization, the protection of architectural heritage in abnormally growing cities, and the use of solar energy arising from the oil crisis were included in the journal.

"MIMARLIK" JOURNAL

Mimarlık journal was founded in 1963 under the management of the editorial committee formed by the board of directors of the Chamber of Architects, as "a journal that will make the voice of the community heard and follow its cases...". In the first two publication years of the magazine, the content consisted of chamber news, professional news from the world, profiles of well-known architects, the agenda of the international association of architects, the opinions and thoughts of colleagues, promotions of our cities under the title of architectural education and domestic tourism, announcements and results of the competition. The main thing in the publication was to put the magazine in a period and to inform the colleagues about the activities of the Chamber of Architects and professional law.

With the change of management after the General Assembly of the Chamber held in 1964, the issue of the practice of the profession was reflected in the journal as the priority agenda of the chamber, since the issue of permission to practice architecture for engineers was on the government agenda. This year, the journal published housing policy, studies and sample projects abroad on this subject. The editorial team assigned by the X. Chamber management elected to the task, the content of the journal; The agenda had restructured under the titles of chamber spokesperson, profession introduction, expanding the scope of writers and readers, tourism, internationalization, urbanization and housing policy, issues disrupting the construction industry, and organization of technical staff. This year, the issues covered in the magazine were the problems experienced in the performance of the profession, the problems arising from the structure of the competition juries, copyrights, general planning, vocational education, social housing and building research studies and studies in this field in Turkey.

In 1964, the general assembly of the Chamber, the execution of the profession in the context of the mission of the chamber, the expertise, the congress and studies of the UIA, and the housing issues became the main agenda of the journal. In addition, different types of settlements and building examples were presented in the journal on tourism, which was determined as the priority sector for planning and development in Turkey during the

summer months. In order to be attractive to colleagues in architectural practice, the journal has published many domestic and foreign introductions, reviews and reports on technical and theoretical issues in the context of lifelong learning, and has included current architectural projects with translated texts from professional journal publications published abroad.

In 1965, it had announced in the magazine that the publication program of the magazine was aimed at conveying the internal and external agenda, being the spokesperson of the chamber, promoting the profession, expanding its audience and internationalization. In addition, it had announced that it would present content on the general settlement and housing policy, issues that hinder the construction industry, and the organization of technical staff. In this context, the topics to be included in the publications during the year; general settlement and housing, urbanization, tourism, disruptions in the construction sector, organization of technical power, 1965 UIA Vocational Education Congress and colleagues abroad. In the journal, mainly settlement planning, problems in the sector and problems related to human resources organization had mentioned.

Looking at the content of the 1966 publication, a distinct thematic issue had covered in each issue. The themes covered the general agenda according to the months, the subject of the income tax of the members in March; with the start of the construction season, the construction investments in the country were discussed in May; and the subject of tourism had covered in terms of industry, planning and design in August. In addition, urbanization and urbanization problems unique to our country, especially the studies of the Istanbul Development Plan and texts reminding the responsibilities of the municipality had been published. (Modern Şehirlerin Gelişmesi ve Türkiye'ye Has Bazı Eğilimler, 1965)

When we look at the texts published during the year, it is seen that the main issue is the public damage caused by the fact that the state structures are not well designed, and the effort of the Chamber of Architects, together with the TMMOB, to undertake the task "to prevent harm" in this field, which yielded results. (Anonim, TMMOB'nde Güç Birliğini Saklamak Konusunda Mimarlar Odası Görüşü, 1965)In the journal, this subject has also been dealt with as "General Settlement Problems" in relation to the awareness of upper planning. (Türkiye'de Genel Yerleşme Sorunu , 1965) (İnşaat Sektörünü Aksatan Nedenlerden Biri Olarak "Genel Yerleşme Planlaması" Eksikliği, 1965) Housing issue is also a separate problem related to these general settlement problems and is a problem that the country has been experiencing heavily. In this regard, the Chamber of Architects shared its evaluations at a press conference after the General Assembly of the Chamber, and this issue was made headlines in the country's agenda. (Mimarlar Odasının Toplum Hizmetindeki Çabaları, 1965) In the journal, texts that can be defined as lifelong education related to many occupational fields were published during the year. There have been publications on architect profiles, professional knowledge, application knowledge and direct vocational training. (Turistik Tatil Köyleri , 1965) (Mimarlık Eğitimi Konusunda Bazı Mimarlık Otoritelerinin Görüşleri , 1965)

In the 1967 content of the journal, the industrialization of buildings, the 13th General Assembly, the 1967 work report, the general settlement plan and the characteristics of the housing communities, the construction materials and the manufacturing industry were discussed as themes in the issues. The "definition, registration, work distribution order" of architecture and urban planning offices has been established. (Mimarlar Odası Serbest Mimarlık ve Şehircilik Bürolarının Tanım Tescil İş Dağıtım Düzeni, 1967) In addition, an organization was established to reward student projects under the name of “Chamber of Architects Award and Exhibition” and its program, evaluation, promotion, implementation, order and principles were decided. (Mimarlar Odası Ödülü ve Sergi , 1967)

Due to the general assembly of the Chamber of Architects, problems related to settlement planning, disruptions in the sector and human resources organization had been discussed. In addition, the fact that the Ministry started to have projects done by registered offices had been an important achievement of the Chamber in this field. The Chamber shared with its readers the decisions of the Istanbul region development congress on the organization and planning of the country. Chamber criticized the results of the first 5-Year Development Plan as "unbalanced, insufficient and unplanned". (Anonim, Odanın Basın Toplantısı, 1967) For the second five-year development plan, he proposed the establishment of a "Country Organization Department", which is directly affiliated to the Prime Ministry and parallel to the State Planning Department. (Mimarlar Odası ve Ülke Düzenleme, 1967)

In the subject of Industrialization in Construction, it had been stated that it is necessary to develop traditional building methods, to develop small-scale prefabrication of structural elements with simple techniques, to train technical personnel that would allow industrialization, to establish research centers, to set standards and to provide international cooperation in all these issues. In this regard, examples from the world and studies in which traditional construction methods had modernized were conveyed.

In the 1968 publications, the structure of the content in the journals seems to had been affected by the change in management. Issues with the theme of design methods in architecture, art and photography and urbanization had published in the journal. The articles on general subjects decreased in the journal, and these had replaced by the news and explanations of the general assembly and the texts in which the attitude of the chamber on private schools had explained.

It is learned that the texts published on planning and urbanism have educational content, and a "Turkish city" proposal had presented in the "1.Milli Fiziki Plan" seminar. In addition, in the 14th Congress of the Chamber, it was proposed to establish the "Chamber of The Urban Planners". Regarding the country's agenda, building with demolition, spatial arrangement in the Bosphorus, Istanbul municipality zoning decisions had criticized and the urbanization effects of industrialization were discussed. In a text in which the situation of architects in our country is questioned, architects have been criticized for being the people who design public and

private sector investments and evaluate these projects. (Ülkemizde Mimarlar Nerede Duruyor?, 1968)

The subjects in the content created according to the 1969 study program; dormitory problems, architectural problems, chamber studies; zoning and urbanization, chamber works, cultural and natural assets and education were determined and presented.

In 1970, the concept of environment, which started to be mentioned with tourism planning and industrialization in previous years, began to be discussed in the context of air pollution and environmental problems. Ankara, Istanbul Izmir metropolitan area zoning studies and metropolitan planning. Industrialization and industrial structures. Black market on iron selling. Housing, social housing, new housing forms, low-rise high-density houses, transition from slums to social housing and architectural design education were covered in the magazine.

In the texts published on the occasion of the 10th anniversary of the journal, Maruf Önal summarized the publication process of the journal and its publication policy as of 1973; The Journal of "Architecture" stated that at the beginning it was a means of announcing the decisions of the Board of Directors of the Chamber, problems related to the profession, events and practices, but changed its content over time. In the early periods, country and society problems related to architecture were especially avoided. Social, economic and cultural problems in our country have gradually become integrated with the professional, social and economic problems of architects. Efforts to transfer labor and capital from agriculture to industry, land use order, change in demographic structure, urbanization, settlement, housing and slum problems, the development of the economy, therefore education, within the framework of capitalist and foreign relations; disruption of supply and demand balance in the professional field; technical staff migration to foreign countries, on the other hand, technical service inputs; unemployment, high cost, lack of social security, changes in the constitutional legal order, imbalances in organization, division of labor and specialization had a wide impact on the professional community and the public. In its tenth year, the journal has become a professional journal related to the local and regional problems of our country. oriented approaches. (Önal, “Mimarlık’tan” mimarlık 20. yayın yılını doldurdu, s.2, 1983)

In addition, journal has published on the subject of Industrialization of the building for the future of the sector, the development of traditional construction methods, the development of prefabrication of structural elements with simple techniques, the training of technical staff that will allow industrialization, the establishment of research centers, the determination of standards and international cooperation on all these issues. In this regard, examples of the world, and studies on the modernization of traditional construction methods have been transmitted.

Architecture in Turkey had the opportunity to realize itself only by positioning parallel to the country's politics in the period until 1990, when the country was liberalized. In the face of international developments, the demand to

shape his own professional policy and field of action came to the fore with the concern of being late to the developments in the world (seeing it as a demand for 'to keep up to date'/modernization), and in this context, architects wrote articles on 'Architectural Policy' and 'Legal Rights'. (Selçuk, 2019)

EVALUATION

From 1940 to the end of 1980, it was observed in the journal under seven main headings, from determination to discourse, from discourse to politics. These;

1-Recognition, promotion and qualification of Turkish Architecture: Architectural project publications, architect presentations, current approaches to technical and planning related to building types

2-Architecture Law: (Establishing a Professional Organization, Creating Professional Law, Continuous Professional Development Studies, UIA 2005 Istanbul Architects Declaration): Professional Chambers and Non-Governmental Organizations Institutionalizing and Making Their Inner Democratic Structures Work, Local Governments Law and Civil Constitution demands

3-Urbanization and Housing: Presenting news, evaluation, analysis and policy suggestions on zoning, city and housing issues. News, evaluation, analysis and criticism articles on urbanization and municipalism. Transferring current developments in urbanism and architecture from the world, case studies and transfers on issues related to the local agenda.

4-Architectural Education: Introducing current approaches and developments in architectural education in Europe and America, graduation exhibitions in our country and publications of selected student projects

5-Problems of the Building Sector, material and technological developments

6- Bringing the Agenda and Developments of Professional and Technical International Organizations to the Agenda

7-Institutionalization of Local Responsibilities to Profession and Society, Protection and Sustainability of the Historical and Natural Environment

Over the past thirty years, since 1986, the Chamber of Architects has carried out various studies to create an 'Architectural Policy'. In the 50th year symposium of the Chamber of Architects held in 2004, the Chamber's works were divided into three periods; The foundation period of 1954 - 1971 is defined as the second period from 1971 to 1986, and the third period from 1986 to 2004. (Tuna, 2021)

Starting from the mid-eighties, the fact that both life practices and formal imitations of objects caused insecurity and hesitations in the society is the reason for the 'self-realization-search' attempts of the Chamber of Architects. In the process that started with the 'Bursa Declaration' in 1986 for the restructuring of the Chamber of Architects after 1980, TMMOB

Chamber of Architects organized two symposiums aimed at recognizing, documenting and establishing its own reality over the concept of 'Turkish Architecture'. The National Architecture awards and exhibition were organized and institutionalized. Emphasis was placed on the importance and development of architectural competitions. Architectural law studies were put on the agenda again. Studies were carried out to standardize architectural education and restructure its content. (Selçuk, “Türkiye Mimarlar Odasının 1990-2005 Dönemi “Mimarlık Politikaları” , 2021)

In the nineties, the main reason for the policy and legal assurance demand of the architects was the zoning problems in the big city centers and the critical attitude towards the politics in the formation of these problems.

In my analysis of the post-1980 period, I synthesized policies under seven main headings. Since its establishment, the Chamber of Architects did not consider it sufficient to work at the scale of building and construction, and tried to put forward suggestions, examinations and analyzes in the fields of professional planning and policy development. He continued this stance after 1980 and put forward policies under the following headings.

1-Recognition, promotion and qualification of Turkish architecture (continuous professional development center, UIA 2005 Istanbul architects declaration)

2- Institutionalizing local responsibilities towards the profession and society

3- Drafting a civil constitution and drafting a law on architecture (local government law, professional law studies; institutionalization of professional chambers and non-governmental organizations)

4- Seeking a method for Autonomy and Pluralism (pluralism in the diversity and identity of the members of the chamber of architects, architectural education, public administration)

5-Creating and developing an architectural environment worth sustaining and livable, making natural and cultural assets visible

The Chamber of Architects has looked at professional problems with a perception far beyond its own medium. He has been far from solving the problems of his colleagues regarding the profession in its actuality.

REFERENCES

25.Yılı Bitirirken. (1955). Arkitekt, sayı 4.

Anonim. (1938). Milli mimari Meselesi Cereyanlar. Arkitekt.

Anonim. (1940). Türk Yüksek Mimar Odaları Teşkiline doğru. Arkitekt, sayı 1-2.

Anonim. (1947). Arttırma ve Ekiltme Kanunu Bugünkü İhtiyaçları Karşılamaya Kafi Midir? Arkitekt, sayı 9-10.

Anonim. (1948). Ankara Belediyesine Uygun Şartlarla Tahsis ve Temlik Yetkisi Verilmesi Hakkında Kanun, . Arkitekt, sayı 9-10.

Anonim. (1949). Yapı Kredileri. Arkitekt, sayı 7-8.

Anonim. (1950). Ruhsatsız Yapıların Yıktırlımasına ve 2290 Sayılı Belediye Yapı ve Yollar Kanununun 13 üncü Maddesinin Değiştirilmesine Dair Kanun . Arkitekt, sayı 3-4.

Anonim. (1952). Bizde Mesken Finansmanı. Mimarlık, sayı 9-10.

Anonim. (1954). Şehrimizde Arsa Spekülasyonu. Mimarlık, sayı7-8.

Anonim. (1955). Belediye Yasağı. Arkitekt, 1.

Anonim. (1956). Türkiye'de Mesken Meselesi _I. Arkitekt, sayı 2-3.

Anonim. (1957). İstanbul'un İmarı Hakkında Düşünceler! Mimarlık, sayı 1.

Anonim. (1959). U. İ. A. Şehircilik Komisyonunun İstanbul'daki Toplantısı Münasebetiyle. Arkitekt, sayı 1.

Anonim. (1963). İstanbul'un Planlanması Nasıl Yapılmalıdır? Mimarlık, sayı 4.

Anonim. (1964). Mimarlar Odasının Çalışmaları Hakkında. Mimarlık, 4.

Anonim. (1965). Mimarlar Odasının 1965 çalışma Programından Notlar! Mimarlık, sayı 1.

Anonim. (1965). TMMOB'nde Güç Birliğini Saklamak Konusunda Mimarlar Odası Görüşü. Mimarlık, sayı 17.

anonim. (1966). İnşaat Yatırımları. Arkitekt, sayı 1.

Anonim. (1966). İnşaat Yatırımları. Mimarlık, 1.

Anonim. (1967). İstanbul Vatan Caddesi Mevzi İmar Planı Yarışması. Arkitekt, sayı 2.

Anonim. (1967). Odanın Basın Toplantısı. Mimarlık, sayı 41.

Anonim. (1968). Konut ve Arsa Ofisi Tasarıları Meclis Komisyonunda Kabul Edildi. Arkitekt, 1.

Anonim. (1968). Turizm Müesseselerine Ait Vasıflar Yönetmeliği. Arkitekt, sayı 4.

Anonim. (1970). Haberler: Güney Sahillerimizde 3 Milyar Liralık Turistik Tesisler Kurulacak, . Arkitekt, sayı 1.

Binalarda Kat Tahdidi. (1957). Arkitekt, 3.

Eagleton, T. (2005). Kültür Yorumları. İstanbul: Ayrıntı Yayınları.

Eldem, S. (1939). Milli Mimari Meselesi. Arkitekt, 220-223.

Eldem, S. (1940). Yerli Mimariye Doğru. Arkitekt, sayı 3-4.

Haber. (1954). Mesken Darlığını Önlemek İçin Takma Evler Getirtilecek. 9-12.

Haber. (1967). İstanbul Bölge Kalkınma Kongresi. Arkitekt, sayı 2.

Haber. (1967). Kat Mülkiyet Kanunu Değişecek. Arkitekt, 1.

Haberlerler. (1959). İşçi Sigortaları Kurumunun İnşa Ettireceği Yeni Tesisler. Arkitekt, sayı 4.

İnşaat Sektörünü Aksatan Nedenlerden Biri Olarak "Genel Yerleşme Planlaması" Eksikliği. (1965). Mimarlık, sayı 26.

İstanbul'un Okul Dâvası. (1958). Arkitekt, sayı 2.

Laclau, E., & Mouffe, C. (201). EVRENSELLİK, KİMLİK VE ÖZGÜRLEŞME. İstanbul: Birikim.

Mimarlar Odası Ödülü ve Sergi . (1967). Mimarlık, sayı 46.

Mimarlar Odası Serbest Mimarlık ve Şehircilik Bürolarının Tanım Tescil İş Dağıtım Düzeni. (1967). Mimarlık, sayı 49.

Mimarlar Odası ve Ülke Düzenleme. (1967). Mimarlık, sayı 48.

Mimarlar Odasının Toplum Hizmetindeki Çabaları. (1965). Mimarlık, sayı 18.

Mimarlık Eğitimi Konusunda Bazı Mimarlık Otoritelerinin Görüşleri . (1965). Mimarlık, sayı 24.

Modern Şehirlerin Gelişmesi ve Türkiye'ye Has Bazı Eğilimler. (1965). Mimarlık, 21. sayı.

Moraş, A. (1941). Modern Türk Mimarisi. Arkitekt, sayı 5.

Önal, M. (1973-111). Onuncu Yıl İçin. Mimarlık, 57.

Önal, M. (1983). “Mimarlık’tan” mimarlık 20. yayın yılını doldurdu, s.2. Mimarlık , sayı 188 s.2.

Sayar, Z. (1941). İmar Politikamızı Kuralım ve Teşkilatlandıralım. Arkitekt, sayı 11-12.

Sayar, Z. (1943). Nafia Sergisi Münasebetile. Arkitekt, 3-4.

Sayar, Z. (1943). Yapı ve İmar Politikamız Var Mıdır? Arkitekt, sayı 3-4.

Sayar, Z. (1945). Harp Sonrası İmar İşleri. Arkitekt, sayı 9-10.

Sayar, Z. (1945). Şehircilik İşlerimiz. Arkitekt, sayı 5-6.

Sayar, Z. (1946). İdareciler ve Mimarlar . sayı 5-6.

Sayar, Z. (1948). 1 inci Türk Yapı Kongresinden Beklediklerimiz. Arkitekt, sayı 1-2 .

Sayar, Z. (1948). Mesken Buhranı ve Bina Yapımını Teşvik Kanunu. Arkitekt, sayı 7-8.

Sayar, Z. (1951). Siz Karar Veriniz! Arkitekt, sayı 5-6.

Sayar, Z. (1951). Yapı Polisi. Arkitekt, 9-10.

Sayar, Z. (1952). Mesken Davasında teşkilat. Arkitekt, 11-12.

Sayar, Z. (1954). Şehrimizde Arsa Spekülasyonu! Arkitekt, sayı 7-8.

Sayar, Z. (1955). Birkaç Mühüm Mesele. Arkitekt, sayı 1.

Sayar, Z. (1957). İstanbul'un İmarı Hakkında Düşünceler! Arkitekt, sayı 1.

Sayar, Z. (1959). Son Yıllarda İnşaat Azaldı. Arkitekt, sayı 4.

Sayar, Z. (1960). Yapı ve İmarda Yeni Ruh. Arkitekt, sayı 2.

Sayar, Z. (1963). İstanbul'un Planlanması Nasıl Yapılmalıdır? Arkitekt, sayı 4.

Sayar, Z. (1964). Lüks Konutlar. Arkitekt, sayı 3.

Sayar, Z. (1965). 1964 Yılında Türkiye'de İnşaat Faaliyeti! Arkitekt, sayı 2.

Sayar, Z. (1970). Turizm Politikamızın Çeşitli Problemleri Arasında Ön Planı İşgal Eden Bir Konu : Hotel. Arkitekt, sayı 2.

Sayar, Z. (1970). Turizm Politikamızın Çeşitli Problemleri Arasında Ön Planı İşgal Eden Bir Konu : Hotel. Arkitekt, sayı 2.

Selçuk, H. T. (2019). 1990 Dönemi Mimarlık Dergilerinde Söylem Analizi. Ankara: Palme Yayınevi.

Selçuk, H. T. (2021). “Türkiye Mimarlar Odasının 1990-2005 Dönemi “Mimarlık Politikaları” . Düzce Üniversitesi Bilim ve Teknoloji Dergisi,, s.531-540.

Toplum ve Mimarın Rolü. (1963). Arkitekt, sayı 2.

Tuna, B. (2021, Haziran). ‘1986 Bursa Deklarasyonu’ndan 2006’ya…’. MimarlarOdası:http://www.mo.org.tr/index.cfm?sayfa=belge&sub=detail&bid=14&mid=14&tip=0&Recid=10228. adresinden alındı

Turistik Tatil Köyleri . (1965). Mimarlık, sayı 17.

Türk Şehirciliği. (1950). Arkitekt, sayı 3-4.

Türkiye’de Genel Yerleşme Sorunu . (1965). Mimarlık, sayı 21.

Unoran, E. (1967). 1967-8 Türk Mimarlarının Odası, Ergun Unaron. Mimarlık, sayı 46.

Ülkemizde Mimarlar Nerede Duruyor? (1968). Mimarlık, sayı 62.

Wagner, B. (1956). Türkiye'de Mesken Meselesi _ I-II . Arkitekt, sayı 2-3.

INTERNAL AND EXTERNAL OTHERNESS OF HILTON HOTEL: EVALUATION OF THE BUILDING IN THE CONTEXT OF DUALITY

Aslı CAN VARON[1]

[1] *Yeditepe University, Turkey*
asli.can@ydeditepe.edu.tr

ABSTRACT

The study, titled *Internal and External Otherness of Hilton Hotel: Evaluation of the Building in the Context of Duality*, tries to refer to the Istanbul Hilton Hotel of the 1950s, which can be subject to different discussions in different contexts, to a dual reading through double-layered otherness. The mentioned duality; along with the location of the building in the built environment as an urban artifact, in addition to its relationship with the *outside*; it also discusses the otherness *inside* the building itself as an architectonic object. While this essay paves the way for multi-layered evaluations of the building in question, it aims to present an alternative view of architectural history. Undoubtedly, the Istanbul Hilton Hotel, which was built with the conscious choices and inevitable existence of all these contrasts; after trying to understand in the context of all these othernesses; it is necessary to evaluate the hybrids that occur with the collisions, fusions, and transformations of the said oppositions. Today, the Hilton Hotel; it has strong implications of neither the old inner nor outer othernesses. A miscellaneous reading that can be done today; it will reveal that some of the constraints that arise in architectural historiography lose their meaning when they are out of context and that a new reading or a new existence is always possible.

Key Words: Hilton; Americanism; Otherness; Binary Oppositions.

INTRODUCTION

Defining an absolute Subject in an epistemological context will inevitably remain inaccurate, incomplete, and one-dimensional unless one pronounces its Other. In this context, it would not be a wrong proposition to say that subject being presented, beside its ontological existence, shares the unshakable qualitative characteristics of the Other. While the subject creates itself through its Other, it also strengthens, defines, and confines the Other to reinforce its own power. In other words, the particular absoluteness of the subject is interrupted by the deviations of the it. Therefore, the existence of an absolute subject is only possible with an unshakable absolute Other.

Defined by Staszak (2008), Other is perceived as the member of a dominated Out-group, whose identity is considered lacking and who may be subject to discrimination by the in-group. The term *the Other* identifies the "other" human being in his and her differences from the Self, as being the cumulative, constituting factor in the self-image of a person; as acknowledgement of being real; hence, the Other is dissimilar to and the opposite of the Self, of Us, and of the Same (2021). However, if focusing on the term *opposite,* another discussion appears, which reveals the understanding of binary oppositions. Self, opposites itself with the Other; and from that point of view, it's quite easy to percept that both terms are unreal constructions, which strengthen each other by the increasing meanings.

However, an alternative approach is always available to be able to assess the situation. The familiar actors of the structuralist philosophy read the world through homogeneous binary oppositions. The generalizing approach; although it prevents to reach the essence of multi-layered narratives to a certain extent, it contains a useful method suggestion when various structures are in question. Therefore, it would be unfair to say that the attempts to analyze a structure analytically follow the wrong path in line with basic systematic fiction envisaged by structuralism, in the direction of making multiple information visible on equal parts of the scales.

The study, titled *Internal and External Otherness of Hilton Hotel: Evaluation of the Building in the Context of Duality*, tries to refer to the Istanbul Hilton Hotel of the 1950s, which can be subject to different discussions in different contexts, to a dual reading through double-layered otherness. The mentioned duality; along with the location of the building in the built environment as an urban artifact, in addition to its relationship with the *outside*; it also discusses the otherness *inside* the building itself as an architectonic object. While this essay paves the way for multi-layered evaluations of the building in question, it aims to present an alternative view of architectural history.

External Otherness

"We could see the new building from our house, and though at first it looked foreign against Istanbul's tired old silhouette, during the years that followed my parents grew accustomed to it, going there whenever they could."

Orhan Pamuk, The Museum of Innocence

Designed by the architectural firm Skidmore, Owings and Merill (SOM) with the collaboration of Sedad Hakkı Eldem, the building was celebrated both as an example of United States' role in the internationalization of architecture and Turkey's willingness for Westernization (Akcan).

The construction of the Hilton Hotel is undoubtedly a turning point for Turkish Architecture. In order to read it correctly, the first thing to do can be regarded as an analysis of the political catalysts that provide the necessary background for the structure to exist.

The political subject during the Early Republic Period is undoubtedly the Republican People's Party (CHP). This time interval, dated to 1923-1946 and called the Single Party Period, corresponds to the affirmation of the absolute power of the CHP, disregarding the trials other parties that ended in a fiasco such as the Terakkiperver Cumhuriyet Parti (Progressive Republican Party) or the Serbest Cumhuriyet Fırkası (Free Republic Party). As the political subject, the CHP also undertakes the transcendental representation of the newly established state. The aforementioned representation apparatus is reinforced with all texts and articles written during the period, especially at *Ulus* Newspaper. Moreover, even the shifting trends in the political context does not impair this reinforcement. As the subject knows how to create itself during changing conditions, it also holds the reins of the Other tightly and knows how to adapt it to the changes.

In this context it can be said that the Democratic Party (DP), founded on January 7, 1946, is a form of the Other. This Other that kept its avant-garde nature until it managed to Absolutize itself and changed the Turkish Politics abruptly.

The Second World War results in a decisive defeat of Germany and its allies in 1945. This social event, which can be described as the most traumatic crisis of modern times, inevitably displaces all the dynamics in the world. In a new world where all political, sociological, economic, and cultural balances are changing, it is inevitable that architectural production, which can be described as the reflection of these balances in the third dimension, will also undergo a critical change. Without a doubt, this new cultural understanding, that only starts to yield products in the architectural practice at the 50s, finds its reflections in Turkey. Architectural production in America and Europe after the Second World War reconstructs modernism as a reaction to the national architectural period structures that employs large-scale, monumental, and nationalistic indicators. Beside the works of architects such as Walter Gropius and Ludwig Mies van der Rohe, who fled from Nazi Germany to America, carried the Bauhaus school with them and applied it to the functions that emerged after the war and introduced a new

rationalist understanding of architecture, as well as the rediscovery of Le Corbusier in Europe, the dawning of architects such as Frank Lloyd Wright and Louis Kahn, who marked the period with their search for organic architecture, means the beginning of a new era for the practice in question. For this reason, the 1950s are regarded as a turning point for a transition from various strict and canon architectural narratives to a rational, pluralist, and free sphere of production; also called the *International Style*.

Turkey, at the end of the Second World War, joins the side of Britain and France, by declaring war on Germany as a formality. This political repositioning brings about further developments such as Marshall aid received from America and NATO membership. The dissolution of autocracies in the World stage results in replacing the CHP driven single party system by a multi-party System with elections and eventually an elected DP government.

With the landslide election victory of the DP on 14 May 1950, Turkey's Early Republican Period came to a decisive end. By a wide consensus among scholars, the 1950s marked a major new turn in modern Turkish History – one that has ushered in the transition to multi-party democracy, the relaxation of the radical secularism, statist economic policies and nationalist isolationism of the Early Republic during the previous two decades, and above all, a more ambitious regional role for Turkey in the Post-WWII international order (Bozdoğan, 2016).

The reflections of the above-mentioned political catalysts first show themselves in the economic context. The DP, which came to power with the slogan " private enterprise and capital is essential for economics," paves the way for liberal capitalist thought and a reduction in state capitalism in their government program: "The essence of our economic and financial views can be expressed as shrinking the state sector as much as possible and expanding the field of private enterprise as much as possible."

All these elements irrevocably transform the architectural production in Turkey. It was inevitable for the developments in the social structure led by the exposure to the international system and adopted liberal model to force architectural medium of Turkey to change. The change was deeper and structurally beyond what was seen as a change of form during those years (Batur, 2005). Rapidly evolving architectural styles in the post-WWII, Europe and USA deeply influence production and practices of Turkish architects, thanks to proliferation of imported architectural magazines, helped by ease of imports. Another important infrastructural factor for this adoption phase is the change in the nature of cultural and political relation between Turkey and Germany, therefore allowing monitoring and discussion of developments in other countries and stop only reflecting German Cultural sphere.

While the architects of the country are introduced to new forms, the ease of access to new materials is extremely effective in the transformation of the "National Architecture", which is referred to as the "Stone Age" by Sedad Hakkı Eldem. With the enactment of the "Regulation on Architecture and Urban Planning Competitions" in 1952, the architectural competitions, that

were criticized during the 1940s, are regulated, which facilitates the establishment of freelance architecture bureaus.

According to Afife Batur, first, the sources of construction demanded changed (2005). The priority given to the private sector by economy enlarged the volume and contents of the construction demand of this sector. It enlarged the share of determination in the architectural quality. New building types joined the typological program of Turkish architecture. The types of buildings such as the business offices, markets, etc. needed by the new economy and the growing business volume entered the agenda of the architecture of 1950s with their own diagrams and cliches. As a third factor, the loans directed by the foreign aid (The Marshall Plan) to the mechanization of agriculture caused the 1950s to be remembered as the tractor years, and to start the migration of labor, which became useless in agriculture, from the provinces to towns. The free trade regime eased the imports of construction materials. With agents such as the post-war devaluations of Europe the production surpluses and the direction of foreign aid and the loans to construction and public improvement projects, the 1950s became the period when the construction sector boomed. The building types the loans were used for, the important materials and technology brought forth the thought and design trends connected to them (Batur, 2005).

In architecture, if not in literature or politics, the modern retained its attractions in the post-WW II era (Wharton, 2016). The architectural reflection of opening up the world, rapprochement with USA and liberalization of economy is, as Sedad Hakkı Eldem claims to be the turning point for the Turkish architecture, is the Turkey Istanbul Hilton Hotel, the first five star of Turkey, designed by the American Skidmore, Owings & Merrill (SOM) and local construction undertaken personally by Sedad Hakkı Eldem himself, who refers to the Hilton Hotel with the following sentences: “This architecture that alienated itself from regional (neighborhood) scale, climate and material, that dared to enter the nature and the rots of the Street as a shiny equipment or machine would sooner or later loose this freshness and brightness and indeed this was what happened.” (Akcan, 2001).

Bozdoğan refers to Hilton Hotel as an alien spaceship that was fraught with difficulties, not only for the pride of the host nation, but also for American ‘soft politics’, which understood the strategic need for some concessions to local culture, not to mention the latter’s marketing value for commercial tourism. Posters and publicity material never failed to mark the exotic location of this ultra-modern new hotel (Bozdoğan, 2016).

According to Wharton, a building is never a passive object in the landscape, large or small, prominent, or hidden, its mass and location reveal the status of its processors. Its manipulation of the movements of those, who use it divulge the intentions of the designers (Wharton, 2016). From this point of view, The Hilton Hotel is a collection of othernesses. The Hotel is the first blow against the green cover, named as the number one park in Istanbul by Henri Prost, extending from Gezi Park to Maçka Democracy Park, thereby

becoming the other to the green fabric in question as well as the existing architectural environment as the "first" rationalist example. This avant-garde feature, which we call otherness, will evolve into becoming the main subject with the various practices seen in the city throughout the 1950s.

In order to be able to understand the importance of the location, it's imperative to open the Prost plan to discussion.

The urban interventions of the 1950s largely followed the blueprints laid out earlier by Henri Prost, who led the planning Office of the Istanbul Municipality between 1937 and 1951. Prost's 1939 master plan for Istanbul equated modernity with open spaces ('espaces libres') as he called them: wide boulevards, large squares and public parks modelled after European precedents. As such, it responded to the early republican quest for making modernity visible by showcasing the openness, spaciousness, and cleanliness of modern public spaces, positioning them as the anti-thesis of the congestion and unhealthiness of traditional (especially 'oriental') cities. As Dr Lütfi Kırdar, the popular governor/mayor of Istanbul, put it in 1943, 'Istanbul was a diamond left among the garbage' and the task of urban planning was to clear away 'the garbage' to reveal the diamond. Demolishing chunks of the old fabric (old wooden houses, small shops, warehouses, and unseemly derelict structures), opening new roads or widening existing ones, and laying out the urban squares and landscaped public parks (in contrast to the more private Ottoman Garden or bahçe tradition) were the primary devices employed by the Prost plan (Figure 1) (Bozdoğan, Akcan, 2012).

Figure 1. Park No 2 designed by Henri Prost

İpek Akpınar reports that Henri Prost was invited to Turkey in 1936 by Mustafa Kemal Atatürk himself (2010). Delivering the city's first master plan proposal the very next year, in 1937, Prost proposes a design consisting of a visually strong road network that connects functional zones with the theme of beautification. Prost, the designer of the plan, which was developed and implemented in parts until 1950, is dismissed by the DP after having won the local elections in 1950. This factor can be accepted as one of the first reflections of the CHP-DP dichotomy in terms of othering in the political context, since Prost was considered to be İsmet İnönü's main man, and all his actions during his period are also attributed to CHP, that the DP stopped this trend and made a change in the aforementioned area was not surprising at all (Akpınar). On a more architectural scale, the primary focus of modernist interventions in republican Istanbul was the Taksim area on the northern side of the Golden Horn, the major urban hub from which new roads radiated towards the historical peninsula to the South, the Bosporus to the east and newer residential and commercial neighborhoods of Harbiye and Nişantaşı to the North. Following Prost's schemes, the traffic around Taksim Square was reorganized and the old military barracks flanking the square were demolished to make room for a large European-style public park (Inönü Gezisi), complete with row of trees, flower beds paved pedestrian paths and terraces. To complete this overall geometrical order visualizing modernity, The Taxim Municipal Casino (Taksim Belediye Gazinosu, 1938-1940, now demolished) was built at the northern end of the park, giving Istanbul its paradigmatic early republican period space (cafe, restaurant, ballroom, and wedding hall) where modern (that is, Western), secular norms of recreation, entertainment and civility were displayed (Bozdoğan, Akcan, 2012). The Hilton Hotel was realized with the opening of the green park area no 2, recommended by Prost, starting from İnönü Gezisi and extending to Maçka, for the first time and with special permissions (Figure 2).

Figure 2. Hilton Hotel within its green park context

In 1951, the same year that Prost was dismissed, an SOM team led by Gordon Bunshaft, who would start working on the Hilton Hotel the following year, arrived in Turkey and prepared a report for the UN on the conditions and problems of housing and urbanization in Turkey (Bozdoğan, 2016).

SOM was a major player in development of American modernity. Indeed, SOM had a significant role in the consolidation of America's Association with Modern architecture in the post war years. The centrality of SOM in the emergence of the Modern as the architectural expression of American corporate and state power is suggested by the range of scale of its commissions. The Istanbul Hilton, like those new diplomatic structures, gave the emergent American presence in Europe, Asia, and South America a modern material form. The Turkish government was committed to attracting more tourists, and concomitantly, more hard currency to their country. It worked with the US government to facilitate developing tourism's infrastructure and, as Houser's letter of August 1950 makes clear, welcomed Hilton's corporate interest in Turkey (Wharton, 2016).

Indicative of the persuasiveness of Modernism in the early 1950s is the construction of the Istanbul Hilton and its celebration by the city that was so changed by its presence. In April 1951, Hilton International and the Turkish government (Menderes-DP) announced their agreement to construct a new hotel in İstanbul. The Istanbul Hilton was inaugurated with a gala celebration a little over four years later in June 1955 (Wharton, 2016). Looking at the construction of the Istanbul Hilton as a political investment in a strategic location bordering the Soviet Union, the US government heavily invested in the Project and the construction was publicly financed by the Turkish Pension Funds with loans from the Bank of America and with additional funds from the Economic Cooperation Administration (ECA). The construction was undertaken by German firms in collaboration with on-site Turkish engineers, and the hotel was opened with spectacular ceremony and a media extravaganza in June 1955 (Bozdoğan, 2016). The Hilton presented to Istanbul a set of unfamiliar modern forms – architectural, culinary, recreational that were peculiarly identified with the United States (Wharton, 2016).

In terms of the Hilton Hotel, 1950s can be considered as the first term of the exposure to the international system in architecture. The most prominent characteristic of this period, which lasted until the end of the 1950s, was the adaptation of the principles and forms of the International Style to the designed subject without taking into consideration whether they were fit to the conditions of Turkey, the cultural and physical structure of the environment and its technological structure. In other words, the architectural problem was descended to the problem of the professional level of adaptation. There is no doubt this approach. That is internationalism then becomes identical with a very superficial appearance (Batur, 2005). Reflecting all of these aesthetic influences, the Istanbul Hilton Hotel (1952-1955), designed by Skidmore, Owings & Merrill (with Gordon Bunshaft as lead designer and Sedad Eldem as the local collaborating architect) is, by general consensus, the indisputable icon of post-war modernism in Turkey. It is also a textbook case of modern architecture's role in the US Cold War politics, at a time when the designs of US embassy buildings and Hilton hotels were seen as powerful visual instruments of projecting a positive image of America abroad (Bozdoğan, Akcan, 2012).

Figure 3. Conrad Hilton with the model of Istanbul Hilton

Internal Otherness

Said illustrates that the logical theorizing perspective from which to construct Orientalism is not that of the “Orient” but that of its opposite side – the “Occident”. “Orient” is constructed as an “other” opposed to the Occident. As far as the connotation of Orientalism is concerned, Said further points out that it overlaps three fields: the history of cultural relations between the East and the West which has lasted for over four thousand years; a discipline in which one generation after another of scholars dealing with Oriental languages and cultures are trained; and an image of the “other” created by generations of Westerners about the Orient. Since the Occident is ready to the “other” to the Oriental, the “Orient” in the eyes of Westerners is just an “other” of this “other”. Said continues by mentioning that Orientalism is a deep-rooted episteme of Westerners about the Orient that has always functioned as part and parcel of Euro-American colonialist ideology. This “Orient” has become the “other” of the West, from which Western people reflect its world. Thus, it is absolutely necessary for them to have such an “other” (Ning, 1997).

In connection with the lack of experience and inadequacy in the in the development of the construction technologies, the application of the International Style in Tukey was a kind of a “provincial” model. The provincial dictionary displays itself best when it turns to models using minute details and the opportunities of advanced comfort necessitating a high construction technology. Steel, which is one of the materials used by internationalist architecture, is expensive in Turkey. Therefore, reinforced concrete is used as the basic material in the structure of the Hilton Hotel. (Batur, 2005)

On the other hand, the duality of SOM vs Sedad Hakkı Eldem, two architectural approaches that marginalize each “other”, is also inevitably reflected in the architectural product. The so-called *Flying Carpet* (Figure 4), which is the canopy of the entrance, against the modular façade, the interior decorated with Eldem's obsessive hexagonal ceramics (Figure 5) against the rationality of the exterior enter into a relationship that alienates each “other”. Evaluated in this way, Hilton Hotel marginalizes itself and becomes the “Other” against both the new rationalist canon and the traditional building elements. Even though all these othernesses form one of the most familiar silhouettes of the city over time, they will ensure that the hotel will always preserve its unique character.

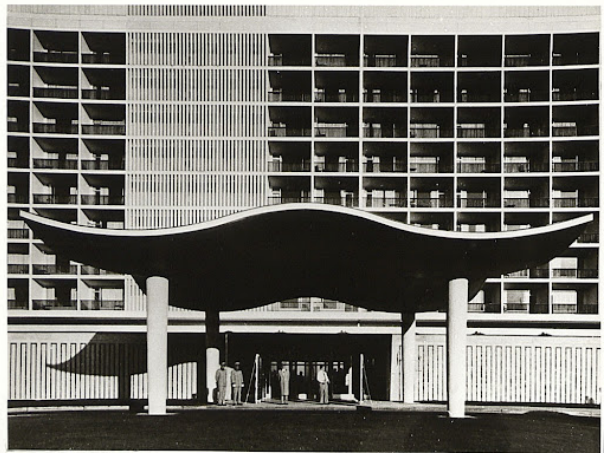


Figure 4. The “Flying Carpet” designed by Sedad Hakkı Eldem

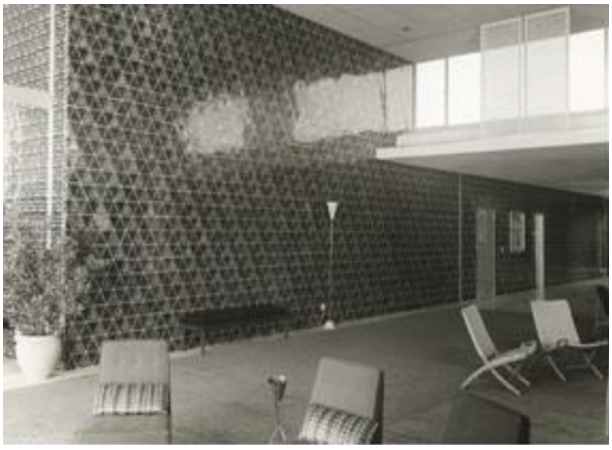


Figure 5. The ceramic tiles

The canonic Istanbul Hilton Hotel (1952-1955), designed by Skidmore, Owings, and Merrill with Sedad Hakkı Eldem as the local collaborating architect, is the widely acknowledged textbook case of modern architecture's role in Cold War politics. A prime location overlooking the Bosporus was allocated to the Hilton Project by the Turkish government and the construction was jointly financed by the Turkish Pension Funds (Emekli Sandığı) and the Economic Cooperation Administration (ECA) of the US government. The distinctly American ideal of democratizing comfort and luxury found its expression in the regular grid of the building's famous "honeycomb" façade. The stacking of identical units (hotel rooms) was evocative of a democratic efficiency: i.e., everyone gets the same cell. At the same time, the interior of the hotel room signified modern comfort through technological amenities like air conditioning, private baths, hot water, Wall-to-wall carpeting, and a radio cabinet. With its novel form, structure, and materials (including the imported White cement that gave the building its clean look) the Hilton would immediately become a symbol of technical perfection, precision, and progress (Bozdoğan, 2016). The result building is considered by both Sedad and Gordon as a satisfactory component between two worlds of culture (Wharton). Istanbul Hilton Hotel became the icon and initiator of the International Style a la USA and what might be called Americanization as an alternative model for modernization (Akcan, 2001).

Some details of the structure seem to support Owings' claim that Eldem's Turkish vernacular forms dominated Bunshaft's Modern ones. In the lobby and around the atrium, small cupolas were cut into the plane of the ceiling. At the entrance to the hotel, the prominet porte-cochére was designed as an elaborate vault of multiple double curvatures appropriately referred to as the "flying carpet". Equally flamboyant vaults covered the large night club to the rear Office building, the cocktail lounge of the roof restaurant, and the kiosk overlooking the swimming pool area. In these spaces, curvilinearity and brilliant color provided visual opulence. Complexly lighted domes, the

curved glass walls and sculptured bars offered the visual entertainment of the exotic East anticipated by Western traveler (Figure 6) (Wharton, 2016).

Figure 6. The dome

The interior order of the Istanbul Hilton, analogous to its exterior, perfectly expressed the spatial principles of the architectural avant-garde. Indeed, it would have fit welding into the handbook of American modernism, Hitchcock, and Johnson's International Style. The text codified the principles of the Modern, providing a compelling formula for architectural practitioners. First, volume, not mass: immaterial and weightless, surface materials must be subordinate to volume's expression. Second, regularity: clarity and uniformity, committedly anti-Romantic. Third, the avoidance of applied decoration; the building was a thing in-itself. Note that none of these principles are ethical, but rather they are strictly formal and aesthetic (Wharton, 2016).

On one hand, the reviewer considered 'Western' comfort standards and technology as prestigious cards, such as "the slick efficiency of the hotel room shaft", the existence of private bath in each room, New York designed kitchen, English furniture, aluminum framed glass doors, refrigerated garbage, and hygienic service areas. On the other hand, the "Oriental atmosphere" introduced in the interior with the "Karagöz Bar, Turkish motifs, Kütahya tiles and Konya Carpets – also seduced the visitors. The Tulip Room with all the rich trappings of an Arabian Nights Harem, the patio of Skidmore's idea of lead-roofed domes reminiscent of older Turkish courtyards or cupolas crowned with pinnacles, the entrance canopy attached to the main block as a pretty metonymic image of a flying carpet, supposedly "inspired by the gate of old Seraglio", which was designed by Eldem and characterized by Bonatz as an extremely cheerful invention, the dining hall attached to the rear side of the main block, reminiscent of a Şadırvan (Akcan, 2001).

Ostensibly Turkish (Ottoman) elements were incorporated into the design and contemporary commentators eagerly egotized these elements using all

the familiar orientalist clichés. In the end, the will for Americanization on the one hand, the anxiety produces by this very process on the other (that is the fear of a faceless, standardized International Style homogenizing the world and eliminating cultural difference) (Figure 7), reproduced in built form some of the same notorious orientalist binary oppositions that modernization was supposed to eliminate. The rationality of the main hotel block was juxtaposed against the sensuality of the auxiliary structures and interior furnishings; the tectonics of the former against the decorative character of the latter, respectively; the functional against the merely entertaining; and ultimately the Western against the Eastern. The fruitful cross-cultural intentions of the project (the appropriation of the principles of International Style in relation to climate control and locally available materials) were thus suppressed by reintroducing the divide between us and them (Bozdoğan, 2016). The mechanical, rational, progressive, serious Occidental International Style would be balanced by the spiritual, pleasurable, exotic, irrational, cheerful Oriental cultural heritage. Here, the architectural design was separated into two categories. The slick efficiency of American construction was accompanied by Turkish Artistry. The tectonic in contrast to the decorative, the functional as distinct from the entertaining, the progressive as opposed to the traditional were reserved for the Western set off against Eastern (Akcan, 2001).

Figure 7. The Istanbul Hilton Hotel

CONCLUSION

Perceiving the world as a series of binary oppositions undoubtedly results in ignoring all possible hybridizations, shifts and disintegration. The concept of the other appears as a product of this operation of ignoring, as a counter-modern construction. In this context, the concept; not their encounters, coincidences, or condensations; makes contrasts visible; this inevitably

creates the illusion of some kind in the context of attempts to read the world. For this reason, the perspective or framework of otherness is a kind of compulsion in its simplest sense and simple perception.

However, various constructions bring themselves into existence by using exactly this compulsion. Political catalysts in particular take advantage of the controversial existence of the mythlike and the necessarily other as they solidify themselves. When the production of architecture is accepted as the third-dimensional architectonic expression of political stances, as mentioned above; In historiography, it must be perceived in the context of this otherness.

In this context, the subject of the article, Istanbul Hilton Hotel; besides being a political statement; When evaluated through binary oppositions, it also includes an existential pain. At the same time, this pain emerges as a stalemate in which the West and the East, the CHP and the DP, America, and Russia, or, as discussed in the article, are in every binary opposition that marginalizes each other. Otherness is a closure mechanism. This closure makes the chain of binary oppositions it contains cannot exist independently of each other; paralyzes them.

Undoubtedly, the Istanbul Hilton Hotel, which was built with the conscious choices and inevitable existence of all these contrasts; after trying to understand in the context of all these othernesses; it is necessary to evaluate the hybrids that occur with the collisions, fusions, and transformations of the said oppositions. Today, the Hilton Hotel; it has strong implications of neither the old inner nor outer othernesses. A miscellaneous reading that can be done today; it will reveal that some of the constraints that arise in architectural historiography lose their meaning when they are out of context and that a new reading or a new existence is always possible.

REFERENCES

Akcan, E. (2001). Americanization and Anxiety: Istanbul Hilton Hotel by SOM and Eldem. Oriental-Occidental: Geogaphy, Identity, Space, 7(1), 38-44.

Akpınar, İ. (2010). İstanbul'u (Yeniden) İnşa Etmek: 1937 Henri Prost Planı. In E. Ergut (Ed.), 2000'den kesitler II: Cumhuriyet'in Mekanları/Zamanları/İnsanları (pp. 107-124). Ankara: Dipnot Yayınları and ODTÜ Yayınevi.

Batur, A. (2005). A Concise History: Architecture in Turkey During the 20th Century. Ankara: Chamber of Architects of Turkey.

Bozdoğan, S. (2016).Turkey's postwar modernism: a retrospective overview of architecture, urbanism, and politics in the 1950s. In M. Ö. Gürel (Ed.), Mid-Century Modernism in Turkey Architecture Across Cultures in the 1950s and 1960s (pp. 9-27). London and New York: Routledge.

Bozdoğan, S., Akcan, E. (2012). Turkey modern architectures in history. London: Reaktion Books.

Ning, W. (1997). Orientalism versus Occidentalism?. New Literary History, 28(1), 57-67.

Staszak, J-F. (2008). Other/Otherness. In H. Kitchin & T. Thrift (Eds.), International Encyclopedia of Human Geography: A 12-Volume Set (pp. 209-216). Oxford: Elsevier Science.

Wharton, A. J. (2016). The Istanbul Hilton, 1951-2014: modernity and its demise. In M. Ö. Gürel (Ed.), Mid-Century Modernism in Turkey Architecture Across Cultures in the 1950s and 1960s (pp. 141-163). London and New York: Routledge.

Wikipedia. (2021). Other (Philosophy). Retrieved from https://en.wikipedia.org/wiki/Other_(philosophy)

ELEVATED ARCHITECTURE: THE MISSING RELATION WITH THE GROUND

Esen Gökçe ÖZDAMAR[1]

[1] *Tekirdağ Namık Kemal University, Turkey*
gokceozdamar@gmail.com

ABSTRACT

In the history of architecture, many functional buildings have been raised from the ground in line with technical requirements. The idea of breaking off the ground as a technical/design act, while gaining importance due to groundwater and frost or floods and tides, has emerged as a relatively liberating paradigm in modern architecture. The liberation of architecture from the ground occurs in many societies that live above the water in hot tropical and humid climates, both in the form of architecture rising on a platform or elevation, as well as stilt (pile) houses. This article discusses the elevation of architecture as the idea of freedom or resistance to gravity. How does the elevation and disconnection of architecture from the ground contribute to its semantic values, or how does the space created by breaking away from the ground change our attitude towards the space? Therefore, this article examines the history of the idea of detachment from the ground on a theoretical basis, focusing on perceptions and senses, taking the example of elevated architecture and freeing elements against gravity in three different levels of elevation; flying stairs, cantilevers, and stilt structures, later discussing the examples of elevation from Calvino to megastructuralists.

Key Words: Elevated Architecture; Flying Stairs; Cantilevers; Stilt Structures; Gravity-Defying Architecture.

INTRODUCTION: ARCHITECTURE'S RELATION WITH THE GROUND

The relationship established with the ground has been one of the most important issues in the relationship of architecture with natural laws, such as gravity. Whether it is a permanent, temporary, or mobile architecture; a building's ability to stand firm against static and dynamic loads and disasters and the boundaries it establishes within the framework of the semantic, psychological, social, and social needs established with the earth and sky in the metaphysical context have deeply affected the meaning and perception attributed to architecture throughout the ages. As Moffett explains, "all structures respond to the vertical pull of gravity in the form of live and dead loads, and to side loads or lateral forces created by the wind and earthquakes" (Moffett, 2004, p. 2). The basement and ground, which make the building dependent on the ground floor as an optical/visual element, created a language compatible with the laws of nature, such as gravity. Pallasmaa also stated that all architectural structures have a sense of gravity at their core, and architecture shows us a consciousness of gravity and the earth, reinforcing the verticality of our experience of the earth and making us "aware of the depth of the earth", while at the same time allowing us to imagine "levitation and flight" (Pallasmaa, 2006, p. 37).

In the history of architecture, many functional buildings have been raised from the ground in line with technical requirements. After the Industrial Revolution, depending on the lightening of building materials and the ability to pass wider openings, different tendencies have emerged in the relationship established with the ground, through independence, breaking off, or elevation, in both modern architecture and postmodern architecture.

Carrying an object or building to a higher level or raising it from the ground, gives it relative importance; for example, religious ceremonies express importance as a sacred object through height differences (Ullmann, 2011, p. 124). For this reason, many buildings have been raised from the ground in the history of architecture. Although it is not known exactly how the idea of rising from the ground emerged, archaeological excavations and artifacts suggest that this idea may be equivalent to human history. In the Neo-Sumerian period (ca. 2150-2000 BCE), urban temple forms were distinguished by an artificial mound or ziggurat (Moffett, 2004, p. 16) or over a podium, and by greater size and central location, elaborate ornamentation, and wooden brackets and color schemes (Moffett, 2004, p. 91); e.g. "Hall of Supreme Harmony," in Forbidden city in the 15th-century (Moffett, 2004, p. 96) or "unpainted" Shinto temples in Beijing as rectangular structure raised above ground level on pillars (Ching, 1995, p. 255).

In addition to the technical requirements of the idea of rising from the ground in antiquity, "a high elevated podium of various tomb types" was observed in Carian and Lycian tomb architecture (Nováková and Ďurianová, 2018, p. 194). Other forms of elevated space that appear both in the body of the building and in an interior element, such as Proskeinon's being a raised platform in front of the stage building on which actors played in the Roman period (Akurgal, 1970, p. 355) or the raised catafalque or coffin, in different religions. An example is from the Neolithic era at Çatalhöyük, wherein 7000 BC each living room was equipped with at least two additional raised floors

(Akurgal, 1970, p. 3) and along the east wall, elevated platforms with a higher bench at the south end (Mellaart, 1964, p. 96) were used to bury the dead, after the bodies were opened to allow in for vultures to clean the body from its flesh (Mellaart, 1967; Pilloud et al., 2016, p. 2, 4). Again, in Islamic architecture, the coffin "must have arisen from the desire to put the corpse on a high place, as an expression of the respect shown to the dead" (Aksu, 2006, p. 233).

The idea of breaking off the ground as a technical/design act, while gaining importance due to groundwater and frost or floods and tides, has emerged as a relatively liberating paradigm in modern architecture. The liberation of architecture from the ground occurs in many societies that live above the water in hot tropical and humid climates, both in the form of architecture rising on a platform or elevation, as well as stilt (pile) houses. To protect the raised living area from factors such as tides, floods, or a house overflowing from the creek bed. However, the modern paradigm implied that buildings were heavy and had static properties, despite emphasizing lightness, such as being raised by piloties, and that a human-made structure was different from nature. The lightening of the building materials used after the Industrial Revolution, their ability to pass through larger openings, and the building's contact with gravity cut this optical relationship, allowing the building to break off from the ground and remain in the air. Examples, such as Villa Savoye or the Farnsworth house, are partially taken off the ground, reinforcing the idea of more visible and perceptible modernity between nature and human-made design. However, the idea of “detachment from the ground” that emerged and became visible with modern architecture for Le Corbusier and his contemporaries create a contrast between the “white and plastered modern”. In other words, space, designed to make the figure/ground relationship more visible and to dominate nature, has increased its autonomy. The idea of elevated space was also seen in the 1960s architecture, in the form of fiction or paper architecture, such as in the works of Buckminster Fuller and Shoji Sadao’s “Cloud Nine”, (1960) mobile architecture of Yona Friedman inspired by the works of megastructuralists and Italo Calvino’s “Invisible Cities” (1972).

BREAKING FROM THE GROUND: FREEING ELEMENTS OF ARCHITECTURE

Within this perspective, flying or floating stairs, cantilevers, and stilt structures can be counted as one of the freeing elements that make architecture independent from the ground. Flying—or floating—stairs are not limited to the stars at the entrance of a building to reach a veranda, but as the building is elevated from the ground, cantilever architecture negotiating lightness. Unlike modern architecture, the cantilever emphasizes the lightness of the architectural space or the building materials have taken their place in traditional architecture with a different language in some functional structures. Some examples of gravity-defying architecture are Moshe Safdie's Habitat 67 residence (1967), MVRDV's WoZoCo housing project (1997), Rem Koolhaas' CCTV headquarters (2004), and Santiago Calatrava’s Museum of Tomorrow (2015). Stilt structures are

structures elevated on piers and mainly used for warehouses, fishing, or dwellings can be observed in different geographies and cultures throughout history, which provide climatic conditions such as humid, floods, frost, etc. Using porous and hollow materials in humid climates also accompanies the form of the building.

Flying Stairs

Elevated/flying, floating or open-riser stairs are a vertical circulation element that has an empty pier and enhances the feeling of space. It has been made possible by modern building materials such as concrete, steel, or wood. They are used as steel ladders to reach a vertical surface in a short distance or to go up to carry the load falling on them, especially in maritime, boats, warehouses, and industrial structures—fixed or folding ladder type. “Ladders are used primarily in industrial construction and in utility and service areas. They may also be used in private residential construction where space is extremely tight and traffic is minimal” (Ching, 2014). But the downside of flying ladders is that they don't follow ADA accessibility guidelines because they don't have handrails, and they can also create a feeling of dizziness for some users.

From the entrance steps of Mies van der Rohe's Farnsworth house, flying staircases to many buildings were used by Rem Koolhaas. As a representation of International Style, Mies van der Rohe's Farnsworth House (1945-1951) consists of a roof and a raised floor including flying stairs as an entrance. As the 140 m2 home is located in the Fox River floodplain, it is elevated approximately 1.60 meters above a flood plain with eight white I-beam supports attached to the sides of the floor and ceiling slabs on a raised floor platform where floods occur frequently (Farnsworth (n.d.)) (Figure 1).

Figure 1. Farnsworth House with flying stairs (Wilson, 2013(a); Wilson, 2013(b)).

Another example of an elevated house can be observed in the typology of Charleston homes built in the 18th or early 19th century in Charleston, South Carolina, usually Georgian or Greek Revival style. Since the houses were built close to the ocean to prevent periodic coastal flooding or tidal rivers, they are raised above ground level with piles to prevent periodic coastal flooding and therefore the flood risk is reduced (Harris, 2006, p. 199) (Figure 2).

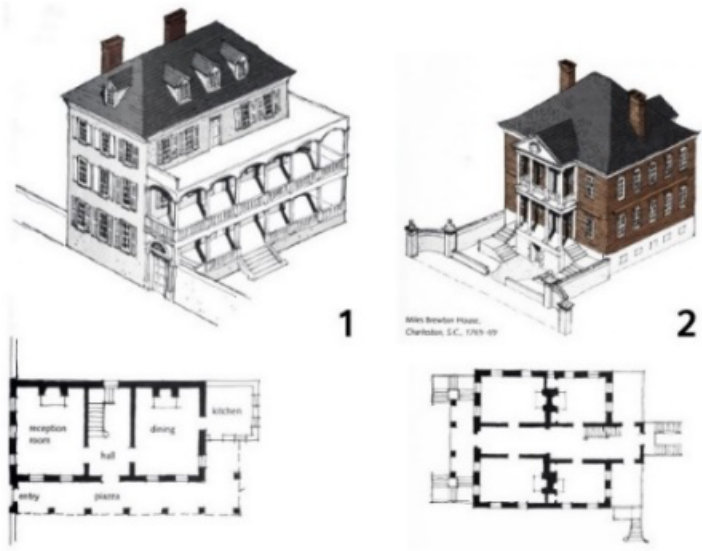


Figure 2. Two types of Charleston houses; 1) Single house perpendicular to the street with a flight of stairs, 1750-1863, 2) Box-like type Double house facing the street, 1730-1863 (Harris, 2006, p. 199; Foster, 2004, p. 155, 159).

CANTILEVERS

Another freeing architectural element from the laws of nature, at least symbolically and semantically, is the cantilevers. Cantilever architecture can be observed regarding morphological and tectonic forms that exist in nature. For example, trees and mountains are vertical projections in nature that "resist lateral wind forces" (Sun Moon, 2019, p. ix). Using a cantilever has created a more dramatic effect in modern architecture (Sun Moon, 2019, p. 1).

A cantilever is defined as "a beam supported at one end and carrying a load at the other end or distributed along the unsupported portion", with its top and bottom subjected to tension and compression stress, respectively, and used in "constructions and machines," as a "free end". Cantilevers carry "a gallery, roof, canopy, runway for an overhead traveling crane, or part of a building above" (The Editors of Encyclopædia Britannica, n.d.). According to the Dictionary of Architecture and Building Construction, a cantilever is both "a horizontal structural member supported at one end only" and "the structural configuration thus created" (Davies and Jokiniemi, 2008, p. 60). There are different types of cantilevers used in architecture such as a balcony without supporting tie rods or columns; a beam, slab bridge, stairs, rafter, walls, slab (Davies and Jokiniemi, 2008, p. 60). They may be used as building components such as entrance canopies, balconies, stairs, etc.,

or as interior elements and furniture such as chairs and tables (Sun Moon, 2019, p. 1).

Cantilevers have been applied in the form of suspension bridges in castles to protect the first settlement areas before the Roman Period, and then they were frequently used in structures and structures after the Industrial Revolution, and became an important component of the structure in modern architecture and especially in brutalism. Mostly used for bridges, large cantilevers constructed with horizontal or vertical cantilevers enabled stronger wide-span structures of iron and steel appeared in the middle of the 19th century, such as the Eiffel Tower (Sun Moon, 2019, p. 61, 62). As Viollet-le-Duc notes, the cantilever on the balconies dates to the 1st century - for example, a temporary wooden structure for wars, such as the working clock restored by Viollet-le-Duc on the Cite de Carcassonne (Sun Moon, 2019, p. 39). Another source of cantilevered exterior balconies can be found in the mashrabiya, "a small cantilevered oriel window with limited openings" in the "traditional Arab culture and climatic conditions" of the 7th century. It was a socio-cultural reflection because it was used for natural ventilation with its “louver-like openings” and provided privacy, especially for women in the house as it prevented direct visual connection from inside to outside (Sun Moon, 2019, p. 39).

In the following years, with the open-plan approach and freedom in modern architecture in parallel with the development, cantilevers began to be used frequently in architecture and allowed building systems to pass through wider and wider openings. Emphasizing the lightness of space or building materials with a different language have also found their place in certain functional structures in traditional architecture.

STILT STRUCTURES (PILE HOUSES)

Historically, many houses and structures, also known as pile houses, were raised to higher levels, often on stilts to protect them from pests in nature and to keep them away from animals that could harm them, to ventilate crops and preserve heat, and most importantly to adapt to the terrain as well as the climate. For these reasons, these structures are among the best examples of adapting to climate and natural conditions. They are often elevated above the water or on walkways or due to climatic conditions where there is a risk of flooding or tide to allow ventilation in humid climates or damage from ground frost in colder climates.

However, according to Rudofsky, pile houses were “never adopted for practical purposes”. More realistically, primitive builders have long lived in the safety of lofts”. Examples are fishing stations in Vieste, Italy, and Stanleyville, Congo, the entire Chinese village of Ho Keou in Yunnan province was built on stilts above the high water level (Rudofsky, 1964, p. 110) (Figure 3).

Figure 3. 1) Ho Keou village as stilt houses in Yunnan province, China; 2) A tree-house in the village of Buyay, located on Mount Clarence in New Guinea (Rudofsky, 1964, p. 110).

Among the fishing communities, stilt constructions began to cast nets into the sea. In the Neolithic, Copper Age, and Bronze Age, stilt settlements were observed in the Alpine (Ertl, 2008, p. 308), in hiking areas and lakes. The stilt structures, spread over a wide variety of geographies, exhibit similar patterns; a rectangular platform raised above the ground on wooden or bamboo legs, usually built with local materials. For example, fishermen are frequently used in places such as Istanbul and Şarköy as fishing places. This fragile and privileged cultural heritage branch is still used in Şarköy (Figure 4).

Figure 4. Stilt structures in 1) Kireçburnu, 1854 Ernest De Caranza photography, 2) Rumelikavağı Sophus Williams & E. Linde & Co. 1860 - 1890; 3, 4) Bebek (Dalyan. (n.d.)), 5, 6, 7) Şarköy (The Author, 2014).

The stilt structures appear in different climates structures or houses where permafrost is present in the Arctic are built on stilts to keep permafrost under them from melting. In indigenous Eskimo architecture (A.D. 1000-1200) were southerly or seaward orientation: semisubterranean house floors, involving raised sleeping platforms, cold-trap tunnels or passageways, domed snow houses, and tents—derive from a Thule base (Lee and Reinhardt, 2003, p. 4). They were mostly used as warehouses, appearing in the second half of the 19th century. Summer houses are made of two raw materials: wood and tanned walrus skin, the "Navağiaq" raised on two pillars, the "end posts and the square post", and the "fixed between the rocks and attached to them by a wooden post with 3 to 6 meters from the

ground (Lee and Reinhardt, 2003, pp. 100, 101; Alix, 2012, pp. 97, 102). Warehouses at Ikogmut and north Central Yup'ik houses were raised to prevent dogs, foxes, wolves, and mice, and from climbing and were "accessible using notched logs" (Lee and Reinhardt, 2003, p. 151) and also served to lift sleds, watercraft, and were built of wood and raised on stilts about 1.2 to 1.52 meters above the ground (Lee and Reinhardt, 2003, p. 152) (Figure 5).

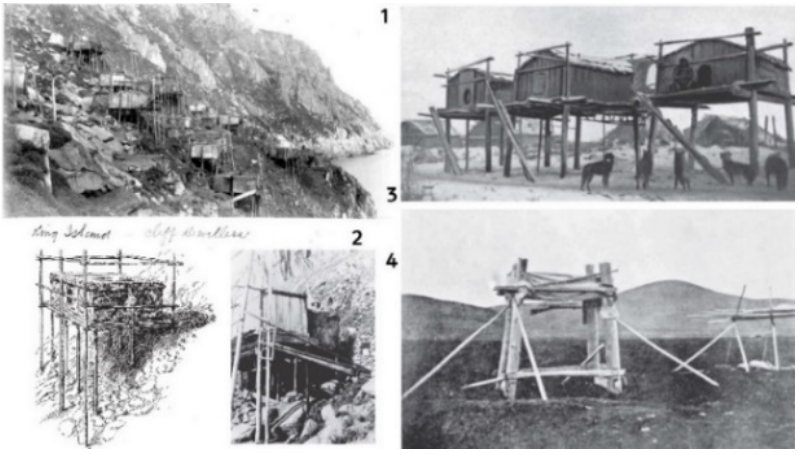


Figure 5. 1) Historical photo of King Island in 1888 (Alix, 2012, p. 103), 2) "Walrus skin summer house on King Island" (left) and Details of a summer stilt house, King Island, c.1899-1900 (Lee and Reinhardt, 2003, p. 101) (right), 3) "Storehouses at Ikogmut (Lee and Reinhardt, 2003, p. 151), 4) Elevated Eskimo graves near Keewalik (Lee and Reinhardt, 2003, p. 108).

Another example of stilt houses is the "serander" (also known as *nayla*), where the granary structures built right next to the houses in the Black Sea Region to store food intact, have a single function and a pure spatial arrangement. The *serander* is a two-story wooden structure on a stone substructure that usually meets the slope and provides an artificial floor for the upper floor. It is a floating structure that expands upwards and is carried only on feet, and the lower floor is left empty for ventilation (Batur, 2005, pp. 25-27). A *serander* sits on the floor of a stone substructure with 4, 6, or 9 wooden guides on 2 or 3 units. The piloties are rigidly supported by curvilinear wings to accommodate the overhead load, and the cylindrical trays at the head of the pilots were developed to protect the warehouse from potential pests. The upper storage floor is usually surrounded by a revolving patio. The patio area emphasizes the linear image above. Usually composed of 3 to 4 unit modules, this floor is quite high and in some instances, the upper units are extended to join the storage area. Wide eaves emphasize the lightness of the building (Batur, 2005, p. 27).

The "loft" granaries, (or *raccards*) that have similar features to the *serander* in Scandinavian architecture found in the Alps and Spain, were used as raised grain warehouses. Access to these areas is provided by a separate staircase or ramp. Lifting the serander and loft from the ground "protects

from the humidity of the ground and the harm of animals such as mice. The walls of the ground floor are made of thick logs, using the masonry technique" (Karpuz, 1999, p. 77). The loft is "thick wood walls and a door with a high threshold". It is built on stone foundations with "walls made of thick woods and a door with a high threshold" and rests on the ground, or the ground floor is raised from the ground and placed on wooden poles (Karpuz, 1999, p. 77) (Figure 6).

Figure 6. A Serander from the Black Sea (Batur, 2005, p. 135).

In the mountain forests of Chongqing, southwest China, the houses on the hill are called "Diaojiaolou" (hanging feet building) to avoid "infestation by snakes and scorpions." These wooden houses are strip-shaped, L-shaped, or U-shaped, with dark gray roof tiles along the slopes, made by the Tujia people (XiaoHui and Jialong, 2011, p. 1261). Inside the subtropic humid climate region, where it is flushed with rain and the air is humid, it is not favorable for living to build houses on the ground if there are no materials good at preventing moisture". People also lived above ground and raised animals on the ground (XiaoHui and Jialong, 2011, p. 1263). "Kelong" or "kellong", is an offshore platform made of wood in Malaysia, the Philippines, and Indonesia" (Collier, 1980, p. 37). At Tuguk, these platforms raise about "5 meters above the water on legs, which stand on the river-bottom and support a frame from which the fishermen lower their nets into the water every night at high tide" (Collier, 1980, p. 41). Another type of stilt house is the "Bahay Kubo" or "nipa" hut made of "wood or bamboo" typical of the

cultures of the Philippines, “one-room cubic house with a steep roof and wide eaves and “dried thatched palm or grass” (Cabalfin, 2020, p. 47) and provides natural lighting, ventilation, and prevention from low-level flooding. Because it is lightweight, the *bahay kubo* can be moved to another location with the help of a small group of residents. “Queenslander” is another type of stilt house in Queensland and northern New South Wales, constructed of a light wood-framed structure with “a floor plan of four or six-core rooms” with a “central corridor which provides access, and shaded by verandas”. The houses are raised on stilts appropriate to the terrain (Bajracharya, Kumarasuriyar, and Demirbilek, 2003, p. 3). The early houses in Queensland were built on the ground, but in the 1870s it was common for houses to be raised on stilts. This change is attributed to "protecting the timber from white ants, catching the higher level prevailing breezes, getting a flat floor on a sloping site without excavation and hence not changing the nature of the landscape, flexible use of the ‘under house’ space, ventilating the ‘under house’ area, and providing a cool air pool beneath the floor (Bajracharya, Kumarasuriyar, and Demirbilek, 2003, p. 4). “Pang uk” (shack house), “Chang Ghar”, built on rivers or small beaches, was built in the state of Assam, the flood-prone areas of the Brahmaputra river valley in India. “Chang Ghar” “is designed to tackle earthquakes and moderate floods” and made of “bamboo for the floor, walls, and roof” and “the connections are made with coir or jute ropes which allow flexibility during the earthquake”, “however, during very heavy floods, the stilt houses are not able to withstand the damage” (Ravishankar and Ji, 2021, p. 957). “Thai stilt house” built on freshwater, and made of timber and bamboo, with no use of metal including nails (Charoenchai and Bhaktikul, 2019, p. 90-91) or “Vietnamese hill house” and Myanmar stilt houses are some other examples (Figure 7).

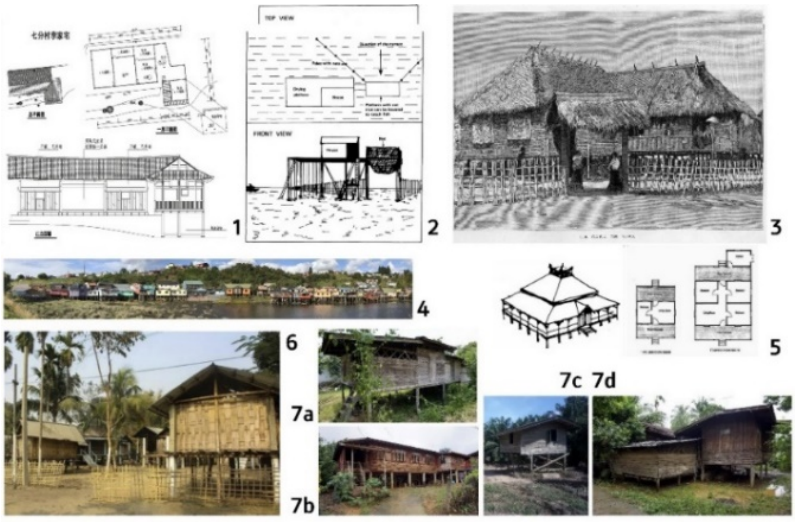


Figure 7. Stilt houses from different geographies: 1) “Diaojiaolou” in Quifen village of Keda township (XiaoHui and Jialong, 2011, p. 1262; 2) Kelong, (Collier, 1980, p. 38), 3) “Bahay Kubo”/ nipa hut, 1887 (Cabalfin, 2020, p.

50); 4) “Palafito” as a typical element of Chilotan architecture (Manríquez and Sills, 2019, p. 167); 5) Queenslander house with two and four-roomed plans (Bajracharya, Kumarasuriyar, and Demirbilek, 2003, p. 2), 6) “Chang Ghar” , Missing-tribe (Ravishankar, and Ji, 2021, p. 958; 7) Thai stilt house types with a) wooden roof structure,15cm-diameter- a) round wood columns, wood walls, and wood floors (upstairs), and earth ground (downstairs), b, c) square wood columns; d) square concrete columns section 20 × 20 cm and concrete floor slabs on ground (downstairs) (Charoenchai and Bhaktikul, 2019, pp. 90-91).

ELEVATED ARCHITECTURE IN VISIONARY ARCHITECTURE

As Arnheim expresses, an elevation of a building displays the relation of the space (the building) to gravity. As buildings embody “a fundamental relationship to the earth, whether trying to soar and leave it or comfortably rooting to it”, visually, verticality relies on unimpeded directionality of the upward vectors, and a weakening of the centric unity of the façade while conversely a rooted visual quality gives in to this centricity but goes further to win some downward vertical extension” (Verstegen, 2005, p. 55). One of the ways to test the limits of their medium is to create the illusion of defying gravity. “Without gravity, such basic concepts as “floor”, “wall”, and “ceiling” lose much of their meaning. It seems reasonable to expect that the state of gravity in an environment should have a significant influence on its architecture” (Hall, 1995, p. 182). Human beings mostly adapted to their environment by “preferring to walk most comfortably on horizontal planes and resting the body ultimately by lying down on horizontal beds”. However, gravity meant “a nemesis for the kind of architecture that wants to exist in absolute freedom” (Latif, Amjad, Amjad, and Haider, (n.d.)).

The elevation of the body, such as “climbing a tree” or “a ladder” enables a perception that the body “is striving to overcome a counterforce”, which is located in the body, “as weight. Elevation of the body “consists in the conquering of one's own inert heaviness for obtaining a high goal-an experience inevitably endowed with symbolic connotations”, as it for example “climbing is a heroic liberating act; and height spontaneously symbolizes things of high value, be it the value of worldly power or of spirituality. To rise in an elevator, balloon, or airplane is to experience being liberated from weight, sublimated, invested with superhuman abilities. Besides, to rise from the earth is to approach the realm of light and overview (Arnheim, 1977, p. 34).

The idea of raising buildings significantly from the ground was frequently discussed by architects and city planners such as Buckminster Fuller and Italo Calvino in the context of utopian and visionary architecture. In 1960, Buckminster Fuller and Shoji Sadao proposed the construction of a 1,6-km-diameter thermal airship, “Cloud Nine”, a project for Floating Cloud Structures. The proposal consisted of a megastructural geodesic sphere and a habitat for several thousand people, becoming airborne when heated by sunlight and floats freely in the atmosphere, providing as mobile and migratory life. (Baldwin, 1997, p. 190). These “seagoing and air going

environment controls are floatab[le] and flyabl[e] weight-considerate and semiautonomous" as they "generate their own power, or "desalinate their own water" (Fuller, 1981, p. 90).

Similar to futuristic projections, the megastructures in which spatial urbanism was dependent on lightness emerged in contrast to the modern paradigm in which "sprawl, heaviness, and immobility" (Modena, 2011, p. 133). According to Calvino and his inspiration source—the French school of visionary architecture—also known as urbanisme spatial (spatial urbanism) and megastructuralists, the architecture of lightness has been linked to utopia (Modena, 2011, p. 133, 134). Calvino thought that "the proliferation of weight-defying images during the eighteenth century", such as "ingenious ways to reach the moon", or "figures suspended in air", "was directly connected to Newton's laws of attraction and gravity" (Modena, 2011, p. 34).

Calvino's forefront fiction of elevated cities can be observed in "Invisible Cities" (1972), exposing a fragmented narrative. In his book, Calvino addressed the idea of "lightness" (Modena, 2011, p. 134). For example, Esmeralda, as a trade city, "embodies in its very topography all that an educated vision requires to counteract perceptual flattening". In Esmeralda, the "lightness of superelevated passageways, their ups, and downs, between lit bridges and suspended roads", recalls Venice, according to a scholar (Modena, 2011, p. 116). Another city, Octavia, "is a "spider-web city" that swings over an abyss, tied with ropes to two mountain tops—its precarious situation opposed to earthly gravity". The city is over the void between two steep mountains with "two crests, with ropes and chains and catwalks" (Modena, 2011, p. 151). As Schöffer states, Calvino refers to the concept of lightness in his book "Six Memos" by referring to Milan Kundera and Nietzsche: "We flee [our] weight" as "today we are entering the era of elevation and freedom from the force of gravity". Architectural elevation enhances "intellectual and physical efforts by combining the neurochemical effects of higher altitudes with the effects of exposure to light or "the potential of antigravity treatments, or "cures d'apesanteur", like astronauts' trips to the moon, to remedy the psychological and physical maladies caused by modern life" (Modena, 2011, pp. 142-143).

Another elevated architecture projection is that of Frederick Kiesler's idea of "liberation from the ground, abolition of the static axis" for his functionalist architecture (Kretzer, 2017, p. 43). In 1956, Friedman manifested mobile architecture (Manifesto de l'Architecture Mobile) in a CIAM congress as "a system of construction that allows the occupants to determine the design of their own dwellings. He later expanded this idea for mobile architecture to the "idea for creating elevated city space where people could live and work". The reason behind this idea was to "restrain the land use of growing cities" to provide "the compactness of the city", such as Ville Spatiale, which "was based on a structure easy to modify, a structure not necessarily raised over the ground level, keeping that option open if wanted. Friedman also detailed the technical feasibility of his ideas, including "a suspended subway (cable-metro) to connect the different parts of his city quarters with each other and with the rest of the city", and "the floors of the elevated construction were to

hang between towers that serviced the access and necessary supplies, lines, and pipework. He also worked out an optimum for the size of a city" (Friedman, (n.d.)) (Figure 8).

Figure 8. Yona Friedman's "L'Architecture Mobile" series (Arellano, 2019).

CONCLUSION

Beyond the technical and utilitarian needs to resist the forces of nature, especially after the Industrial Revolution, the lightening of the building materials used, their ability to pass through larger openings, and the contact of the buildings with gravity have led to relative independence of these structures from the ground by cutting an optical relationship. While the elevated architecture provides a convenient and harmonious approach to natural conditions, it also created various symbolic and semantic openings.

The idea of "detachment from the ground" emerged and became visible with modern architecture. With modern architecture, elevated architecture was designed to make the figure/ground relationship more visible and to dominate nature, and this has increased architecture's autonomy. The modern paradigm implied that buildings were heavy and had static properties, despite emphasizing lightness, such as being raised by piloties, and that a human-made structure was different from nature. The idea of elevated space was seen in many works realized or that remained as paper architecture in the 1960s architecture, such as in Fuller and Sadao's work, the mobile architecture of Friedman-inspired by the works of megastructuralists and Calvino's works. As showing a consciousness of gravity and the earth, elevated architecture reinforces the verticality of our experience of the earth and making us "aware of the depth of the earth", while at the same time allowing us to imagine "levitation and flight".

Therefore, this article examined the history of the idea of detachment from the ground on a theoretical basis, focusing on perceptions and senses,

taking the example of elevated architecture and freeing elements against gravity in three different levels of elevation; flying stairs, cantilevers, and stilt structures, later discussing the examples of elevation from Calvino to megastructuralists. The missing relation with the ground in architecture creates a rupture and differentiation in the relationship of architectural space and its user with the ground as a metaphor. Elevated architecture creates features such as being able to see the surroundings better, being more emphasized, and being more dominant, both for protection from natural conditions and technical needs, as well as for semantic and symbolic needs and emphasis.

REFERENCES

Akurgal, E. (1970). Ancient civilizations and ruins of Turkey: From prehistoric times until the end of the Roman Empire. İstanbul: Mobil Oil Turk A.Ş.

Arellano, M. (2019, March 10). A selection of the most representative drawings by Yona Friedman. Retrieved from https://www.archdaily.com/912823/a-selection-of-the-most-representative-drawings-by-yona-friedman?ad_medium=widget&ad_name=related-article&ad_content=934231.

Arnheim, R. (1977). The Dynamics of Architectural Form. Berkeley and Los Angeles: University of California Press.

Aksu, H. (2006). Musalla Taşı. In İslam Ansiklopedisi, 31 (pp. 232-233). Türkiye Diyanet Vakfı. Retrieved from https://cdn2.islamansiklopedisi.org.tr/dosya/31/C31010133.pdf.

Alix, A. (2012). Using wood on King Island, Alaska. Études/Inuit/Studies, 36, (1), 89-112. doi: 10.7202/1015955ar.

Bajracharya, B. N., Kumarasuriyar, A. C. & Demirbilek, N. (2003). Vernacular architecture in Queensland, Australia: Current planning issues and opportunities. In Proceedings International Conference on Quality of Urban Life: Policy versus Practice. İstanbul: İstanbul Technical University Urban and Environmental Planning and Research Center.

Baldwin, J. (1997). BuckyWorks: Buckminster Fuller's ideas for today. New York: John Wiley and Sons.

Batur, A. (Ed.). (2005). Doğu Karadeniz'de kırsal mimari. (S. Bulutsuz, Trans.). İstanbul: Milli Reasürans T. A. Ş.

Cabalfin, E. G. (2020). Bahay Kubo as iconography: Representing the vernacular and the nation in Philippine post-war architectures. Fabrications, 30(1), 44-67. doi: 10.1080/10331867.2020.1721054

Charoenchai, O., & Bhaktikul, K. (2019). Structural durability assessment of stilt houses to flash flooding: Case study of flash flood-affected sites

in Thailand. Environment and Natural Resources Journal, 18(1), 85-100. Doi: 10.32526/ennrj.18.1.2020.09.

Ching, F.D.K. (2014). Building construction illustrated (5th ed.). Hoboken, New Jersey: Wiley.

Ching, F.D.K. (1995). A Visual dictionary of architecture. New York: John Wiley and Sons.

Collier, W. L. (1980). Preliminary observations on two sea fishing villages in Sumatra and Kalimantan. Indonesia Circle. School of Oriental & African Studies. Newsletter, 8(22), 33-54. doi: 10.1080/03062848008723788.

Dalyan. (n.d.). Eski İstanbul fotoğrafları arşivi. Retrieved from http://www.eskiistanbul.net/tag/dalyan/.

Davies, N., & Jokiniemi, E. (2008). Dictionary of architecture and building construction (1st ed.). Oxford: Architectural Press.

Ertl, A. W. (2008). Toward an understanding of Europe: A political economic précis of continental integration. Florida: Universal-Publishers.

Farnsworth (n.d.). History. Retrieved from https://www.farnsworthhouse.org/history-farnsworth-house/.

Foster, G. L. (2004). American houses. Boston: Houghton Mifflin.

Friedman, Y. (n.d.). Mobile architecture. Retrieved from http://www.yonafriedman.nl/?page_id=225#:~:text=Friedman%20expanded%20this%20idea%20for,people%20could%20live%20and%20work.&text=He%20also%20worked%20out%20an,the%20living%20space%20they%20wanted.

Fuller, R. B. (1981). Critical path. New York, N.Y.: St. Martin's Press. Retrieved from https://archive.org/details/criticalpath00full.

Hall, T. W. (1995). The architecture of artificial gravity: Theory, form, and function in the high frontier. In B. Faughnan (Ed.), Space Manufacturing 10 pathways to the high frontier proceedings of the twelfth SSI (pp. 182-192). Space Studies Institute (SSI) and American Institute of Aeronautics and Astronautics (AIAA). Retrieved from http://www.artificial-gravity.com/SSI-1995-Hall.pdf.

Harris, C. M. (2006). Dictionary of architecture and construction. (4th ed.). New York: McGraw-Hill. doi: 10.1036/0071452370.

Karpuz, H. (1999). "Serander" ve "Loft": Türk ve Norveç halk mimarisinde eşdeğerli iki yapı. ODTU MFD, 19:(1-2), 71-82.

Kretzer, M. (2017). Information materials: Smart materials for adaptive architecture. Switzerland: Springer.

Lee, M., & Reinhardt, G. A. (2003). Eskimo architecture: Dwelling and structure in the early historic period. Fairbanks: University of Alaska Press and University of Alaska Museum.

Manríquez, C, & Sills, P. (2019). Evaluation of the energy performance of stilt houses (Palafitos) of the Chiloé Island. The role of dynamic thermal simulation on heritage architecture. In Simulation-Virtual and Augmented Reality 2 (3), ECAADe 37 / SIGraDi 23 (pp. 158-169).

Mellaart, J. (1967). Çatal Hüyük: A Neolithic town in Anatolia. Sir M. Wheeler (Ed.). New York: McGraw-Hill.

Mellaart, J. (1964). A Neolithic City in Turkey. Scientific American, 210(4), 94-105. Retrieved from https://www.jstor.org/stable/pdf/24936081.pdf?refreqid=excelsior%3Abaf252b5008a3e3cd01833f1ad8dcd11.

Moffett, M., Fazio, M. & Wodehouse, L. (2004). A World history of architecture. London: McGraw-Hill.

Modena, L. (2011). Italo Calvino's architecture of lightness: The utopian imagination in an age of urban crisis. New York, Abingdon, Oxon: Routledge.

Nováková, I., Durıanová, A. (2018). Closer to heaven: The tradition of above ground burials in Western Anatolia. In P. Pavúk, V. Klontza-Jaklová, & A. Harding (Eds.), Ευδαιμων Studies in honour of Jan Bouzek (pp. 179-200), Edition: Opera Facultatis philosophicae Universitatis Carolinae Pragensis XVIII. Prague: Charles University, Faculty of Arts and Masaryk University.

Pallasmaa, J. (2006). An architecture of the seven senses. In S. Holl, J. Pallasmaa, A. Perez Gomez, A. (Eds.), Questions of perception: Phenomenology of architecture (pp. 27-38). San Francisco: William Stout.

Pilloud, M.A., Haddow, S. D., Knüsel, C. J., & Larsen, C. S. (2016). A bioarchaeological and forensic re-assessment of vulture defleshing and mortuary practices at Neolithic Çatalhöyük. Journal of Archaeological Science: Reports, 10, p. 735-743. doi: 10.1016/j.jasrep.2016.05.029.

Ravishankar S., & Ji, S. (2021). Exploring two housing typologies in the vernacular architecture of Assam. In A. Chakrabarti, R. Poovaiah, P. Bokil, & V. Kant (Eds.). Design for Tomorrow, 1. ICORD 2021, Smart Innovation, Systems and Technologies, 221. Springer: Singapore. doi: 10.1007/978-981-16-0041-8_78.

Latif, R., Amjad, Z., Amiad, H., & Haider, G. (n.d.). Awakening the architectural sensibilities: "Gravity the ever-present nemesis". Retrieved from https://www.researchgate.net/publication/308778922_Awakening_the_Architectural_Sensitivities_Gravity_the_ever-present_Nemesis.

Rudofsky, B. (1964). Architecture without architects, An introduction to nonpedigreed architecture. Garden City, New York: The Museum of Modern Art. Doubleday.

Sun Moon, K. (2019). Cantilever architecture. New York and London: Routledge.

The Editors of Encyclopædia Britannica. (n.d.). Cantilever. Retrieved from https://www.britannica.com/technology/cantilever.

Ullmann, F. (2011). Basics. Architecture and dynamics. (K. Lum, A-Vienna Trans.). Wien: Springer-Verlag/.

Verstegen, I. (2005). Arnheim, Gestalt and art: A psychological theory. Wien: Springer-Verlag.

Wilson, D. (2013a, May 25). 20130525 05 Farnsworth House. Retrieved from https://flickr.com/photos/davidwilson1949/10030217744/in/photostream/. Attribution 2.0 Generic (CC BY 2.0).

Wilson, D. (2013b, May 25). 20130525 05 Farnsworth House. Retrieved from https://flickr.com/photos/davidwilson1949/10030283216/. Attribution 2.0 Generic (CC BY 2.0).

XiaoHui, L. & Jialong, J. (2011). Sustainable development of Tujia people's “Diaojiaolou” house in southwest of Chongqing. In International Conference on Multimedia Technology (pp. 1261-1264). doi: 10.1109/ICMT.2011.6002809.

A READING FROM *KADINLAR DÜNYASI* ON THE VISIBILITY OF WOMEN IN THE PUBLIC SPACES OF LATE OTTOMAN ISTANBUL

Hatice Gökçen ÖZKAYA[1], Derya DÜZGÜN[2]

[1]*Süleyman Demirel University, Turkey*
gokcenakgun@yahoo.com
[2] *Süleyman Demirel University, Turkey*
deryaaduzgun@gmail.com

ABSTRACT

For the Ottoman Empire the 19th century was a critical period which involved many changes in terms of economical, political, social and cultural aspects where innovations and reforms were discussed. In that century where such changes happened Ottoman's public space borders also changed and were re-set. In the Ottoman society the definition of public space, its borders and the relation it had with the private space have always been open to question. The public space concept which became intricate for the Ottoman society also brought up an even more complicated issue for women who were not the subject in shaping the history, always being secondary in the male-dominant culture and who were left out. Especially along with the changes occurred during the 19th century, the appearance of women in the public spaces and places gained a new dimension.

Having been marginalized and left out from the history, women were ignored and became invisible due to the fact that the historiography was under male domination. Gender roles-imposed women certain duties such as marriage, motherhood, houseworks etc. and made them associated with house which was rather defined as a private place. Therefore, women were cast out of the public space. However, women got out of their marginalized status and became much more visible in the new public spaces with the modernization starting as of the 19th century. In this context, trying to understand in which public spaces and places women became visible from the magazine, *Kadınlar Dünyası* in which Ottoman women made their voices heard and were able to express themselves forms the basis of this paper. The paper has tried to identify which public places were opened to the usage of women, how they were experienced and what kind of restrictions they had.

Key Words: Women; Public Space; Late Ottoman; *Kadınlar Dünyası*; Visibility

INTRODUCTION

Having been ignored and marginalized throughout the historical continuance women's experiences of public space always indicates a tense situation. Women have been associated with private space for centuries and in that time their relations with the public space were seen as a considerable threat. Private and public space arrangements determined according to the gender roles lie behind this. In order to address socio-spatial restrictions of women in the public and private space level social practices, experiences and behaviors must be analyzed. Because spatial distinctions exist within the culture that builds this society. Understanding how experiences, restrictions or violations of women were defined and interpreted in relation to the public space will only be possible with breaking these cultural codes. This paper focuses on in which public spaces and places and how women were visible. It tries to identify which public places were opened to the usage of women, how they were experienced and what kind of restrictions they had. In this scope, the *Kadınlar Dünyası* magazine was used as the primary material in which women took the opportunity to express themselves. Readings from the *Kadınlar Dünyası* magazine contain a lot of data regarding women's experiences of public space. With the reading done by tracing physical places from the *Kadınlar Dünyası* magazine, this paper, will make open to the discussion relations of women who were not the subject of the history and were under the dominance of male historical discourse with publicity in their daily life practices and in which way they were visible in the public spaces.

The Public Space of the Ottoman Women

While the space which was defined as a geometrical notion in the coordinate system in the past could not be addressed with the dimensions of historicity and socialization, it was defined as a complex, social product or a building process with Lefebvre. (Lefebvre, 2016) Beyond the physical existence alone, the space gained a value which could not be considered independent from the human factor in which daily life practices were experienced, complex social ties were established, cultural codes were produced and resolved. Hence, it can be said that the relationship between the individual and space is a chain that transforms and feeds each other mutually. Against the transformation of individual by space, individual's setting the borders of the space within the framework of his cultural codes is not independent of each other. Therefore, understanding and comprehending the space is just possible by resolving cultural codes special to the social dynamics which the individual experiences. In addition, the space is a social production process along with a supervision, and thus a means of domination. The gender concept the domination brought with is one of the main categories for the historical analysis of the space. Accordingly, the distinction based on gender roles led to the identification of socialization places used in the daily life practices with their users and resulted in individual's determining himself and his identity. (Doğan, 2021) The interaction between gender roles has a certain impact upon the production of cultural codes for the space. Beyond doubt, the distinction between the usage of public and private spaces is not

only sought in the definitions of physical boundaries but it also refers to the gender norms and makes them meaningful. Given that the public and private spaces are shaped by certain gender-based cultural codes existing in the society's memory, it can be suggested that the gender transforms spaces with its determining effect on the space.

The interaction between women and space can be read from the definitions of public and private space in the most clear way. Therefore, since the subject of the study is women it is necessary to analyze the distinction between public and private space and their definitions in the context of Ottoman society. In the Ottoman society the definition of public space, its borders and the relationship it had with the private space have always been open to discussion and this cannot be read based on a binary opposition. According to the Habermas' (2005) definition, public space is a space which is open to the use of everyone regardless of the individuals' age, gender, ethnicity or physical characteristics. While the private space is a space which is offered as an alternative to the public space and which includes the relatives of the individual and that individual shapes inside it and its dimensions. However, boundaries between public spaces and private spaces are not fixed and they are re-produced after being constantly changed by social actors' daily life practices. In the Ottoman society, boundaries between public and private spaces were ambiguous in a way that cannot be considered oppositely. Ottoman's public life and private life were intermingled and between these two areas there are countless intermediate values. While there was no private space clearly distinguished from the public space, also there were not clear boundaries that distinguish the public space from the private space as well. In line with this fact, it can be said that in the Ottoman, public life was private just as much as being public. (Tanyeli, 2007) The public space concept which became intricate for the Ottomans was even more complicated issue for women who were not the subject in historiography, always being secondary in the male-dominant culture and who were left aside.

Women had a tense relationship with the public space all the time. Women became dependent on the household defined as the private space because of the fact that over centuries the most important gender role attributed to women was motherhood. Cultural codes produced in the household defined as the private space-imposed women some duties such as marriage, houseworks, motherhood etc. and made them excluded from the public space. (Güven, 2016) Women were limited with the private space and otherized by being neglected and left out of the history. Also, works regarding the private space were not included in the history and the women labour was ignored; therefore, women labour was intermingled with daily life. (Savran, 2010) So, the underestimation of women labor reinforced women's invisibility and tense experiences they had in the public space where the gender codes were produced. Furthermore, certain roles imposed to women such as raising a generation, being a good wife and mother also formed an ideological boundary which held the women within the limits of private space. Because women have the responsibility for both the social reproduction biologically and the continuity of cultural codes. On the other hand, from past to present men also have had gender roles

independent from the household and the gender roles attributed to men resulted in their domination over the public space. This distinction presents a framework that enables us to explain daily life practices and socio-spatial restrictions of women put in the background in the male-dominant culture. (Tuncer, 2015) In the 19th century where a range of changes from economical, political, social and cultural aspects happened and innovations and reforms were discussed for the Ottomans, public and private notions were re-defined and re-produced in the Ottoman society as a contrast. Boundaries of public and private space were re-set and they were re-shaped by gender roles diffusing in the space. Particularly, once the *Tanzimat Fermanı* was proclaimed, renovation movements spread starting from Istanbul and it laid the groundwork for women's movement after women started to question their place in the society. That is, having been kept within the private space boundaries before, women began to be visible with their different public space experiences in the history.

During the modernization period, women's education was so important for the women's relationship with the publicity in the Ottoman Istanbul. Young girls in the Abdulhamid II era got out of their households defined as private spaces and started to be visible in the public spaces through primary and secondary schools for girls (*İnas Mektepleri)* and teacher's training schools for girls (*Dâr'ül-Muallimat*) that gave service as of 1870. (Doğan, 2021) However, there is an important issue here. Although women's education was supported by modernization, actually women could not give way to their housewife identity based on the traditional culture. Because the purpose of the education that women had by getting out of their households was in fact making them good mothers, wives and Muslims so that they could raise good citizens for the next generations. On the one hand, the education system contributed to women's becoming free and publicly visibly but on the other, the quality and content of the education kept women within the boundaries of private space. This situation contributed to the patriarchal gender regime existing in the historical continuity. In this context, in the curriculum for men the topics included scientific thinking, political management, philosophical movement etc. while in the girls' curriculum there was an education model in which the roles of traditional mother and housewife were constantly repeated. According to Doğan (2021), the focus of the education given in this period was getting women out of the households by not detaching them from the private space and also not alienating them from public spaces as well. Hence, it would not be right to consider spaces for the education with their physical existence alone. Those spaces were also the places that brought an intangible meaning which ensured the continuity of an ideological structure for the imposition and internalization of gender roles at the same time. In this regard, even spatial arrangements were designed based on maintaining this continuity. There were various arrangements concerning how women would use or not use those spaces.

In the Ottoman's modernization period, education was not the only way for women to become visible in the public space. Women started to actively communicate with each other depending on the development of media and gained the opportunity to recognize new facilities with modernization. So

that women expressed themselves both organizationally and individually and spoke out the problems in their daily life practices. (Çakır H. , 1997) In addition, with reference to the women's visibility in the public spaces which were new for the Ottoman society such as theaters and cinemas, associations and communities, conferences, concerts, exhibitions, clubs etc. a range of news and adverts were included in the magazines and newspapers published in that time. Those public spaces getting widespread by modernization was the reflection of women in the city. Women transformed and re-defined both the spaces and themselves by experiencing places that they had not used until that time and by socializing there. Once the *Tanzimat Fermanı* was proclaimed, four important theater buildings were opened in Istanbul. Two theaters served for a long time in especially the Pera district of Istanbul which were Naum Theater and French Theater and their announcements were on the almost all magazines and newspapers. (Baydar, 2020) Those theaters were new public spaces that helped to accelerate modernization movement in the Pera district and revive the cultural and artistic life there. Also, in addition to the theater plays opera, concert and cinema events were performed in those places. However, even though new public spaces started to be opened, Muslim Istanbul residents were stranger to those places which they did not experience before and they had hesitations. For that reason, media organs adopted the mission to introduce those places to Istanbul residents, explain the rules of etiquette and communicate necessary information such as practices for using those kinds of places in the daily life. Istanbul residents followed the announcements of cinema, theater events and shows and the adverts of those places on the newspapers and magazines published weekly or daily and obtained information about places. In that period where women were expected to be good wives and mothers, experiencing those new places points to a tense situation for women. Although theaters, cinemas or concerts were cultural and artistic events, it should be considered that they were not independent from the ideology and those events function as a way of discourse for the gender roles. Therefore, spatial organizations arranged for women and men in those places provide insights about how gender roles were perceived in the minds.

In the same period using media organs actively, political changes in the Ottoman Empire and practices of free thought adopted with those changes considerably affected the experiences women had in the public spaces. It is seen that women actively took part in addressing social issues. Women associations established with different purposes were other public spaces that reflected the visibility of women. This period corresponds to the nation-state period where nationalism ideology got into the stage of history. The mission of Turkish women highlighted in the associations established with political reasons was a new ideological role for women. This organization that women demonstrated in a nationalist manner was not independent from the private space as mentioned before. Their political participation and visibility in the public space was again related to the women's mission of raising a good generation. (Güven, 2016) This time, the ideal role given to women in the public spaces was making the cultural transfer from the past to the future in the best way as the Turkish women. So that Ottoman women gained a new identity on their nationality and started to be visible in the

public spaces through those associations. Places in which those associations' organizations were held also give important clues about the subject. When reviewed the issues of *Kadınlar Dergisi* magazine it was seen that generally the associations had a center and some branches under this center. This shows that women's own organizational experiences became widespread and expanded in Istanbul. Also, conferences held by those associations were carried out either in the branches of associations or places of women education. In fact, women made themselves heard by getting out of the private spaces and took part as political subjects in the places where they also gathered with other women. Apart from that, *salon* meetings were held and those *salons* opened a different window contrary to which is known about boundaries of private and public space. That is, some prominent women made those places periodic meeting halls by inviting their intellectual environment to their household which was their private space. Hence, by making *salons* of their houses public, they brought what was spoken in the associations to their houses. While *salon* meetings reflect the permeability of public and private spaces, the publicity here describes a controlled space which is under the full supervision of women where they invited their private guests and it is notable in this sense. (Tataryan, 2021)

For exactly the same reasons, when reviewing women's public space experiences, it would be misleading and incomplete if the private space experiences and relationships associated with women's gender built on cultural codes. Therefore, while reviewing women's visibility in the public space, it was considered how they established a relationship with the private space and how they fed from it as well. Public space boundaries of women kept in the background in the male discourse throughout the history are under the domination of private space produced by the cultural codes created for themselves. In this scope, in the remaining part of this study, women's visibility in the public space was reviewed on *Kadınlar Dünyası* magazine and it was sought answers to the questions of which public spaces were opened to the usage of women, how the boundaries of those spaces were determined and how they were fed from the private space.

Ottoman Women's Public Space Experiences: *Kadınlar Dünyası*

It is seen that in the Ottoman society women who made themselves heard through media organs, gained a chance to express themselves, become publicly visible and organized started to actively took part in the historiography by the *Tanzimat* period. The first periodical published directly for women in the Ottoman was *Terakki-i Muhadderat* which was a supplement to the *Terakki* newspaper between 1869-1870. With *Terakki-i Muhadderat* Ottoman women started to pass from passive position to the active position in their social life and discussed the ways of being more visible in the public space than before. (Akgün, 2008) However, this women magazine was published just for 48 issues and did not last long but constitute the beginning for the women movements. Afterwards, *Hanımlara Mahsus Gazete* which was important under the historical and sociological conditions became a media organ that paved the way for the women movements. (Güven, 2016) But in the late Ottoman society, *Kadınlar*

Dünyası, which was a long running women magazine, can be defined as an arena for the women movements, where the ideologies of feminism and nationalism started to grow together. *Kadınlar Dünyası* was the magazine with the most radical ideas compared to the other women magazines of that time in terms of women organizations. *Kadınlar Dünyası*, which had significant impacts on the Ottoman women and played an important role in the organization of women, was a media organ of *Osmanlı Müdafaa-ı Hukuk-ı Nisvan Cemiyeti* and was published in order to inform women about the works of this association, the developments within the society and to reveal women's opinions clearly. (Yılmaz, 2009) From the first issue of *Kadınlar Dünyası*, the fight for women rights in the Europe and America was followed closely, the books that women needed to read and review were mentioned and the seeds of feminism were planted. *Kadınlar Dünyası*, expressed the gender discrimination between women and men whenever possible and caused the women to question their role in the society. Even in its first issue it was stated that women were perceived as 'a fruit or commodity' in the eyes of men. (Demircioğlu & Yılmaz, 2009) (Çakır S. , 2016) Therefore, almost all the issues included texts written in order to set women free from men's captivity, make women question the life they were obliged, make them take the responsibility and control of their lives. Also, *Kadınlar Dünyası*, published as 195+5 issues between 1913 and 1921, was significantly different from others because its founder and editorial staff were all women. In this respect, since its editorial staff was all women and women directly expressed themselves by playing active roles in the historiography it enables to review women's public space experiences at first hand. In the *Kadınlar Dünyası*, it is likely to see many examples of public spaces and places that the Ottoman women experienced with modernization and those spaces' boundaries and interiors. In this context, the selection from the magazine provides important information regarding the 's transformation of women's public lives in that time.

The magazine firstly gave wide coverage to the topics such as women's education and participation in the working life which were so important in terms of Ottoman women's relationship with the publicity. That is to say, according to the general mission of this magazine from which lots of clues were obtained regarding how women experienced the public space through education, the only way and resolution of getting free from male domination was giving girls and women education. In the texts included in the magazine, it is seen that works were carried out for the girls and women to receive education and the request for opening sufficient number of schools and institutionalization was stated at all times. In addition, it is frequently seen the announcements of conferences held for educational purposes. Places for those conferences were generally women's education buildings of *Darülfünun* or *İnas mektepleri* halls. However, it was encountered with conferences that were held in the associations and communities established by women organization sometimes. In the context of women's publicity, places and dates of those conferences as well as the emphasis on the announcement texts that the conference was special for ladies. In such a period where the dominant understanding considered that each woman's primary duty was to give birth to a child, feed and raise them this topic was frequently repeated in the magazine as well and the educational policy of

the state was in line with this. Hence, the content of the announcements in the magazines supported this dominant understanding. In the 35th and 36th issues of the magazine a conference held by the *Umumi Konferanslar Cemiyeti* can be an example to this situation. The content of the conference held in the hall of *Darülfünun* was *İslâmiyet'te Kadın (*Women in the Islam). It can be said that this conference held for the women's education, imposed a mission of being a good Muslim woman. According to another announcement, the content of the conference was about the responsibility of parents for children's morals. Again, it is understood from the said announcement that the nature of the women's education had the mission of being a good mother. Therefore, although women became visible in the public space through the demand for education and formed a different socialization platform with other women, their presence in the public space was associated with the mission imposed on them in the private space.

Hanımlara Mahsus Konferans
Umumi Konferanslar Cemiyeti'nden

Şehr-i halin otuz birinci Cuma günü zevalî saat ikide, Darülfünun salonunda, Teali-i Nisvan Cemiyeti'nin tertip ve muaveneti ile Satı Bey tarafından "Çocukların Ahlâkıda Ebeveynin Mesuliyeti" hakkında hanımlara mahsus konferans verilecektir.

Duhuliye iki kuruştur. Hasılatı, cemiyetin ihzar etmekte olduğu irtisam vesaitine sarf edilecektir. On yaşından küçük çocukların getirilmemesi rica olunur.

Figure 1. Demircioğlu & Yılmaz, 2009, Transcription Text

Activities of associations and communities were also important regarding the women's education. In the second issue of the magazine, regulations of *Osmanlı Türk Hanımları Esirgeme Derneği* founded for providing moral and material assistance to the *İttihat ve Terakki Kız Sanayi Mektebi* was published. (Demircioğlu & Yılmaz, 2009) According to this, it was stated that the women's education should not be limited with Istanbul only and it was emphasized that girls should have education if necessary.

Bir şey öğrenmek için mutlaka onun bulunduğu yere gitmek lâzımdır. Yoksa öğrenilmesi matlûp olan şeyi lâhuti bir kuvvet getirip aklımıza sokmaz. Bundan anlaşılıyor ki itilâmız için Avrupa'ya gidip öğrenmekten başka çare yok...

Figure 2. Demircioğlu & Yılmaz, 2009, Transcription Text

This condition is a clue regarding how women's education rights expanded their public space boundaries. On the other hand, it was not agreed by all the authors that women should go to the Europe to receive education. Authors who disagreed with this opinion argued that it was not possible to go to Europe for the sole purpose of receiving education and women would travel around if they had gone there. Therefore, as it is seen the publicity provided for women could only be obtained within the framework of certain supervisions and limitations and it did not allow differences and unexpected encounters.

Bendeniz Avrupa'yı asla görmedim. Lâkin göreceklerin öğreneceklerini size pekalâ tarif edebilirim. Kızlarımız Avrupa'da bulundukları müddetçe sakin oldukları apartman veya daireden çıkıp doğruca sakin oldukları daireye gelecekler ise buna bir diyeceğim kalmaz. Lâkin bu mümkün değildir. O halde elbet iki üçü bir olup, haydi hemşire bu akşam Bulvar dö Zitalyen'de veya Bolonya Ormanı'nda biraz dolaşalım, diyecekler ve böyle bir teferrüç de kendilerinden dirig edilmeyecektir. Şu ufak gezinti esnasında... Artık daha ziyade tasvire hacet yok zannederim...

Figure 3. Demircioğlu & Yılmaz, 2009, Transcription Text

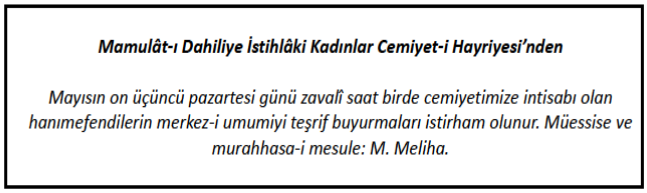
Other than the education, another area where we can see that women were involved in the public space was associations and communities. In the said period, political transformations in the Ottoman Empire paved the way for women's organization. Particularly, *Osmanlı Müdafaa-i Hukuk-i Nisvan Cemiyeti* was an organized political movement and performed works for changing women's position in the social life. This situation is so important for opening the publicity of women to discussion. On the other side, this association stated in the written form that as women they would not claim any right in any political environment. This shows that women were not actively involved in the politics yet. The sole purpose of this association was to increase the welfare of women within the society, organize their working lives and trying to raise their cultures to the top level. So, women started to communicate with each other in a more different way than before and had an important transformation for experiencing the public space, but the boundaries of this experience were defined and determined, too. Moreover, in that period the fact of being a Turkish citizen brought with the nationalism was dominant throughout the state and women became visible in the public spaces with the mission of being Turkish Women accordingly. The ideal role defined for women through associations and communities was the mission of Turkish women from now on.

Derneğin en esaslı ve mühim gayesi bütün Osmanlı ve Türk hanımlarının kuvayı maddiye ve maneviyelerini bir merkezde insıbap ettirmektir.

Figure 4. Demircioğlu & Yılmaz, 2009, Transcription Text

In the third issue of the *Kadınlar Dünyası*, it was published that the country's women met and discussed on their country and nation in the conference held in the conference hall of *Darülfünun*. In the published news, it was read that women expressed their opinions about the deteriorating state of the country although they did not actively take part in the politics. (Demircioğlu & Yılmaz, 2009) Also, in another issue *Mamulât-ı Dahiliye İstihlâki Kadınlar Cemiyet-i Hayriyesi,* which was an association organized by women, announced a declaration. In this declaration, the admiration towards the industry and trade network representing Europe's welfare is notable. In this scope, in order to make women participate in the industry and trade network, it was announced on the association's behalf that women could use tailor houses and sew any kinds of clothes. (Demircioğlu & Yılmaz, 2009) Moreover, in the later issues it was advertised the national sewing clothes in the *Ahmet Terzi* store, so it shows that women production was encouraged. (Demircioğlu & Yılmaz, 2009) Besides, this association's

meetings were also announced in the magazine: Since this association was not meeting periodically once in a week like *Osmanlı Müdafaa-i Hukuk-i Nisvan Cemiyeti*, meetings were announced int he magazine with the date and venue each time.



Mamulât-ı Dahiliye İstihlâki Kadınlar Cemiyet-i Hayriyesi'nden

Mayısın on üçüncü pazartesi günü zavalî saat birde cemiyetimize intisabı olan hanımefendilerin merkez-i umumiyi teşrif buyurmaları istirham olunur. Müessise ve murahhasa-i mesule: M. Meliha.

Figure 5. Demircioğlu & Yılmaz, 2009, Transcription Text

Mamulât-ı Dahiliye İstihlâki Kadınlar Cemiyet-i Hayriyesi was not the only association that was meeting by the announcements in the magazine. It is seen that a conference to be held in Kanlıca in a branch of *Osmanlı ve Türk Hanımları Esirgeme Derneği* was announced in the 27th and 29th issues. (Demircioğlu & Yılmaz, 2009) Those announcements also demonstrate that associations and communities did not have a single center and they had branches in different places to reach almost all women. This indicates that within the context of relationship with the publicity it was moved on to new phase was and the boundaries expanded further. In addition, when reviewed the trip announcements in the magazine, it is seen that associations not only gathered in certain places but also they organized trips and tours sometimes. For instance, trip to the *Hereke* factory organized by the *Mamulât-ı Dahiliye İstihlâki Kadınlar Cemiyet-i Hayriyesi* mentioned in the 99th issue is very important. (Demircioğlu & Yılmaz, 2009) Because it was announced that they would not only visit the factory but also take a bosphorus tour with the boat and have a meal in the buffet organized in the boat. Such trips refer to a new public space for the Ottoman women; women started to be present in a space where they encountered with someone they did not know and not just the ones they already knew from now on.

Another announcement in the *Kadınlar Dünyası* make us question the boundaries of public and private space. This announcement in the 9th issue was about women's meeting in the Mrs. Nezihe Muhlis' conference hall to have a conversation for discussing their current problems. According to this, the said conference hall was likely in the Mrs. Nezihe Muhlis' household. The subject of publicity of private spaces that we observed in Nora Tataryan's works regarding the *salon* meetings held in the women's households in the early republic period also applies for the conversation in this announcement. Although it is rarely seen in the magazine, a situation like in this announcement demonstrates that the boundaries of public and private spaces were in fact re-formed in each special condition. It shows that households could be opened for different publicities and they were transforming through women.

Within the Ottoman's daily life practices, other new public spaces in the 19th century were cinemas and theaters. Those spaces started to be active regularly with the usage of new technological equipment and became the

places where women could be visible. But on the other hand, the nature and content of theaters annoyed many authors. In the first issues of the magazine, announcements published for the winter theater under the administration of Monsieur Seryoski in Kadıköy brought countless arguments. In the letters written for the magazine, there were criticism that all the theaters were about love but neither of them mentioned patriotism or current political issues. In the magazine, gradually increasing number of theaters were mentioned regularly under the title of *Temaşa Hayatı*. In those articles, staged plays and performers were reviewed. Finding announcements and reviews related to the theaters in a magazine for women shows that women used and interpreted those kinds of spaces. Also, considering the announcements it is possible to reach women's boundaries of public spaces through the theaters. According to the announcement in the 99th issue, a play staged in Erenköy was shown to women just in the daytime whereas the cinema arranged via the cinematograph was shown to both women and men just in the night time. It was emphasized in the announcements that theaters performed in the daytime were spacial for women while cinemas in the night time were not only special for women. This indicates that the public events held in the daytime were open to the just women's participation but the public events held in the night time were open to the participation of women with their husbands. It seems that in the public space organizations, the spatial reflection of the discrimination between genders was privatization of certain times of the day.

Valide Mektebi Menfaatine

Erenköyü'nde valide mektebinde bî-kes kızlar menfaatine Erenköy tiyatrosunda Mınakyan Efendi tarafından Temmuz'un 21. cuma günü yalnız hanımlara fevkalâde bir oyun verilecektir. Gecesi de hanımefendilere ve erkeklere sinema ile menazır ve hissi dramlar irae olunacaktır.

Figure 6. Demircioğlu & Yılmaz, 2009, Transcription Text

After the theater and cinema, another public space that can be considered new within the Ottoman society's daily life practices was concerts. Those concerts defined as large and perfect were generally given by foreign pianists. In an announcement published in the 21th issue of the magazine, there details of a concert to be given by Miss Vanda Panopulo who was one of the most talented pianists of the city in Union Fransez, Beyoğlu. However, in this announcement, there wasn't any limitation that the participation in the concert was special for women or men. Therefore, it is still unknown how those concerts were performed as a new public space experience. Furthermore, in the 99th issue there was an announcement for a musical that a military band would perform in a school for girls (*İnasa Mahsus Şemsü'l Mekatib*). (Demircioğlu & Yılmaz, 2009) This announcement contained details of a program that would last all day. That is, in the intervals of the music performances a range of conferences from teaching manners to children to the duties of a family. A footnote in the announcement provides significant opinions for women's public space experiences. According to this

footnote, the program was performed in the diligently arranged garden of the school and it was open to the participation of both women and men. But one point draws attention. Entering to and exiting from the garden were organized separately for women and men. Women were entering the school from the Cihangir gate while men were entering from the gate on the street. Therefore, this discrimination defined on the entrances implies that the garden was organized separately for the two different genders. As a result, although it can be said from the all-reviewed announcements that women were more visible in the public space, this visibility and publicity could not be independent from the private space like it could be for men and public spaces were shaped by different supervisions and restrictions.

CONCLUSION

In the paper, a reading was carried out regarding public spaces which were selected from *Kadınlar Dünyası* magazine and used by women of that time in order to analyze the relationship women had with the publicity in the late Ottoman period as well as taking an active part in the historiography and gaining visibility. While women's visibility tends to increase in the historiography and public spaces, there is a tense relationship especially between women and public space dynamics and together with the modernization, the boundaries between public and private space were re-shaped in the context of publicity and women started to establish different relationships with publicity in this respect. Readings conducted through a long-running women's magazine on the visibility of women enabled to understand for which reason, under which conditions and domination the women who was ignored and left out, became visible in the public space.

When the data in the *Kadınlar Dünyası* was analyzed the most striking effects of the visibility of women in the public space can be read on th education. With the education policy in that period, women gained an opportunity to experience the new public spaces that were developing quickly in the city by modernization. Women became publicized by getting out of their households defined as private space to have education or by expressing the problems of their daily life practices on the magazines and newspapers. Women participated in new public spaces as an active subject such as associations and communities, conferences, theaters and cinemas, trips, concerts etc. Especially, participating in the associations and communities by organizing through magazines and newspapers points to a very important transformation. In order to reach all the women, associations and communities conducted their activities not only in the central buildings but they opened branches in different districts as well. Generally, they received education by participating in the conferences held in buildings of *Darülfünun* and *İnas Mektepleri.* In this respect, women's education was not limited with the provinces alone, opportunities for getting education in the Europe were always discussed, too. This forms an opinion about how women's public space boundaries expanded through associations and communities as well the education they received in the conferences. However, although it was stated that women got out of their private space and their visibility in the public space tended to increase, it cannot be said

they used the public space fully in the male dominant society. Women's usage experience of the public space could not be independent from the private space that they were captivated for centuries and again the private space supported women's public space experiences. Women were included in the public space to the extent the requirements and needs of the public space. Despite the fact that associations, communities, conferences started the women movements in the Ottoman by paving the way for expressing women's rights and demands, those rights and demands were for increasing women's activity in the private space. In the said conferences, the basis of the curriculum given to the women included being a good wife, a good mother and a good Muslim. The social role imposed to the women in the associations and communities was being a Turkish Woman due to the nationalism ideologies in that period. Considering the frame of the historical continuity, women's visibility in the public space was again for keeping the patriarchal society regime going.

Also, it was received information from the *Kadınlar Dünyası* about women's boundaries to use the public space. Women's way of using public spaces and men's way of using them were not the same. Given that within the historical continuity it was not suitable for women and men to be in the same place for privacy reasons, it is possible to say that the same condition applied for the usage of public spaces as well. For example, theater plays were performed as just for women or men, concerts were watched by women and men separately. In fact, sometimes entrances to the public space were organized in different places for women and men. While it cannot be made any comment whether women or men used the public space more effectively, it can be stated that the tradition within the historical continuity kept going in the public spaces, too. An announcement read from the *Kadınlar Dünyası* newspaper reveals the opposite of this. Conferences that some of the prominent women held in the conference halls (i.e. in their houses with private spaces) also destroyed the boundaries built between the public and private spaces.

As a consequence, this reading from *Kadınlar Dünyası* shows that women's visibility in the public space was more likely to increase than before in the late Ottoman and early Republic period. In addition, it was observed that women's experiences in the private space and the public space were intermingled inseparably. Women were stuck in the private and public spaces with unclear boundaries and this indicates that they were still otherized.

REFERENCES

Akgün, B. (2008). Osmanlı Kadın Kimliğinin İnşasında Terakki-i Muhadderat. Kayseri: Erciyes Üniversitesi Sosyal Bilimler Enstitüsü.

Baydar, E. K. (2020). 19. Yüzyıl Osmanlısında Avrupai Tarzdaki İcra ve Temsil Mekanlarına Dair. Müzikte Temsil Müziksel Temsil II, 149-159.

Çakır, H. (1997). Osmanlı'da Gazete Reklamcılığı. Ankara: Elit Yayıncılık.

Çakır, S. (2016). Osmanlı Kadın Hareketi. İstanbul: Metis Yayıncılık - Kadın Araştırmaları Dizisi.

Demircioğlu, T. G., & Yılmaz, F. B. (2009). Kadınlar Dünyası 1.-50. Sayılar Yeni Harflerle (1913-1921). İstanbul: Kadın Eserleri Kütüphanesi ve Bilgi Merkezi Vakfı.

Demircioğlu, T. G., & Yılmaz, F. B. (2009). Kadınlar Dünyası 51.-100. Sayılar (Yeni Harflerle) 1913-1921. İstanbul: Kadın Eserleri Kütüphanesi ve Bilgi Merkezi Vakfı.

Doğan, C. (2021). "Öteki" Modernleşme İstanbul'da Gündelik Hayat, Toplumsal Cinsiyet ve Marjinalitenin Sınırları (1830-1930). İstanbul: Kitabevi Yayınları.

Güven, Z. C. (2016). Eril Tarih Söyleminde Bir Osmanlı Kadın Kamusal Alanı: Hanımlara Mahsus Gazete. İletişim Kuram ve Araştırma Dergisi(43), 1-14.

Habermas, J. (2005). Kamusallığın Yapısal Dönüşümü. (T. Bora, & M. Sancar, Trans.) İstanbul: İletişim.

Lefebvre, H. (2016). Mekânın Üretimi. (I. Ergüden, Trans.) İstanbul: Sel Yayıncılık.

Savran, G. A. (2010). Kadınların Emeğini Görünür Kılmak: Marx'dan Delphy'ye Bir Ufuk Taraması. Praksis(10), 159-210.

Tanyeli, U. (2007). Kamusal Mekân-Özel Mekân: Türkiye'de Bir Kavram Çiftinin İcadı. Arredamento Mimarlık Dergisi(100+99), 58-64.

Tataryan, N. (2021). Geç Osmanlı'da Bir Kültürel Üretim Mekânı Olarak Salon. (2. S. Sunumları, Performer)

Tuncer, S. (2015). Dışarı Çıkmak: Özelden Kamusala Feminist Bir Saha Hikâyesi. Hacettepe Üniversitesi İletişim Fakültesi Kültürel Çalışmalar Dergisi, 2(2), 30-58.

Yılmaz, S. (2009). Dvrin Kadın Edebiyatına Katkısı Bakımından Kadınlar Dünyası Dergisi. Yüksek Lisans Tezi. İstanbul: İstanbul Üniversitesi Sosyal Bilimler Enstitüsü.

POSTHUMAN SPACE / USER EXPERIENCE IN ANTHROPOCENE AGE

Bedriye Begüm NAZLI ERAP[1], Mustafa Kemal YURTTAŞ[2] ,
Füsun SEÇER KARİPTAŞ[3]

[1] Haliç Univertsty, Turkey
bbegumnazli@gmail.com
[2] Haliç Univertsty, Turkey
mustafayurttas@halic.edu.tr
[3] Haliç Univertsty, Turkey
fusunsecer@halic.edu.tr

ABSTRACT

The shaping of the spatial experience with the effect of the human-centered perspective becomes a critical discussion topic in the design of symbiont spaces. Since the beginning of humanity, design has been based on human needs and positions the human at the center all over the world.

Today's world is becoming a place shaped by social, economic and political decisions of people.

This formation, which is called the Anthropocene age shows the fact that humans are othering the nature according to their own priorities. At the same time, it is possible to say, this age created a simulation area under the influence of humanity and was shaped by human behavior in time.

The person in question, has turned into a cyborg figure, and taken on a new posthuman form in nature-culture hybridization, both as an individual and socially in the changing age. In this context, it is necessary to examine a 'Us' structure consisting of human and non-human as a question of self & other, and to approach the space experiences by considering the posthuman as a user.

In art, design and architecture; understanding what this new posthuman form is in the Anthropocene, considering human behavior and habits, and examining the relationship between human (and posthuman), space and nature are the main research topics.

In the paper, this issue is especially emphasized, and the connection between human and space is examined in response to the destructive influence of the changing age. The results of the research define the propositions that will minimize the negative factors may occur in terms of architectural life and design in the Anthropocene by considering human-space relationship and user experience.

Keywords: Human and Space; Posthuman; User Experience; Anthropocene Architecture; Nature and Culture.

INTRODUCTION

While the effects of the crisis created by global climate change and depletion of resources are questioned all over the planet, it is remarkable that the creative subject is the new hybrid human figure. The human being, who shapes the space according to life practices and experiences, makes the earth a designed place especially in an architectural context. In that case, considering the human as a cyborg in the balance of destructive and constructive technology is a significant factor for multidisciplinary design areas. Also, it is useful to evaluate the entropy and negentropy of developing technology in a spatial dimension. Today these concerns and questions in the pursuit of ecological balance are being treated as a cumulative issue for a sustainable world in the many researched branches. While this designed simulation space has an advanced lifestyle with technology, making it livable for future generations constitutes a fundamental concern. At the same time, human centered design is regarded as primary at the point of ideal design and falls into a contradiction in itself with the effect of the posthuman movement in ideology of the modern world. As the user of both an object and a space, human beings take place on the stage as both the designer and the user of this new world.

The Spatial Perception and Human

Since the beginning of his existence as a social creature, man comprehends a space in line with his body and mind, creates and experiences the space by perceiving it. Space as a fiction or fact; It is the result of the practice of perception and experience. At this point, space is a production that is the output of a design process. The produced space is defined by Lefebvre as; *"For the moment I merely wish to point up the dialectical relationship which exists within the triad of the perceived, the conceived, and the lived."* (Lefebvre, 1991) The trio provides the opportunity to make sense of the production of space and to examine the experience of space in every production style and society, as well as to examine the interrelationships, oppositions and arrangement of mental, social and physical spaces. (Ghulyan, 2017)

Here, space is shaped as a result of a formation and transformation depending on cultural factors arising from experience and interaction. Herein, the world as a perceived and designed space becomes a new man-made space. (Figure 1)

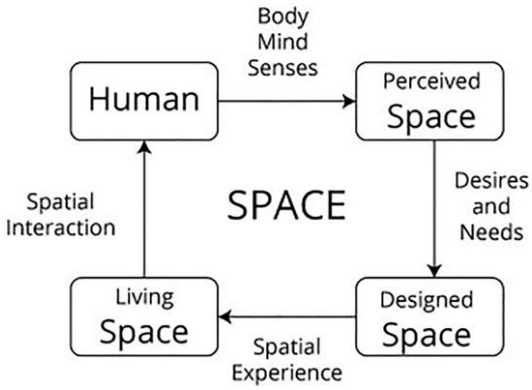


Figure 1. Association of Human and Space

Human as User in the Anthropocene

Nature / Culture Interaction

It is observed as an approach that has gained a place in world cultures that that the presentation of all living things and nature on earth to human service forms the basis of today's ecological problems. Nature has been under threat as a result of a human-centered thought that has been colonized in the name of man's own life, culture and development. However, existence in nature continues with the co-creation and dereving of living things. At this point, instead of taking man and nature as two categories, it should be remembered that man is a part of nature and cultures are formed by the interaction of human and non-human. (Çelik, 2019)

It is clear that every consumption-oriented mentality based on breaking the symbiosis in this interaction threatens the planet. One of the leading theorists in the field of nature and cultural politics, Donna Haraway has been concerned with the question of “How to live well on a vulnerable planet that is not yet murdered?” (Heater, Turpin, 2015) Haraway expresses that, nature and technologized culture cannot be separated from each other, and the symbiosis between people and others should be evaluated collectively.

It is an undeniable fact that technological devices have become a necessity in life forms of nature and culture. In this symbiosis, technology has become second nature. Another theorist, Rosi Braidotti, who mentioned that technology is second nature in the consistency of nature-culture interaction, explains this symbiosis as follows: “Moreover, our culture has moved even beyond this biopiracy (Shiva 1997) and its global proletariat on to more advanced mastery of living matter—through synthetic biology, stem- cell research, gene- editing, robotics, and bioengineering. Today, we re-create

lifelines by codes of a biogenetic and informational nature. Writing and editing code is what we do best. Technological mediation is our second nature—from de- extinction to genetically modified food, Facebook, and WikiLeaks" (Braidotti, 2017)

Braidotti refers to the interaction of material integrity between human and nonhuman through the inclusion of technological artifacts. However, theorists who disallow the distinction between nature and culture have expressed this unity in different forms: "naturecultures" – Haraway, "media ecologies" – Fuller,

"medianatures" – Parikka, "terrestrial materialism" – Braidotti. As a result of the rejection of the humanist concept of male human in line with post-human thought, the need to replace the concept of anthropocentrism with the relational integrity of human and non-human has arisen.

Nature/Culture/Technology/Human Hybridization in the Anthropocene Age

The Anthropocene is a way of framing time; it offers a means for characterizing a new epoch defined by human impact on the geological, atmospheric, and ecological processes occurring on Earth. (Heater, Turpin, 2015) The Anthropocene term is called by different names (Anthropome-Macfarlane, Chthulucune - Haraway, Capitalocene-Moore and Anthrobscene - Parikka) by different thinkers, at the same time, it may be possible to say that this age created a simulation space under the influence of humanity and was shaped by human behavior over time. Although this age doesn't seem formalized yet, it is obvious there is a destruction in the relation of nature and culture caused by methods in solutions of human needs in multi design areas such as, city, industrial and especially architecture. In this nature and culture relation, vital behaviors, objects and spaces used are under the influence of artificial systems not only structurally but also environmentally. While the transition to the Holocene Age is observed from the beginning of agriculture to urbanization, today; It can easily be said that we live in the Anthropocene Age as a result of many factors such as an effect expressed as anthropogenic climate change and nature-culture hybridization. Now that humans – thanks to our numbers, the burning of fossil fuel, and other related activities – have become a geological agent on the planet, some scientists have proposed that we recognize the beginning of a new geological age, one in which humans act as a main determinant of the environment of the planet. (Chakrabarty, 2009)

In Chakrabarty's Four Theses, when these resource consumptions and climate change are examined; basically, it is mentioned that human being has ceased as a biological agent and has become a geological agent. The geological evolution of the planet and the geological evolution of humanity in the Anthropocene create a new 'Us' subject.

Today, concerns about minimizing the negative effects created by humans are also seen in the search for spaces that will create a symbiotic link between artificial and natural designed by humans. In the context of the body and space, the human turns into a figure of cyborg in a natural or artificial environment. A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. (Haraway, 1991)

According to Haraway, the cyborg, which is the combination of the organic and the technological, is an active subject that creates the new social structure and the design of needs. By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism in short, cyborgs. (Haraway 2006)

Today's cyborg figure is socially designing a new ‘Us’ and the vital web.

The border between human and non-human is gradually disappearing, and all dualities such as the agent-victim relationship and the utilitarian-based subject-object relationship are questioned between nature and culture. This system, which is called symbiosis, can also be considered as the harbinger of ‘Us’, which is formed by a new combination of nature and culture in a new world.

Hybrid User: The “Us” Experience

Values that create ‘Us’ in the post-human approach occurs in the interaction of. designed brains and bodies and also systems living in organic and technological coexistence. In order to understand the transformation that we are in and the evolutionary process that brought ‘Us’ to this process, individual and social stories and experiences need to be measured. Many more models are thinkable and feasible, if ‘we’ collectively choose to experiment systemati-cally with the project of what ‘we’, the differently located posthuman subjects of the anthropocene age, might be capable of becoming. (Braidotti, 2013)

On the other hand, Chakrabarty, who deals with the society at the point of climate change and global mobility on the planet, while discussing ‘We’, he gives an example of Weisman's 'World Without Us' experiment:

“Suppose that the worst has happened. Human extinction is a fait accompli. […] Picture a world from which we all suddenly vanished. […] Might we have left some faint, enduring mark on the universe? […] Is it possible that, instead of heaving a huge biological sigh of relief, the world without us would miss us?”] (Chakrabarty, 2009)

At this point, it is a matter of constructing and experiencing a world where there will be another ‘We’ and another architectural space and instead of the place where there will be no ‘We’ that we know until now. The discipline of history exists on the assumption that our past, present, and future are connected by a certain continuity of human experience. (Chakrabarty, 2009) So, thinking about the concepts of experience and user experience may provide an opportunity to observe the formation of the other architecture.

Experience as a whole; It is a phenomenon that acts in parallel with the user's perception, cultural factors and natural interactions. The concept of user experience defines the process over the user's perception of the space with its multi-sensory aspects, interaction with the objects in space and repeat this practice. Accordingly, the experience of man to meet his vital needs and the experiences of man who has turned into a today's cyborg figure should be examined in the main factor that creates the symbiosis between natural and artificial.

The new requirements that come with technology, the transforming Earth and the way of life create a cycle that composes new experiences. Here, user experience becomes a design process which has spaces and objects are produced on it. Architectural and interactive living spaces are concerned about being designed as spaces that sustain and complement the experience, just like virtual spaces and screens. Design deals with how things work, how they are controlled, and the nature of the interaction between humans and technology. (Norman, 2016) Therefore, when considering human as a user, anthropogenic sustainability can be evaluated through user experiences. In addition to this, human can be considered not only as a subject but also as a member of the mentioned new kind – 'We' with its environmental interaction as a posthuman. In this symbiosis, the reflection of the communication between human and non-human on the architectural space can also reveal new spatial experiences.

The Symbiont Space of "Us" in the Anthropocene

The effects of the Anthropocene on space have begun to be observed through both studies emphasizing climate change and architectural works over the human-space relationship equipped with technological data. Presenting the influences of the Anthropocene as a critical discussion in the intersections of art, design and architecture becomes a cumulative production area.

Figure 2. Blur Building – Diller & Scofidio (URL 1)

The common point in these examples is that they are interactive designs deal with humans and non-humans as users. Today, designs based on

virtual architecture is noticed among architectural space studies. Within the scope of virtual architecture and hypersurfaces, Blur Building, a media pavilion built for the Swiss Expo Fair 2002, can be considered as an architectural example. (Figure 2) The structure that appears suspended in the air in a man-made artificial fog cloud is called atmospheric architecture. The structure, which provides the experience of virtual and real in daily life over the human mind and body, also touches nature-culture through water.

The design transforms the idea that life would not exist without water into an architectural structure with an interactive space experience. By serving all the world's waters in the bar on the top floor, besides the fact that water is the main material of the building, it also interacts with the consuming user. Diller and Scofidio, the architects of the building, expressed this as "People can drink the building". (Blur Building., n.d.) From another point of view, the wearable technology element smart raincoats, which are given to the visitors before entering the building, make the visitors an active participant. Raincoats enable the communication of users not only with the building but also with each other by collecting data that is developed as depending on the behaviors of the participants and responding to the spatial experience. With this wearable technology system, this architectural structure includes cyborg / posthuman interaction in an order where technology is second nature.

As a study in similar approaches; Contemporary artist/architect Olafur Elliasson, who designs interactive space experiences, has an installation called Symbiotic Seeing. (Figure 3) The exhibition which deals with the interaction of all human and non-human figures in the world with each other, creates a space of experience that focuses on common life. The artist produces critical works that focus on instant user experiences, especially on issues such as the climate crisis and the depletion of planetary resources.

Figure 3 – Symbiotic Seeing – Olafur Elliason (URL 2)

The project was located in a dark room which has many laser points and colored light slices on the simulated fog and the different output of the images was based on the user movements. Miniature vortices, currents,

and curlicues of fog swirl around above the heads of the visitors, reacting to the body heat and motion of the visitors standing beneath the fog to involve them directly in the production of their surroundings. (Eliason, O. 2020) On the basis of this exhibition, the effects of the Anthropocene on space are about symbionts that is shaped according to user experiences and behaviors.

From other perspective, the biodigital productions of architecture and design studio, EcoStudio can be considered as another example. The stuido has a large scale installation, photo.synth.etica which aims to accelerate solutions to global climate change by producing custom-made bioplastic containers made of micro-algae cultures that store the CO2 it captures from the atmosphere in real time. Overall, photo.synth.etica suggests that, 'in the anthropocentric age, a non-anthropocentric mode of reasoning, and deploying cutting-edge technologies based on digital and biological intelligence, could be at the core of urban design and stimulate our collective sensibility to recognise patters of reasoning across disciplines, materialities and technological regimes.' (Neira, J. 2018)

Figure 4 – H.O.R.T.U.S. XL – EcoStudio (URL 3)

By the same team; H.O.R.T.U.S XL project, which is the work of the same team refers to the Anthropocene age with the concept of bio digital architecture.

The digital algortihm based structure is produced as 3D printed blocks and photosynthetic cyanobacteria are integrated into individual biopixels on a biogel stage that form the biological intelligence framework of the system.

The structure supports metabolisms by photosynthesis and converts them into real-time oxygen and biomass. The density-value of each bio-pixel is digitally computed in order to optimally arrange the photosynthetic organisms along iso-surfaces of increased incoming radiation. among the oldest organisms on earth, cyanobacteria's unique biological intelligence is gathered as part of a new form of bio-digital architecture. Myers, L. (2019).

This man-made biological blend can be considered as a materialist definiton of symbiontism in today's coexistence of nature and technology. With this and similar studies that give answers to the ecological concerns that came with the Anthropocene, the concept of biodigital architecture has begun to be recognized as a production area that will shape the future.

CONCLUSION

The main factor of the Anthropocene, human takes place on the stage as a geological agent with the role of user figure who shapes the planet in. While all living things on earth belong to a symbiotic network, the relationship between human and space over the destructive effect of the human-centered approach is accepted as the main cause of new age: In this context, how can we propose an "other"-"architecture/space" outside the permanent values in the Anthropocene Age for "Us", which consists of human and non-human? In line with this basic question, in this study, the role of human in nature-culture hybridization, as an effect and experience were examined. In addition, ecological projections are mentioned about climate crisis and the new order of the use of planetary resources.

Accordingly, human who has hybridized and become cyborgs in nature, culture and technology have been approached as a user/participant and experiences related to the transformation of the user with the space has been examined. Focusing on the symbiote consisting of human and non-human, the concept of “Us” emerged as the collective subject of the new social structure. Through the researches, it is observed that the user's perception of space and interaction with the environment are the factors that shape the space.The effects of the Anthropocene were examined on examples with architectural and art-design studies through user experience in the relationship between human and space and depending on these reviews, it has been concluded that user experience is a common multidisciplinary factor between fields of architecture, art and design. From another point of view, the answers to the questions on the human-nature-culture relationship are in this combination of cybernetic and organic space.

The constructive or destructive factors of this association is directly proportional to how we perceive it and how we experience it. Observing the impacts of the Anthropocene in a spatial dimension will lead to productive designs of future. It is obvious that architecture will design the world of today and tomorrow as a consequence of presenting new structures by the combination of workforces in the multidisciplinary field and the development of approaches at different scales. Based on all of these, it was anticipated that a balance should be achieved between symbiosis and technology, which is considered as second nature, for the sustainability of the planet in

the renewed Earth. It has been suggested that in order to understand the new posthuman form in the Anthropocene and to be able to examine the notion of 'Us', it is necessary to consider human behaviors and evaluate the user's space/place experience. As a result, the path to be taken in art, design and architecture in the posthuman period will shape the world as a spatial design.

REFERENCES

Boyacıoğlu, C. (2017). Mimarlıkta Çevreci Yaklaşımların Antroposen Kavramı Bağlamında Tartışılması. İstanbul Technical University.

Blur Building. (n.d.). https://dsrny.com/project/blur-building

Braidotti, R. (2019). İnsan Sonrası, Pek İnsanca: Bir Posthümanistin Anıları ve Emelleri. Cogito, 79. https://doi.org/95-96

Braidotti, R. (2013). The Posthuman. Polity Press.

Braidotti, R. (2017). Posthuman, All too Human Memoirs and Aspirations of A Posthumanist. The Tanner Lectures Delivered at Yale University, 2–53.

Chakrabarty, D. (2009). The climate of history: Four theses. Eurozine.

Çelik, E. E. (2019). Yerkürelilerin Ortakyaşamı: Mevcut Ortaklıklar, Yeni Yaşamlar. Cogito, 57. https://doi.org/93

Çelik, E. E. (2018). Haraway'in Yoldaş Türleri Ve Ağ Ören Anlatılar.

Eliason, O. (2020). Symbiotic Seeing 2020.

Ghulyan, Husik. (2017). Lefebvre'nin Mekân Kuramının Yapısal ve Kavramsal Çerçevesine Dair Bir Okuma. Çağdaş Yerel Yönetimler Dergisi. 26. 1-29.

Haraway, D. 1991, A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century in Simians, Cyborgs and Women: The Reinvention of Nature, New York, Routledge,

Haraway, D. (2006). A Cyborg Manifesto Science, Technology, and Socialist - Feminism in the Late Twentieth Century. University of MinnesotaPress,.

Heater, D., & Turpin, E. (2015). Art in the Anthropocene. Open Humanities Press.

Lefebvre, H. (1991). Production of the Space. Basil Blackwell.

Neira, J. (2018). ecoLogicStudio fights global climate change with bio-digital urban curtain. https://www.designboom.com/technology/ecologicstudio-photo-synth-etica-11-09-2018/

Myers, L. (2019). https://www.designboom.com/art/ecologicstudio-urban-morphogenesis-lab-bio-digital-sculptures-centre-pompidou-france-02-20-2019/. https://www.designboom.com/art/ecologicstudio-urban-morphogenesis-lab-bio-digital-sculptures-centre-pompidou-france-02-20-2019/

Norman, D. (2016). The Design of Everyday Things. (No. 2013). Basic Books. https://doi.org/10.15358/9783800648108

Olafur Eliasson: Symbiotic Seeing. (2018). https://www.tanyabonakdargallery.com/publications/16/

Turpin, E. (2013). Architecture in the Anthropocene. Open Humanities Press.

Figure 1. Association of Human and Space (drawn by first the author)

URL 1: Blur Building- Diller & Scofidio (https://dsrny.com/project/blur-building)

URL 2: Olafur Elliason – Symbiotic Seeing (https://olafureliasson.net/archive/artwork/WEK110926/symbiotic-seeing)

URL 3: H.O.R.T.U.S. XL – EcoStudio (https://parametric-architecture.com/h-o-r-t-u-s-xl-astaxanthin-g-by-ecologicstudio/)

ALTERATION OF HOUSE IN TURKEY UNDER THE CONSTRUCTION OF MODERN FAMILY AND CHILDHOOD

Öykü Su SEZEN[1]

[1]Abdullah Gul University, Turkey
oykusu.sezen@agu.edu.tr

ABSTRACT

In this study, I examine the change in family structure and perception of childhood along with Turkey's modernization process, and how children's spaces emerged and evolved in residences in the historical process, depending on this change. The modernization trends that started in the 19th century caused the European culture and understanding to have serious effects on the Ottoman society. Intellectual developments in Europe since the early modern era have led to the reconstruction of the concept of childhood. Changes in the understanding of childhood also affected the family structure deeply and eventually caused the houses to change physically. As a result of the modernization practices experienced in the last century of the Ottoman Empire and the first decades of the Turkish Republic, the understanding of childhood and family structure in Turkey took a form similar to that of modern Western societies. Especially during the Second Constitutional Period and the Early Republic, the nuclear family and its modern residence were idealized and the modernization of both lifestyles and housing was accelerated. Accordingly, features of traditional housing forms such as functionality, privacy and decoration have also been included in the process of change.

Key Words: Modern Childhood; Nuclear Family; Modern House; Child's Invention; Family Structure.

Politics/ Policies/ Laws/ Regulations/ Ethics

Human/ Behavior

Technology/ Material/ Sustainability

Philosophy/ Theory/ History/ Discourse

Criticism/ Method

Identity/ Culture/ Tradition

Urban/ City/ Landscape/ Rural

Design

Interior Design

Conservation/ Transformation/ Re-use

Education

Arts/ Aesthetics

INTRODUCTION

The concept of childhood has been one of the most popular concepts of the last century for many disciplines. Especially in the second half of the 20th century, studies on the history of childhood gained weight. In the formation of this interest, the effects of industrialization and modernization and various concepts that radically changed social life, as well as the world wars, are also great (Sağlam & Neriman, 2016). Since the 15th century, the understanding that the child is different from the adult and has unique characteristics and needs had begun to settle with the ways of thinking such as the Renaissance, the Reform and the Age of Enlightenment, in which rationalism and science have come to the fore (Tan, 2019). The spread of nationalism movements to a wider geography, starting from Europe, has supported the increase in interest in children in almost all societies. It's because the child was then an important citizen for the state as a citizen of the future. It was a desired situation by the nation-state that the child receives a good education, develops in a healthy way and is loyal to his state (Akbaş & Topçuoğlu, 2009).

As the social importance of the child increases, the care and upbringing of children has become a more serious issue for parents. The large households and collective lifestyles of pre-modern societies began to disintegrate and become more individual, smaller units as the 20th century approached (Tan, 2019). The nuclear family, consisting of parents and children, met a social unit idealized by the state. This understanding began to be seen in Europe in the early period, and in the 19th century, it began to make itself felt in the Ottoman society. In the Ottoman Empire, where modernization was observed in every field, the developments in the field of education and health were related to the increasing social importance of the child. At the same time, taking Western lifestyles as an example was transforming family and individual relations in social life (Demirarslan, n.d.).

When the subject is Turkish modernization and the transformation of housing, a narrative that mansions were destroyed and abandoned with the collapse of the traditional extended family is an icon (Bozdoğan, 2002). It can be said that at the basis of this narrative lies a distinct theme encountered especially in the period's literature and memoirs (Akcan, 2008). According to Duben (2002), crowded family houses did not constitute the majority of the society, but were seen as a feature of the elite living in the city. Nevertheless, considering that modernization in Turkey has spread to the society starting from the upper class living in the city, this narrative may be useful to examine the transformation of the house with the change of family structure. At the same time, the high rate of housing for the nuclear family does not prove the existence of an idealized nuclear family in the modern sense. For this reason, the main focus will be on how this understanding affects the structure and use of the house.

The aim of this study is to examine how housing forms in modernizing Turkey were transformed around the idealized nuclear family concept and also how children's spaces emerged in houses in time. The process from the 19th century, when modernization efforts were intensified by the state and social transformations were experienced, to the 1930s, when the

modernization policies of the Republic were intense, will be discussed. In order to perceive the historical background of the change, 17th and 18th century Ottoman society and residence will also be examined. Due to the limited data available, the subject examined within the scope of the research will mostly be aimed at upper-middle class urban families. In this research, I will utilize archival sources such as newspapers and magazines and texts in secondary sources with an inductive approach.

Evolution of Modern Childhood Notion

The very first question in the history of childhood is how we can describe childhood as a period. The way of defining childhood had been changed by biological, social, even linguistic circumstances. While it could be accepted as a period before adulthood in general or between babyhood and adulthood, there had been several examples that societies describe many steps before adulthood (Ariés, 1962; French, 2020). Although definitions of childhood can vary according to geography and culture in a specific time, it had been modified over the decades. Regardless of the definition and boundaries of childhood, it describes a period of life. However, the interest and knowledge of this period was not always as great as in modern times. Therefore, the history of the change in perception of the concept of childhood is not clear in relation to the historical background of modernization. However, we can specify the beginning of the interest in the history of childhood as the second half of the 20th century, especially with the book *Centuries of Childhood* by Ariés, which is seen as a pioneer in this regard.

Philippe Ariés, in his book *Centuries of Childhood*, first published in 1960, states that the understanding of childhood in pre-modern times is different from today's perception (Ariés, 1962). Although the concept of childhood began to gain importance after the Enlightenment Age, especially in the 20th century, studies on childhood and its history increased with the interest in this subject. Developments such as industrialization, scientific developments, progress in the field of health and understanding the importance of hygiene in the 19th century increased the importance of the child. It’s because these have enabled both the decrease in child mortality and the child to be seen as an important individual for the future of the society. The effects of the world wars in the first half of the 20th century also increased the scientific studies on children (Sağlam & Neriman, 2016). Studies on the history of childhood began to take place in scientific meetings in the 1960s (Tan, 2019).

Ottoman Empire took after European societies where the nuclear family and modern childhood perception was formed earlier (Duben & Behar, 2014). In Europe, intense and striking changes observed in the 19th century can be traced back to the 17th or even the 16th century (Sağlam & Neriman, 2016). The change in this understanding started with the realization that the child is a different being from the adults and also has different needs. According to Postman (1995), the emergence of the printing press in the middle of the 15th century resulted in the separation of children from the world of adults.

Undoubtedly, the formation of modern childhood thought is in close relationship with modern educational institutions. When we look at the pre-modern societies, we see that education depends on religious institutions, regardless of East-West or Islam-Christianity. A series of developments in thought and belief systems in the Age of Enlightenment also triggered the change in childhood perception in Western societies. John Locke's rejection of the church's belief in original sin changed the outlook on the child. According to this understanding, the child is a *tabula rasa* that should be shaped and filled by authorities such as family, state and school. The views of Jean-Jacques Rousseau also contributed to the modern perception of the child as a being that needs to be educated (Akbaş & Topçuoğlu, 2009). The emergence of modern and formal education, accompanied by the above-mentioned considerations, has led the family to change along with the child; because the widespread use of formal education drew the attention of families to children. The family institution was responsible for both ensuring that the child attends school and supporting education alongside school (Postman, 1995).

Changes related to the concept of childhood in Ottoman society, like other modern developments, were a situation that started to show its effects in the 19th century. In the 18th century and before, it was the understanding of Islam that determined the process called childhood in the Ottoman Empire. In this case, we cannot talk about the absence of the concept of childhood in the pre-modern Ottoman society as in the West, because childhood was considered a different period according to the understanding of Islamic interpretation. However, the limits of childhood were generally narrower than those we accept in the modern world. Although the definition of the boundaries of childhood differed according to the period and person, it was generally related to reaching physical maturity and differed by gender. Defining the boundaries of pre-modern childhood was important for the practice of marriage and family building. Children could be married by their families from the moment they were born, but when the child reached puberty, it became clear whether the marriage would actually take place or not. Boys had the right to oppose marriage as soon as they became adults, while girls did not have the right to refuse marriages committed by their father or grandfather (Araz, 2000).

Although the basic indicators of the concept of childhood for Muslim families in Ottoman society are determined by the understanding of Islam, ending childhood at an earlier age than in modern times is more of a cultural understanding. Young marriages were also common among non-Muslim subjects. The relationship between the boundaries of marriage and childhood in society also shows the understanding of marriage and family institution. Since marriage in the Ottoman Empire did not bring the necessity of establishing a new household, it was not expected that the married couple would reach a sufficient level economically. The married couple usually lived in the house of the man's family, and in this extended family, the household authority rested with the man's father (Araz, 2000). Even when the young couple had children, the older generation in the house took care of the child and had the right to make decisions about them (Duben, 2002).

It was necessary to come to the end of the 19th century for changes in the age of marriage and family formation system in the Ottoman Empire. However, the change of practices and thoughts about childhood in society and the state began to be seen at an earlier date. In this regard, especially the developments in the field of education and health conditions seem to be decisive after the *Tanzimat*. Developments in the field of education arose from the requirements of modernization in line with the basic goals of the *Tanzimat*. One of the effective reasons for the opening of new and modern educational institutions was the emergence of bureaucracy (Duben & Behar, 2014). The child was an important asset for the future of the state (Fortna, 2016).Although the regulations in the field of education began to be seen in the first half of the 19th century, the most important was the *Regulations for General Education* made in 1869. According to this regulation, primary and secondary education has been determined as four years and primary education has become compulsory for both girls and boys. Afterwards, the opening of modern primary schools called *ibtidai* led to the continuation of education in a dual structure in the Ottoman Empire. The difference of modern primary schools from traditional primary schools is seen in the educational structure rather than the content. For example, in modern primary schools, students were sitting on desks, not on the floor (Okay, 2008).

In the 19th century, in addition to the education given at school, home education gained importance in two ways. The first was that mostly upper-class families hired governesses for their children. The aim here was for the children to learn the Western culture, mostly the French culture, which was popular in the Ottoman Empire at that time. Lessons were usually French, music and piano lessons, and French governesses were hired. In some cases, the child would go to the teacher's house to take lessons, and in other cases, the teacher would come to the child's home. The French governess is an individual who has an important place for the upper-class family life in the 19th century Ottoman narrative. The second development regarding education outside of school was that raising children began to be supported by scientific resources. According to this understanding, the education of the child should begin before school (Okay, 2008).

Developments in the field of health are among the factors that show the increase in the importance and interest given to the child, as in the field of education. As in Europe, infant and child deaths were common in Ottoman society. First of all, a healthy birth became important for both the child and the mother. For this reason, it was necessary to train midwives who helped birth with traditional methods. Thus, in 1843, a course was opened to provide education in accordance with modern medicine and which would later turn into a hospital. It was important for parents to be educated on this issue in order for children to be healthy. In the second half of the 19th century and at the beginning of the 20th century, methods for the protection of children against the diseases and improving nutrition conditions had become one of the frequently discussed topics in the publications of the period (Okay, 2009).

Modernisation of family and domestic space

The physical change of dwelling in the age of enlightenment and afterwards can be read with the change of family structure. In order to examine these two changes, first of all, it is necessary to take a look at what kind of relationship the house has with family life. Historians have explained this relationship with the concept of 'domesticity' (Kent, 1993). There are views that domesticity is linked to the prominence of the nuclear family (Miller Lane, 2007). "Domesticity, privacy, comfort, the concept of the home and of the family: these are, literally, principal achievements of the Bourgeois Age." (Lukacs, 1970).

The pre-modern residence was not a place belonging to the nuclear family consisting of mothers, fathers and children that seem ordinary to us today, but a public structure that served a larger group. The group using the residence could include family members with blood ties, as well as employees, distant relatives, and young people who were not from the family (Heynen & Baydar, 2005). Also, non-household guests contributed to the crowding of the house (Rybczynski, 1987). The change in the concept and structure of the family was associated with the change or emergence of concepts such as intimacy, privacy and individuality. Although the idea of home and family privacy arose earlier, it became more prominent, especially in 19th century Europe (Somerville, 1997). Residences had lost their publicity and started to become a private place for the family, where privacy was at the forefront. The importance given to privacy and the fact that the house became a family-owned private place caused the interior of the house to change. One of the important differences between European houses and Ottoman houses in the early modern period is the understanding of privacy. The rooms in European houses are far from the understanding of privacy as they provide access to other rooms, but the sofa, which is frequently encountered in Ottoman houses, provides privacy because the rooms are opened to this space (Faroqhi, 2005). For example, privacy in French houses is ensured by the inclusion of the corridor in the plan in the 18th century (Duben, 2002).

Pre-modern house did not have functionally or individually separated rooms. While a room fulfils different functions such as cooking, eating, sleeping, sitting, furniture was used in a small number and to meet multiple functions. A table, for example, allowed for writing when needed, preparing food, and then eating there (Rybczynski, 1987). This situation showed similar characteristics in European and Ottoman residences. For example, when looking at 16th century Istanbul houses, having a separate place for cooking was generally very unlikely, but it was more common in the homes of the wealthy (Akgün Özkaya, 2015). Again, a common situation in the Ottoman house was that a room served different functions in different time periods (Faroqhi, 2005). This situation may vary depending on economic conditions. Houses of the poor families were often small enough to accommodate a family—maybe even a single room (Duben, 2002). It is clear that it is difficult to talk about functionality in such a situation. In the homes of wealthy families, they were more likely to encounter rooms that met various functions, such as the *selamlık*, which allowed the man in the house to

entertain guests (Akgün Özkaya, 2015). However, extended families where several generations lived together were generally seen in the wealthy (Duben, 2002). In other words, these houses, which were larger and had more rooms, could have been arranged to accommodate several families.

According to Rybczynski (1987), it was first in the Netherlands that the residence became a family-centred space. According to Benjamin, individualization emerged at the beginning of the 19th century due to the separation of housing and workplaces, and related thoughts on the concept of 'home' began to change (Heynen and Baydar, 2005). It is worth mentioning that these changes have spread primarily among the bourgeoisie. In the industrial cities formed by industrialization, both the workshop-house of the pre-modern period gradually disappeared and the residences began to move beyond the boundaries of the city centre where the workplaces were located. These suburban homes, far from the workplace, close to nature, emerged as ideal residences of the ideal bourgeois life (Blunt and Dowling, 2006).

It was inevitable that the change that started in the residences in the industrializing cities of Europe would affect the Ottoman Empire, which took the West as an example for the modernization process. This change manifested itself primarily in big cities such as Istanbul and among the wealthy in the 19th century. On the one hand, social patterns and lifestyles were transforming, on the other hand, the physical environment was changing both at the urban scale and at the housing scale, and was becoming European. The emergence of apartments in Istanbul, which differed from the traditional Ottoman residence, took place in the second half of the 19th century. The apartments, especially seen in the neighborhoods where non-Muslims live, will become the main criticism element in the collapse of both the Ottoman house and the traditional family and lifestyles in time. However, the new apartments around Galata did not suddenly change all the features of the traditional Ottoman house. In these houses, the sofa could be found similar to its former form and function, or in a slightly changed form. The distinction between *harem* and *selamlık* had largely disappeared (Öncel, n.d.). The change in the status of women in society and the closer relationship between husband and wife were effective in the formation of this situation. With the adoption of the European understanding of family and marriage, issues such as the fact that couples became life partners and the man and woman spending time together attracted attention (Bozdoğan, 2002). The married couple's sharing of such sensuality and lifestyle was also evident in the change of child-rearing styles. Although the care of the child was mostly the responsibility of the mother, the father was now more involved in this issue (Duben & Behar, 2014). One of the important differences is that in the traditional Ottoman family, while the responsibility and decision authority regarding the child was in the upper generation, the parents were now in a closer relationship with their own children. Thus, the nuclear family model was beginning to settle in society.

More radical changes in Ottoman society, where Western lifestyles and family life began to be assimilated by the wealthy class in the 19th century,

began at the beginning of the 20th century, especially during the second constitutional era. The family issue became an ideological discourse by entering the interest of the state. In accordance with nationalist policies and top-down modernization trends, the new national family was at the centre of the new lifestyle. The liberation of women and their entry into working life during the war years and the increase in interest in children as seen in the previous section were important factors in the establishment of this new family and lifestyle (Toprak, 1993). Changes in the lifestyles and residences of urban middle-class families began to be seen at the beginning of the 20th century. For example, the fact that the family eats together and at a certain time indicates a modern situation. In wealthy families, men, women, and children could eat at different times. In the general society, the households ate at the floor table prepared in the middle of a room with a common function (Duben & Behar, 2014). The westernization of eating habits has led to the introduction of spaces such as the dining room or at least new furniture such as dining tables and chairs (Demirarslan, n.d.).

Another sign which shows that the concept of nuclear family started to emerge at the beginning of the 20th century is the age of marriage. We know from the fact that the average age of marriage for women has increased to 20, at least in big cities, which was mentioned in the previous section. One of the factors that led to this result was economic conditions. Before the 19th century, marriage did not require establishing a new household and providing for the family. Therefore, there was no objection to the marriage of children at a young age. However, by the 20th century, the understanding that the man to marry should be economically competent was established because the newly married couple would establish a separate house from the upper generation (Duben, 2002).

In the Republican years, the shrining of the nuclear family continued as a state policy. Not only the nuclear family, but also the house in which they lived was an important issue. Associating the small size of the houses built in the 1920s with the small size of the family gives clues about the change in the family structure and the house (Duben & Behar, 2014). The grand mansions of the past were iconic of traditional extended families and had no place in the new modern society. Instead, modern houses suitable for the nuclear family and where they would live in a healthy, happy and comfortable manner were exalted. In the 1930s, the ideals of modernization were the main themes in family life and housing, as in all areas. The ideals of the nuclear family were a working father, a mother who took care of her home and family rationally, and a healthy, strong child. A few examples of the equivalents of these ideals in housing can be given. In the summer house project that appeared in a popular magazine in 1939, it is mentioned that there is a terrace for the father, where he can spend time with his family and have a meal when he comes home from work (Bozdoğan, 2002).

The mother in the ideal nuclear family has a deeper relationship with the home. Although the developments since the 19th century brought great changes in the liberation of women and their participation in working life, in practice, the roles of housewife and mother were emphasized more. The woman was given the responsibility of arranging her home physically, along

with her identity as a good mother and life partner of her husband. She had to do this not in the traditional housewife role, but with scientific methods and in a fashionable way. Celal Esat Arseven's ideas on housing design in his book *Yeni Mimari* (New Architecture) reflect the spatial characteristics that both the family and the mother and child individually need in the house (Bozdoğan,2002


Küçük mekteplinin mesai odası nasıl olmalı?

Yalnız küçük hanımın değil ya, küçük beyin de evde kendisine mahsus bir odası olmak lâzımdır. Bu oda hem yazıhane, hem de arkadaşlarını kabul salonu gibi. Elçabukluğu marifetile kabili tahvil bir şekilde bulunmalıdır. İşte sade olmakla beraber, yapılması pek te o kadar pahalıya çıkmayacak tarzda bütün şeraiti haiz bir küçük mektepli odası... Meselâ lâvabo hizmetini gören bir köşenin süslü bir perde ile gözden kapatılabilir. Bu perde kadifeden olursa daha ağır düşer.

Pencerenin perdes gayet sade olmak gerektir.

Yazıhane de gayet sade.. Ayni zamanda sağda solda kitap koyacak gözleri vardır. Divan da gayet geniş ve alçak.. Yeşil, yahut sarı kadifeden.. Yalnız ön tarafları lâciverd dolanlarla kapatılmalı.. Bir küçük mektepli, böyle bir odası olunca, onu kendi zevkine göre pekâlâ döbemesini bilir. İlâve edeceği bir küçük tablo, bir vazo, bir biblo derhal odaya başka bir cazibe verir.

Figure 1. Newspaper article advising that the child should have a room of his own. From Küçük mekteplinin mesai odası nasıl olmalı?. (1932, November 1). Milliyet. p.5.

It is seen that a separate room is allocated for the child in the housing projects in the architecture publications and also newspapers of the 1930s. The newspaper clipping seen in Figure 1 describes how the school boy's room should be. According to the text, this room is not defined as a bedroom for the child, but as a space with more functions. It is an important development to design this room according to the needs and wishes of the child as well as having a space of his own at home. Having a bookcase and a desk in the room is necessary for the school child to study. At the same time, the fact that the child can host his friends shows that the room serves as a socializing place for him. In the text, it is said that if the child has such a room, he will know how to furnish it according to his own taste. It was then started to be accepted that the child needed a place of his own at home and made decisions about this room. The plan from 1931 shows the ground floor plan of the Park Apartment (Figure 2). The children's room is designed around the sofa together with the other night places. The plan is important in designing and specifying a featured room for the child.

It is debatable how much these ideals and the new life-new family understanding turned into practice, at least in the first half of the 20th century. The above-mentioned situations were generally valid for urban and upper-middle class families. At the same time, the glorification of the nuclear family and the modern housing suitable for it describes a situation that is desired, but we cannot assume that a large part of the society lives in accordance with this or has the opportunities to live. In the early 1930s, it is seen that both traditional and modern attitudes continue together in the housing projects published by *Arkitekt,* one of the architecture magazines of the period. A villa project designed by Architect Sedat Hakkı can be seen in the 26th issue of *Arkitekt* (Bir villa projesi, 1933). In addition to being designed for a family with many members and guests, this country house also contains elements that refer to traditional Turkish residences. In the 25th issue of the same magazine, there are two house projects belonging to Architect Bekir İhsan (Ev projeleri, 1933). One of these houses is designed for a nuclear family of 3 and the other for a husband, wife, child and mother-in-law. As can be seen, both traditional and modern family structures and housing designs continue to exist together. While there is sometimes more than one bedroom in the projects in *Arkitekt*, sometimes spaces designed directly as children's rooms are also seen (Figure 2). This situation shows that the child started to exist as an individual in the house in the 1930s.

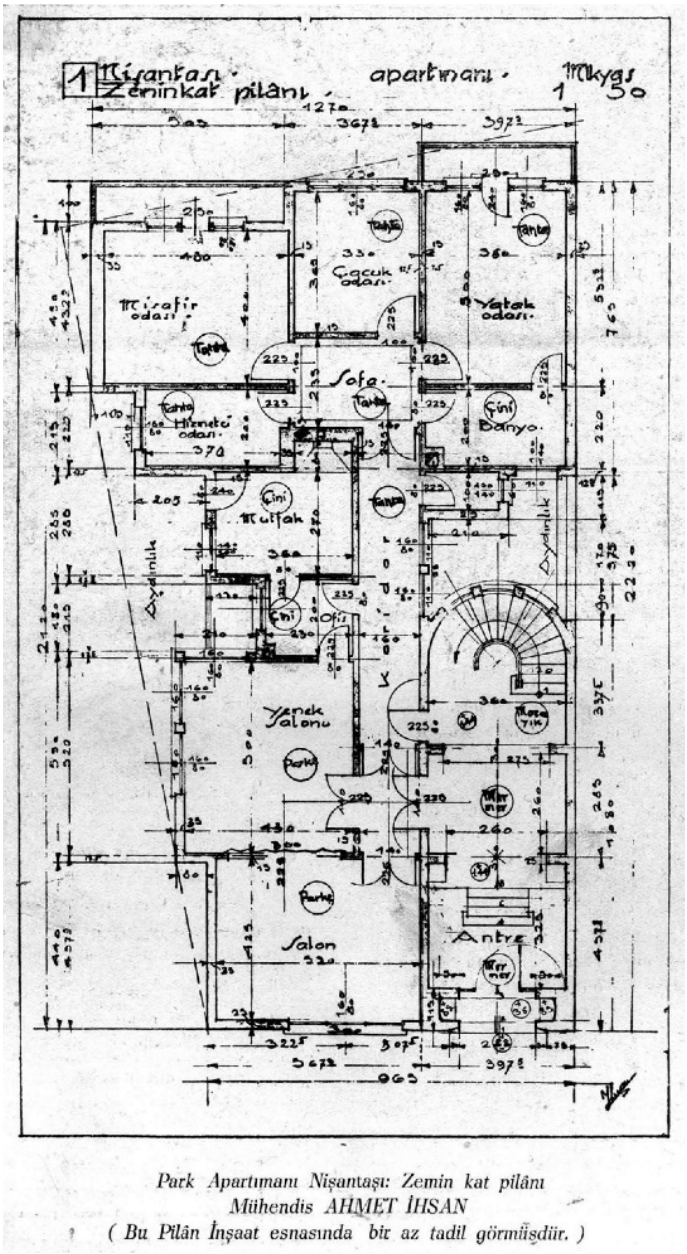


Figure 2. Ground floor plan of Park Apartmanı Nişantaşı by Engineer Ahmet İhsan. From Park Apartımanı Nişantaşı. (1931). Arkitekt, (1931-7), p. 220-223.

CONCLUSION

Housing structures that meet the shelter need, which is one of the basic needs of humanity, have changed and developed in parallel with technical, economic and social developments since the early ages. The physical structure of the house is directly related to the culture and life styles. A series of developments that started with the Age of Enlightenment also changed the home / dwelling both physically and socially. The most important change in this period is the differentiation of society's way of thinking. The modern nuclear family built by modern childhood thought has been a more and more accepted social unit since the 18th century.

Unlike pre-industrial societies, the concept of modern childhood is based on the idea that the child is different from the adult. There are several reasons behind the formation of the concept of childhood in modern societies. One of the important factors that create the concept of childhood is the changes in the education system. In pre-modern societies, children were seen as the younger adults doing the work of their families. The education system did not have a structure that prioritized the child and provided him with a systematic education and training process. According to Postman (1995), with the spread of formal education, the child has become the focus of the family. Thus, the nuclear family, which is at the foundation of the society, has become a child-centred formation. Child has become a social category that demands special attention for both physical and mental health because the continuity of the child's existence makes the family and therefore the society permanent.

Household is a notion that can explain the relation between the change of family structure and the domestic space. Household consisted of extended family members and also workers of house in pre-modern societies. According to Janeway (1971), these households gradually split into smaller groups and turned into nuclear families. One of the important elements that distinguished the nuclear family from the pre-modern extended family was privacy. That’s why the houses were not private places as in the modern sense. In addition to privacy, concepts such as intimacy among family members and individualization also contributed to the change of housing in the context of the nuclear family. These changes, which were experienced primarily in Western societies, such as the Age of Enlightenment, spread to wider geographies within a few centuries. While the 20th century was the century of childhood, houses were designed as domestic and private spaces where the nuclear family lived.

This study reveals how the social and intellectual changes about the family and especially the child had changed the housing spaces. Depending on the concepts of childhood and nuclear family in Turkey, the process of housing change started in the 19th century. This change is seen primarily in the establishment of Western lifestyles in society as a result of the state's emphasis on modernization practices in various fields. In the Second Constitutional Era and the one-party period of the Republic, the family and the child were important issues in the policy of the state. In this period, which we can describe as the first half of the 20th century, the nuclear family was exalted and the residence of this family was idealized. The new house

should be equipped with modern equipment and be able to meet the requirements of modern life. However, in practice, the realization of these ideals did not happen all at once. Most urban upper and middle class families have ideal residences and have assimilated the modern lifestyle. Even in this segment, it is still possible to see that traditional roles and forms continue together with modern lifestyles.

ACKNOWLEDGEMENTS

This study is a part of my master's thesis research, which is being carried out under the supervision of Assistant Professor Ahmet Erdem Tozoğlu in the graduate program of Architecture at Abdullah Gül University.

REFERENCES

Akbaş, E., & Topçuoğlu, R. A. (2009). MODERN ÇOCUKLUK PARADİGMASININ OLUŞUMU- ELEŞTİREL BİR DEĞERLENDİRME. Social Work & Society, 95-103.

Akcan, E. (2009). Çeviride modern olan: Şehir ve konutta Türk-Alman ilişkileri (Vol. 173). YKY.

Akgün Özkaya, H. G. (2015). 18. Yüzyılda İstanbul Evleri: Mimarlık, Rant, Konfor, Mahremiyet. İSTANBUL ARAŞTIRMALARI ENSTİTÜSÜ.

Araz, Y. (2000). 17. Ve 18. Yüzyılda İstanbul ve Anadolu'da Çocuk Evlilikleri ve Erişkinlik Olgusu Üzerine Bir Değerlendirme. Kadın/Woman, 13(2), 99-121.

Ariés, P. (1962). Centuries of Childhood: A Social History of Family Life. Alfred A. Knopf.

Bir villa projesi. (1933). Arkitekt, 1933 (26), p. 50-52.

Blunt, A., & Dowling, R. M. (2006). Home. Routledge.

Bozdoğan, S. (2002). Modernizm ve ulusun inşası: Erken Cumhuriyet Türkiyesi'nde mimari kültür (T. Birkan, Trans.; 1. Ed.). Metis Yayınları.

Demirarslan, D. (t.y.). Batılılaşma Sürecinde Türk Barınma Kültüründeki Değişim ve Konuttaki Yansımaları. Kültürel Değişim, Gelişim Ve Hareketlilik, 38. İcanas Kongresi Bildirileri, 209-220.

Duben, A. (2002). Kent, Aile, Tarih. Iletişim Yayınları.

Duben, A., & Behar, C. (2014). İstanbul haneleri: Evlilik, aile ve doğurganlık, 1880-1940 (N. Mert, Trans.). Boğaziçi Üniversitesi Yayınevi.

Ev projeleri. (1933). Arkitekt, (25), p. 17-18.

Faroqhi, S. (2005). Osmanlı Kültürü ve Gündelik Yaşam. (E. Kılıç, Trans.). İstanbul: Tarih Vakfı.

Fortna, B. C. (Ed.). (2016). Childhood in the late Ottoman Empire and after. Brill.

French, A. (Ed.). (2020). Early modern childhood: An introduction. Routledge, Taylor & Francis Group.

Heynen, H., & Baydar, G. (2005). Negotiating domesticity: spatial productions of gender in modern architecture. Routledge.

Kent, S. (1993). Domestic Architecture and the Use of Space: An Interdisciplinary Cross-Cultural Study. Cambridge University Press.

Küçük mekteplinin mesai odası nasıl olmalı?. (1932, November 1). Milliyet. p.5.

Lukacs, J. (1970). The bourgeois interior: Why the most maligned characteristic of the Modern Age may yet be seen as its most precious asset. The American Scholar, 616-630.

Miller Lane, B. (2007). Housing and Dwelling: Perspectives on Modern Domestic Architecture (1. bs). Routledge. https://doi.org/10.4324/9780203799673

OKAY, C. (2008). Modern Developments in Children's Education And Creation of a New National Identity for Children in the Late Ottoman Empire. International Journal of Turcologia, 3(6).

OKAY, C. (2009). Modern Developments in Children's Health Care in the Ottoman Empire 1850-1900. International Journal of Turcologia, 4(8).

Öncel, A. D. (t.y.). Apartman: Galata'da Yeni Bir Konut Tipi. Retrieved from https://books.openedition.org/ifeagd/1584

Park Apartımanı Nişantaşı. (1931). Arkitekt, (1931-7), p. 220-223.

Postman, N. (1995). Çocukluğun yokoluşu. İmge Kitabevi.

Rybczynski, W. (1987). Home: A Short History of An Idea. Viking Penguin, Inc.

Sağlam, M., & Neriman, A. R. A. L. (2016). Tarihsel süreç içerisinde çocuk ve çocukluk kavramları. Çocuk ve Medeniyet, 1(2), 43-56.

Somerville, P. (1997). The Social Construction Of Home. Journal of Architectural and Planning Research, 14(3), 226-245.

Tan, M. (t.y.). Çağlar Boyunca Çocukluk. Ankara University Journal of Faculty of Educational Sciences (JFES), 22(1), 71-88. https://doi.org/10.1501/Egifak_0000000859

Toprak, Zafer. (1993). II. Meşrutiyet Dönemi'nde Devlet, Aile ve Feminizm. Sosyo/Kültürel Değişme Sürecinde Türk Ailesi, 1, 216-227.

FURTHER MEANINGS ON AMERICANIZATION IN TURKEY: NARRATED ARCHITECTURES, RE-BUILT DOMESTICITIES

Seçil ÖZCAN GEYLANİ[1]

1Başkent Universty, Turkey
ozcansecil@gmail.com - secil@baskent.edu.tr

ABSTRACT

This paper attempts to make a mutual reading of architecture and literature by focusing on novels produced in 1950s Turkey to elaborate on modernity and the influence of American culture in the domestic sphere. It takes the novels as a source to make a literary and spatial analysis of domesticity, and everyday life in reference to such themes as home, gender, domestic technology and material. Although the modern architectural historiography produced a considerable amount of content on the housing production of the period, most of these studies have been less-represented in terms of demonstrating everyday life practices, domesticity, and active and passive role of the women in the domestic sphere. In a wider perspective, this research also utilizes “literature”, as a potential medium, to understand the social and spatial dynamics of the period in question.

The period is specified according to the social, political and urban developments that played a transformative role in the cultural history of domestic sphere in Turkey. While Cold War and the Kitchen Debates have been continued on the other side of the Atlantic simultaneously, this paper aims to investigate this issue by focusing on the examples of 1950s Turkish literature and try to shed light on the unspoken points of the history of modern architecture in Turkey in this period. In wider perspective, it is going to question the “literature”, and its' potential as a medium, to understand and write a specific time in the history of architecture. Within this framework, this paper aims to expand the meanings of Americanization in the post-war period in Turkey and reveal the “other” American reflections throughout the literature and the architecture of the period.

Key Words: Domesticity; Housing and Everyday Life; Americanization in Turkey, Mid-Century Modernism in Turkey; 20th Century Turkish Literature.

INTRODUCTION

Starting from the Republican Era, the evolution of architectural practice in Turkey has been explored in five periods by İlhan Tekeli as follows: The first period, 1923-1927, corresponded to the continuing influence of the First National Architectural Movement which prevailed during the Second Ottoman Constitutional Period. The second was the Ankara-Vienna cubism of functional architecture between the years 1929-1939. The Second National Architectural Movement comprised the third period between 1940-1950. The fourth, between the years 1950-1960 was marked by International Style solutions. The architecture of the post-war period, respectively, was dominated by the International Style, which carried the mark of United States of America. The buildings as Hilton Istanbul Bosphorus (1952) by Skidmore, Owings and Merrill (SOM) and Sedad Hakkı Eldem, Istanbul Metropolitan Municipality City Hall (1953) by Nevzat Erol, and Emek Business Center (1959) by Enver Tokay and İlhan Tayman were built between 1952-1959, and all were the well-known examples of International Style in Turkey. The fifth period after 1960 was characterized by social consciousness in architecture according to this placement. [1]

As this paper focuses on, following the end of the Second World War, Turkey experienced important changes in socio-political and economic terms that had both domestic and international roots. The most apparent in these terms was the closer relationships with the Western world that affected not only the socio-political system and economy, but also the lifestyles in the country. The influence of the United States on the developments in Turkey after the war resulted in the interpretation of the meaning of the West and the process of westernization of the country. Turkish society, under the influence of political agendas, began to see USA as a symbol of “modernization” which also marked the beginning of an era that can be defined as Americanization in the 1950s Turkey.

In that period Turkey was seeing the USA as a symbol of “modernization”, which was related to various factors and in formal terms the architecture of the post-war period was dominated by the so-called International Style, carrying the mark of the USA. Under the influence of “Americanization”, Turkey become supportive of the private sector and underwent into a process of liberalization, which inescapably changed the life-style as well as the production of the built environment of the country.

In about the same period, migration from rural to urban areas became a rapidly increasing urban and social phenomenon that posed critical problem on housing stock and conditions in Turkey. A parallel development was the increasing focus on developing models and projects for ideal home typologies in architecture. The concept of “ideal home” and what it promised and covered (published in the popular Turkish magazines during the period beginning from the end of the Second World War until the mid-1950s) became a model of domestic sphere, especially by the upper income groups. The same concept, symbolized a medium to “modernize” life-style for the middle income-group. Thus, during the period starting from the Second World War until the end of the 1950s, both the dynamics and habits of daily life and the design of domestic sphere had simultaneously changed.

The apartment house and the apartment flat had emerged as the prototype domestic unit of the middle-class.

The emergence of the apartment house as the prototype housing of the middle-class in Turkey, redefined, at the same time, the positions of women in the domestic environment, a development followed in both literature and architecture. The domestic reform in the houses of the post-war period actually started in the early twentieth century and was related to the new approach towards domesticity and house in America as well. “Home” accordingly, cannot be discussed without understanding the role and identity of women in domestic context. The changing attitudes in aesthetic, moral and social judgments were closely interrelated and thus they influenced the physical appearance and interior of the house and the nature of private life. In the Turkish literature, contemporaneously, women started to write intensively, and began to depict female characters more, and position the “new woman” of the modern Turkey. Especially, in the literature of the post-war period of Turkey, women were generally depicted in domestic space, the house, and together with the idea of modernism, women's participation in social life and education were considered important.

Within this framework, this paper first investigates the major political, and economic developments in postwar Turkey, and analyses the impacts of them on architecture and the literature of the period. Then, it focuses on the Americanization and its’ influence on domesticity, daily life and everyday practices by using the literature of the period to reveal the “other” meanings of this concept.

Major Ideological Shifts in Postwar Turkey and Their Impacts on Architecture and the Literature of the Period

After Democratic Party came to power in 1950, the adoption of the liberal economic policies created a dynamic market place. By the consequent development of the industrialized society, mass-produced tastes became definite forces, resulting in the increasing dominance of consumer values in the society. Thus, starting from post-war period, Turkey was in a period of major transformations resulted from the change in the policy of the state control of the early republican period to the importance given to private sector.

Although Turkey was not one of the active participants of the war, it was affected and the housing construction declined appreciably after 1939. While housing shortage continues, as the result of the migrations from rural to urban areas and big cities as Ankara, İstanbul, and İzmir, demand for housing much exceeded the supply. At the end, the rise in rents and real estate prices led to the formation of fringe settlements, the so-called *gecekondu*s. The number of *gecekondu* units, estimated at 25,000 in 1948, reached 80,000 in 1953 and 240,000 in 1960. [2]

Under the rule of Democrat Party, Turkey experienced major changes politically and in the lifestyles of the country since the modernization was accepted as a result of Americanization. There were a number of factors that initiated such a change. First, Turkey became a member of the United Nations in 1945, then Minister Adnan Menderes won the 1950 elections and thus concluded the one-party rule of Republican People's Party (CHP) which was in administration since 1923. [3] This first multiparty elections brought the pro-American and populist Democrat Party to power. At that time the political influence of Soviet Union was strongly felt in Europe, and USA considered the communist regime of the Soviet Union a major threat. USA considered Turkey a country vulnerable to the threat of communist tendencies, and thus included it in the Marshall Plan of 1947. The Marshall Plan was a plan of the United States for rebuilding the allied countries of Europe after Second World War. One of the main reasons was to get the communism thread under control.

Celâl Bayar ile Adnan Menderes aynı sandıkta oy kullandılar, 2 Mayıs 1954.

Pazar 13 Temmuz 1947

Amerikan yardımı anlaşması imzalandı

Bizim dün imzaladığımız anlaşma, Yunanlıların imzaladıklarından bariz şekilde farklı bulunuyor

İmza töreni Dış İşleri Bakanlığında saat 12 de yapıldı, Dış İşleri Bakanımız ve Amerikan Büyük Elçisi sayanı dikkat birer nutuk söylediler

Amerikan deniz

Figure 1 & 2. Photograph showing Celâl Bayar and Adnan Menderes were voting in 1954 elections & A press clipping announcing the Marshall Plan with Turkey.

DEMİR PERDE ARKASINA BAKIŞ

Bu hafta Amerika'nın Sesi, size şu programları sunacaktır:

AMERİKANIN SESİ

Saat 7.15 — 7.30 | 81, 41, 49 m. ve 379 m, Orta D.

Saat 19.00 — 19.30 | 14, 16, 19, 25, 31, 49 m.

Saat 20.00 — 20.30 | 379 m, Orta Dalga

Saat 21.00 — 22.15 | 14, 16, 17, 19, 25, 41 metre

«RADYO HAFTASI» Ekleri No. 11

AMERİKANIN SESİ

KARADENİZ KAZAKLARI ŞARKI SÖYLÜYOR

AMERİKANIN SESİ'Nİ HERKES DİNLER

Figure 3. A press clipping announcing the weekly program, Voice of America *(Amerika'nın Sesi)* in Turkey.

Although, Turkey was not an active member of the war, it was seen as one of the countries that under the communism threat mostly because of its's geopolitical position. Between the years 1950-1953, Turkey sent troops to Korea and became an ally in the Korean War, that paved way for the membership of NATO in 1952. For the political leaders the admission to NATO made Turkey, "a part of the West". An American base was established in Ankara and American officers, military personnel and their families had moved to Ankara with their families, that initiated the encounter between the Turkish society and the American lifestyle. As Tekeli summarizes, prior to World War II, "West" for Turkey was essentially Europe. After the War, the United States emerged as the leader of the West. Accordingly, the Democrat Party leaders aimed to make Turkey a small America. American influence was felt in the economic sphere through the effects of international market mechanisms. [4]

On the other side, as parallel to Turkey's politically close position with the Western bloc and USA in the renewed world order especially after the Second World War, this period ended up with the embracement of the architectural language of the Western world. Thus, new materials, construction techniques were adopted in Turkish architecture, and products related with rationalism were given. In that period, several private enterprises partnerships among architects and architectural firms were established, and the Chamber of Architects (1954) was founded. The national and international competitions that were supported by 1940s governments, gained momentum in 1950s. The first private architecture competitions were organized towards the end of the 1960s.

Figure 4 & 5. *Anadolu Kulübü*, Turgut Cansever, Abdurrahman Hancı, 1953-57 & *Balıkesir Kervansaray Oteli,* Muhteşem Giray, Affan Kırımlı, 1955-56

As it was discussed extensively in the historiography of modern architecture in Turkey, starting from the post-war period to the 1960s, architectural structures that became the icons of post-war architecture in the USA turned into examples that constitute the mainstream in the representation of modernism in this period in developing countries such as Turkey. Similarly, one of the greatest improvements brought to this period by the influence of the International Style was the presence of residential architecture with reinforced concrete structures and large glass-faced facades, and the

existence of apartment blocks. In particular, the apartment buildings with their qualified interior solutions can be read as the harbingers of changing daily life habits in that period of Turkey.

As for the literature of the period, the novel in Turkish literature did not emerge as an impact of the historical, social, and economic effects of the transition period from feudalism to capitalism as it was accrued in the West. [5] On the contrary to this, it was started with the translation and imitation activities since the authors at the end of nineteenth century assumed that Western civilization was not only advanced in industry and technology but also in literature and education. Their main aim was to become a civilized society with the effects of new understandings, concepts and social values that would borrow from the West. Similarly, as it is discussed by some other literary critics, the weakness of the first novels were determined as the lack of form and the essential values such as; the use of language, plot, narration, and characters. [6] As Berna Moran suggests, although the novel was not improved as the result of the social conditions of the period and it was 'imported', to understand its' exact form and function, one should analyze traditional Turkish tale *(hikâye),* and historical and social circumstances in Turkey. According to Moran, the authors of the period assumed that the transition from traditional tale to novel in Turkey also signifies that transition to rationality, maturity, and in short to civilization. From this point of the view, Westernization movement determines the problematic of the Turkish novel until 1950s in terms of founding its' function, and styles.

Similarly, as Güzin Dino analyses in her *Türk Romanının Doğuşu* (1978), there was not any similarities between the birth of the Turkish novel with the evolution of the Western novel which formed in various historical processes. [7] The Turkish novel emerges with the new tendency, which historically would change all the institutions of the country. The disintegration of the Ottoman Empire and the awareness of the Western civilization constituted the cultural development that would emerge and start a new era in the history of literature in Turkey. According to her, while the reflection of the Turkish society in novel genre can be traced in the beginning of the twentieth century, to reach the contemporary world literature and its' novel, it should be analyzed after the Republican period and almost 1930s.

Since the writers such as Halide Edip Adıvar, Yakup Kadri Karaosmanoğlu, Reşat Nuri Güntekin, Aka Gündüz, Peyami Safa, Hüseyin Rahmi Gürpınar were known with their support to the War of Independence, they continued their novels after the Republican period as well. Thus, this period has been categorized according to the different themes which the writers chose in their novels by literary critics. Although it is possible catching up the similar classifications, there is still some conspicuous variations in those categories.

As it is examined by İnci Enginün, between 1946-1980 new themes came forward both in tale and in novels. [8] The first theme was the commemoration of the past, since Abdülhak Şinasi Hisar used this theme in his many novels and memoirs such as *Boğaziçi Mehtapları* (1942), *Boğaziçi Yalıları* (1953), *Geçmiş Zaman Köşkleri* (1956). The second theme

was the impacts and the impressions of the Second World War and it was under debated both with its' impacts on youth and its' reflections in other countries; respectively *İçimizdeki Şeytan* (1940) and *Korkunç Yıllar* (1956). The democratization process in Turkey and establishment of new parties came forward as another theme, while revolutionary coups and military interventions became more visible in the novels especially after 1970s. As the fourth theme, the "rural", generally as a neglected and forgotten land, started to be remembered with some other issues such as migration from Anatolia to the big cities, especially to İstanbul. Since this theme led novels to expand their subjects to the squatter houses and urban sprawl it lastly ended up with the novels related with the workers, their rights and problems. According to Enginün, new perspectives emerging in historical novels can be counted as the fifth theme. Moreover, women issues, their presence both in domestic and work life was discussed, especially with the acceleration in the number of women writers in that period. As she defines, the presence of the civil officers in Anatolia provided a new perspective to the literate and intellectual groups. Additionally, especially after 1960s, there were novels about the experiences of Turks in Germany which firstly put emphasis on the broken families. The migration and living far away from the homeland started to be a recent theme in the novels while it raised especially after 1970s. And lastly, the novels that inculcate the religious life were written in that period.

In addition to this, in his two-volume literary reference book *Siyasal ve Sosyal Değişimler Açısından Cumhuriyet Dönemi Çağdaş Türk Romanı 1946-2017* (2017), Alemdar Yalçın mentions that classifying the novels according to their themes provided to understand how the novel writing has shaped in time. [9]. According to his classification, starting from the beginning of the 1940s, the novelists tried to deal with the "village novels" (köy romanı) from a different angle, and especially by criticizing the conventional Anatolian approaches. Their main criticism was about the novels that observe the village and Anatolia as an outsider, as *Çalıkuşu* (1922) and *Yaban* (1932). Yet, at that time, the village institutions and the writers who educated in those institutions started to contribute to Turkish literature. While their language was taking its' strength from the realism, and the ideology of the period, this literature became very common in Turkey until 1960s.

"Americanization", Domesticity, and Everyday Life in Literary Architecture of 1950s

At the end of the first decade of the Kemalist regime, by 1931, the Ottoman revivalism and nationalistic approaches was rapidly abandoned in favor of an imported "New Architecture" *(Yeni Mimari),* as the modern architecture of the period called in Turkey at that time. Throughout the 1930s, this new architectural discourse was constructed and legitimated, mainly based on ideologically charged binary way of thinking such as contrasts between old and the new, the traditional and the contemporary, the reactionary and the progressive. [10]

After the foundations of the new state was laid, this period was started to be reflected in the literary works, as well. According to İnci Enginün, the writers focused on the subjects as follows; Anatolia and the Anatolian people, on the contrary to the past and Istanbul -glorification of Ankara and the life in Ankara, struggle and the liberation of the country, revelation with the past and then voicing the beauty of the memories after 1930s, relationship between employee and the employer, moral collapse of ordinary people in romances, and the ordinary people's stories. In that period, the ordinary people and their stories were out in front rather than the social issues. In his novel *Ayaşlı ile Kiracıları* (1934), Memduh Şevket Esendal was introducing apartment buildings, with their own accommodation styles in that period, which included rental rooms and was used as an investment tool for the owner:

"(…) We live in a nine-room section of a large newly built apartment building. This unit was hired by a person named İbrahim Efendi from Ayaş, and he rents out rooms to those who wants. The rooms are lined up on either side of a dim corridor. At the end of the corridor, there is bathroom and the kitchen. My room is the first door on the right." [11]

Additionally, in that period, both women writers and the women characters became much more visible in the literary circles and the novels, as a result of the improvements in rights and the education of the women in the Republican society. As one of those writers Suat Derviş [12] portrays in her narrative *Hiç* (1939), although Seza was depicted as a single-mother, she was searching for herself as an indiviual, and experiencing the public life as a woman:

"(…) The station was very crowded. He was watching this crowd with a great excitement of people who were traveling for the first time in his life." [13]

Women's position in domestic life continued to be visible in novels increasingly, as they portrayed as "the managers of the domestic life" [14] and also the routines in the apartment living. The Americanized lifestyle, which was supported in the period as a result of the relations developed in the political and economic context, began to be visible in the kitchen plans of the apartments produced in the period especially for the high and middle-income group families. While refrigerators were not included in the kitchen drawings of the apartments produced in the first half of the twentieth century, when the *Arçelik* brand, which started to produce the first domestic refrigerator in 1960, refrigerators began to take place in the drawings.

Beside this, both popular media and architectural media organs frequently published post-war American kitchen advertisements, which were not only limited to refrigerators, but also equipped with electrical appliances and functional solutions and are mostly promoted with a female figure. With such an effort, it can be understood that seen that the domestic life in these houses do not fall behind their contemporaries in different geographies, but on the contrary, they closely follow that knowledge.

Figure 6 & 7. Image showing the advertisement of white goods; gas ranges, dishwashers, washing machines in Architectural Digest, 1950 & Image showing imported American refrigerators, washing machines, sewing machines in Arkitekt, 1952.

The authors, on the other hand, observed this new domestic life and everyday routines and reflected them in their novels in Kemal Bilbaşar's *Ay Tutulduğu Gece* (1960) and Orhan Kemal's *Gurbet Kuşları* (1961) as follows:

"These gases are collected in the dome of the barrel. A pipe with a tap is also connected there. The gas comes right into the kitchen this way, it burns like gas. No smell, no smoke." [15]

"Hot steaming dishwater under the kitchen tile faucet. The food is cooked in the pressure cooker and eaten in large and small plates. It washes quickly." [16]

With the effect of its rapid spread, apartment life is problematized by the monotonous and repetitive lifestyle it brings by Oktay Akbal in his *Suçumuz İnsan Olmak (*1957):

"Leaving from the office at five, returning home at half past five, dinner at half past seven, the usual unpleasant hours until half past nine."

"Nuri forgot the clocks. He forgot himself and the whole world. It was like he was alone on earth. He had no home to go to, no woman waiting for him, and two children. A home with its lost peace, distress and lack of love... " [17]

It is noteworthy that in the novels, apartment living generally portrayed for middle- or high-income groups while the low-income groups either depicted as maids or doorkeepers. Although such a distinction was often described as the second group's desire about equipped domestic life, it was also expressed in the opposite way as well. In his same work, *Gurbet Kuşları*

(1961), Orhan Kemal spoke out the discomfort of apartment living from the eyes of maid Ayşe within the words:

"Even if she had a million and bought mansions, she still would not want a refrigerator or a washing machine. God gave man hands, arms and inexhaustible strength. After not washing the laundry by hand, laying the table cloth on the floor and not being able to fill your stomach as you are used to learn from mother and father, you can't be bothered to eat!"

Aziz Nesin, on the other hand, depicts a woman character Sevim, in his novel *Gol Kralı* (1957), and explains the meaning of living in an apartment a young, unmarried lady in İstanbul:

"In this way, she will be a freer woman who can live as she wants, and she will be escaped from the pressure of parents!" [18]

Figure 8-9. Images showing the advertisements of new materials for interiors as “rubber” and “vinyl” in Architectural Record, 1957.

Literary works of the period also played an intermediary role in the infiltration of some newly introduced materials and imported products into daily life. The materials as nylon, mica, rubber started to bi visible in domestic life depictions as follows:

"It's the kitchen of any apartment. Plates, pots, gas stove, dirty dishes. The only feature that sets this kitchen apart from the others is the lush nylon apron hanging from the nail on the wall." [19]

CONCLUSION

In the process shaped by the 1930s, apartments and apartment life were considered as a tool of modernization and westernization. The migration from rural to urban areas, which emerged as a result of the economic dynamics of the post-war period and the policies, has been one of the reasons for the visibility and the encounter of different social classes in big cities.

The apartment life in postwar Turkey, also provided to transform daily life practices and re-shaped the domestic life. As a response to the promises of the post-war world, domestic life turned into a stage where the technological power of the period was tried to be shown.

While the political, and economic developments in postwar Turkey left mark on the architecture and literature of the period, Americanization became even more visible both in social and domestic life. Thus, the literature of the period started to reflect and explain; how the apartment living was transformed both with the presence of electrical devices and new materials, how the new actors as maids or doorkeepers were defined in this practice, and how the position of the women and the social class were re-defined in that domestic life.

REFERENCES

[1] Tekeli, İ. (1984). The Social Context of the Development of Architecture in Turkey" in Modern Turkish Architecture, Philadelphia: University of Pennsylvania Press.

[2] Sey, Y. (1984). "To House the New Citizens: Housing Policies and Mass Housing" in Modern Turkish Architecture, Philadelphia: University of Pennsylvania Press.

[3] Gürel, M. Ö. (2016). "Introduction" in Mid-Century Modernism in Turkey: Architecture Across Cultures in the 1950s and 1960s. New York and London: Routledge.

[4] Tekeli, İ. (1984) The Social Context of the Development of Architecture in Turkey" in Modern Turkish Architecture, Philadelphia: University of Pennsylvania Press.

[5] Moran, B. (2019). "Türk Romanı ve Batılılaşma Sorunsalı" in Türk romanına eleştirel bir bakış 1: Ahmet Mithat'tan A. H. Tanpınar'a (1983). İstanbul: İletişim Yayınları.

[6] Kurdakul, Ş. (2002) Çağdaş Türk Edebiyatı I: Meşrutiyet Dönemi (1986) İstanbul: Evrensel Yayın.

[7] Dino, G. (2008). "Giriş" in Türk Romanının Doğuşu (1978). İstanbul: Agora Kitaplığı.

[8] Enginün, İ. (2010). Cumhutiyet Dönemi Türk Edebiyatı, İstanbul: Dergâh Yayınları.

[9] Yalçın, A. Siyasal ve Sosyal Değişimler Açısından Cumhuriyet Dönemi Çağdaş Türk Romanı 1946-2017, Ankara: Kültür Bakanlığı Yayıncılık.

[10] Bozdoğan. S. (2001). “First Moderns” in Modernism and Nation Building: Turkish Architectural Culture in the Early Republic, Seattle&London: University of Washington Press.

[11] Esendal, M. Ş. (1934). Ayaşlı ile Kiracıları. Ankara: Bilgi Yayınevi.

[12] Uzun, M.S. (2011). “Romancı Yönüyle Suat Derviş,” Master’s Thesis, Hacettepe University.

[13] Derviş, S. (1923). Hiç. İstanbul: İthaki Yayınları.

[14] Gürel, M. (2011). "The Modern Home, Western Fashion and Feminine Identities in Mid-Twentieth Century Turkey," in Performance, Fashion and the Modern Interior: from the Victorians to Today, F.Fisher, T.Keeble, P.Lara-Betancourt, B.Martin (eds.), Oxford, Berg.

[15] Bilbaşar, K. (1960). Ay Tutulduğu Gece. İstanbul: Tekin Yayınevi.

[16] Kemal, O. (1961). Gurbet Kuşları. İstanbul: Everest Yayınları.

[17] Akbal, O. (1957). Suçumuz İnsan Olmak, İstanbul: Cumhuriyet Kitapları.

[18] Nesin, A. (1957). Gol Kralı. İstanbul: Nesin Yayınevi.

[19] Akbal, O. (1957). Suçumuz İnsan Olmak, İstanbul: Cumhuriyet Kitapları.

AN AUTOPSY OF TRUTH IN DESIGN PROCESS: HOW DESIGNERS THINK IN POST-TRUTH ERA

Serkan Can HATIPOĞLU[1], Ruşen YAMAÇLI[2]

[1] *Eskişehir Technical University, Turkey*
serkanch@eskisehir.edu.tr
[2] *Eskişehir Technical University, Turkey*
ryamacli@eskisehir.edu.tr

ABSTRACT

Post-truth has an impression that the facts have been only corrupted with it. Many examples support this impression. However, it should not be perceived as just a disruption of the truth considering only political events. In different fields, such as creative industries, it may have different implications. Despite studies regarding education, there has not been much discussion on the design process and education. The objective of this research is to develop an introductory examination of what the design process (with statements in the book 'How Designers Think') can produce in post-truth cases and to seek the productive potentials of post-truth. Therefore, the claims were reviewed - as design problems, solutions and process itself - within the framework of the post-truth era. Some of the results are as follows: For design problems, designers need to find a way to oscillate among objectives without based on truth. Post-truth environments may trigger finding out unique spatial possibilities with designs of unique hierarchies. For design solutions, in post-truth era, the only optimal thing is to be apathetic about truth. There is no need to seek the optimal solutions. The ideal of wholeness is expired for the solutions. This situation fosters free circulations of tiny parts of solutions in the post-truth universe. For the design process, the correctness of the process is much more questionable anymore. Identifying problem is a crucial part of the design process. As the truth disappears, it becomes more difficult to discriminate the characteristics and value of the problems.

Key Words: Post-truth; Design Process; Design Education; Architecture; Productive Force.

INTRODUCTION

Post-truth has been shown its presence in the literature in the early 2000s (Keyes, 2004). However, it was acquired popularity through the increase of 2000% in the use of the term in the Oxford Dictionary in 2016 - compared to the previous year (McIntyre, 2018) and selected as the word of the year in 2016. According to the definition in the dictionary, post-truth is "relating to circumstances in which people respond more to feelings and beliefs than to facts" (url-1). The fact that it was frequently mentioned in the discussions about the 2016 US presidential elections and the UK Brexit referendum has brought about the re-emergence of the concept. In the first draft following these discussions, post-truth has an impression that facts have been damaged and that populist discourses have overcome the truth. Such examples can be found especially in various political and economic fields related to the irrational decision-making tendency of people. Post-truth, however, should not be perceived as just disruption of the truth and should not be considered only through the political events that are the source of popularization of it.

In current examples, speculations created through conspiracy theories stand out. A conspiracy theorist, for instance, has blamed 5G (as a feature of new generation mobile phone technology) for the rapid spread of coronavirus (url-2). It has aroused some echoes on social media. Such one and many similar conspiracy theories are produced and circulated on social media regarding the emergence and infection of coronavirus. However, what makes this example particularly critical one is that this theory is accepted as truth and has a practical reaction. In some cities of England, such as Birmingham and Merseyside, someone attempted to set on fire to cell towers as a response to this claim (url-3). Out of this baseless fear, protests were also held in various regions (see, Figure 1).

Figure 1. The protest of those who accept the theory that the coronavirus spreads with 5G technology (url-2 & url-3)

Considering them, the claims and the reactive actions of the claims seem to have weak foundations. For this reason, pseudo-truths ignite much faster and fade out in a short time, parallel to their rashness of circulation. The desire to consume and finish up the input, coming from social media, as soon as possible may also be the partial reason for it. Examples with such impulsive action and weak content are more common for the media, even if there are stronger examples that are established more systematically. Additionally, they are consumed as an element of entertainment. However, it should be noted that coming up conclusion quickly regarding post-truth

through examining such examples with their weak foundations would be weak reasoning for the intellectual world.

KNOWLEDGE AND TRUTH IN POSTMODERNISM

Thoughts on the truth have taken different forms in different eras. Here, at the beginning of the paper, it is useful to have a quick historical summary. In ancient philosophy, the sophists claimed that there is not a single truth but multiple truths. Socrates, on the other hand, argued that there is a universal truth that applies to everything (Cevizci, 2015). In the following of Socrates, there has been a presupposition of an absolute truth parallel with the arguments regarding God. The dominant re-appearance of the truth arguments has been accelerated by the postmodern period. In this period, there was somehow a turning back to the thought of the sophists. Postmodern discourse mostly denies the existence of universal truth. There may be different truths parallel to the position of the individual. While this proposition has caused ontological chaos, it has replaced grand narratives with little narratives so which allowed the proliferation of little narratives. With the implications for the postmodern situation, Lyotard (1984) develops criticisms over the concept of absolute truth. Grand narratives will be replaced by little narratives led by feelings and experience. In the postmodern period, Baudrillard is one of the thinkers that stands out with his remarks on truth. Reality has been destroyed, thus defending the truth has been disabled so that reality has been replaced by hyperreality. Nevertheless, the method of this is not an imitation. While the imitated one can be easily recognized by comparing the original one, there is no such practice in simulation. Because there are no longer two distinctive phenomena as real and fake (Baudrillard, 1994). Disneyland is the most popular example of it. Indeed, it is a simulative tool that legitimizes the reality of the rest of America. In other words, the simulation that serves to reproduce the reality of America is Disneyland (Baudrillard, 1994). Thus, hyperreality has the competence to produce itself without a reality.

Same Structure? Comparison of Post-truth and Postmodernism

The question that arises here is whether post-truth is the practical reflection of postmodern discourses today or not. The Internet has provided the appropriate conditions for the loss of the idea of truth and the prevalence of post-truth. The responsibility has disappeared with anonymous identities and it has provided a ground for the truth to be ignored. Thus, reality has left its place in a simulation (Keyes, 2004). With this aspect, post-truth becomes similar to Baudrillard's discourse. There is also another similarity with his discourse: The denial of information that creates public opinion before, but which is not correct, imposes a truth that is perceived as an unquestionable one. In other words, the new information, after the denied one, is often justified as reality without the need for ongoing verification. Just as Disneyland provides a perception of the rest of America as reality (Baudrillard, 1994), the information that is found out to be post-truth and has

no basis for truth causes a tendency to perceive the other information as reality without any doubt. Further, the multiplicity of little narratives in postmodern discourse seems to coincide with post-truth practices. However, it would not be correct to claim that post-truth completely overlaps with postmodern discourses. Along with little narratives, we have mentioned criticisms of absolute truth. In postmodern theory, there is the existence of different truths shaped by the position of the individual. This indicates that postmodern theories still pay attention to the truth. However, truth has completely lost its significance in post-truth. This aspect makes them different approaches. To sum up, even if there are some similarities with previous theories such as postmodernism, we are in a novel circumstance and there is a need to review it focusing on different fields.

POTENTIALS OF POST-TRUTH

Let's consider post-truth by observing how people grasp it and its other potential conception. When the post-truth is understood only with the 2016 US elections and the UK Brexit referendum that made it popular, it is perceived as if it has just a problematic and corruptive structure. The major literature offers suggestions for the prevention and suppression of post-truth. There is, however, another way: starting with the acceptance of living in the post-truth era and examining the relations that are built up in this era. It allows us to frame the reflections of post-truth in a different comprehension.

First of all, having the power of denial reveals a tendency to claim that he/she knows the truth clearly at any rate and to become prudent about what the truth is (unquestioning acceptance may follow it). This situation may cause another bias while trying to ensure impartiality. But the more hazardous side is the power to dominate the easily acquired (by denial opposite one) truth. In such a case, the critic of post-truth is not aware that he/she has brought himself/herself to the position she criticizes by having power. In other words, the ability to decide what is not truth can quickly generate a belief that one is competent about what is truth as well. While this situation 'quickly' leads to the judgment of acquired truth, it also undermines the practice of critical thinking about the "truth". In the age that truth has lost its importance, it would be better to react appropriately to the dynamics of this age and to adopt an attitude that does not condemn post-truth immediately.

The trust problem and the emphasis on impartial information caused some components of the information to be ignored. Keyes (2004) mentions that dramatic elements are preferred more than factual ones in television. It is acceptable for television to make this choice as a result of its demand to get our attention and keep it alive in-itself. In the examples in the system of media, the dramatic items only turn into a means of attracting attention and manipulation if the person is in a "passive" position. Nevertheless, it does not seem reasonable to focus only on such a condition and remove the dramatic qualifications from the reasoning systems. It is obvious that the media prefers dramatic intensity due to the emphasis on emotions and the

lingering importance of reality (Keyes, 2004). However, the fact that the media has used it instrumentally to develop results contrary to reality does not mean that information about truth cannot be produced from the dramatic intensity. Abusive use by dominant means does not place the phenomenon itself in a malicious attitude. The quick acceptance of "dramatic intensity" here causes individuals to exclude potential knowledge that they can acquire with it and affirm only scientific knowledge that is completely devoid of emotion. A similar issue resulted from the isolation of scientific knowledge is also pointed out by Lyotard (1984) (Since the postmodern designations, the discriminating attitude regarding knowledge seems to be felt more sharply isolated rather than dissolved). Following that, the facts may lose their profound content in their essence. In short, perceiving the dramatic intensity as a criterion that offers a different dimension to the truth, instead of excluding immediately, may offer novel perspectives to make sense of it.

Even if post-truth is considered a manipulative practice, it is not just the manipulation of public opinion within political issues. For instance:

— What are the advantages and disadvantages of this manipulative attitude in productive activities such as design and architecture?

— Are designers able to liberate and encourage themselves through new pseudo-possibilities (as a result of post-truth)?

The change caused by post-truth should be considered as the trivialization of the truth, rather than as a distortion of it, which was understood by the case studies of 2016. Trivialization of truth manifests things that are not based on truth. If one does not seek to produce/reproduce a truth, the projects here may be able to have a productive force. Because it is not simply a manipulative bias towards the truth, but an act of production that ignores the truth and liberates itself from the truth (Koro-Ljungberg, Carlson, & Montana, 2019). Hence, starting to build ideas with the presumption that the search for truth is unnecessary may integrate designers into the post-truth era.

INITIAL TRANSLATIONS OF POST-TRUTH FOR THE DESIGN PROCESS

It is possible to find various studies at the intersection of education and post-truth (e.g., Bowell, 2017; Peters, 2017). However, there has not been much discussion on specifically design education and the design process. Since it is based on “human”, it is not possible to isolate design education from post-truth discussions and to keep going as if there is no post-truth.

Design education is mostly based on producing fictional realities and creating a discussion ground from them. Studies have been carried out to increase the creativity of the design process by generating alternative realities and fictions (e.g., Hatıpoğlu 2020). To date, inquiries about the truth in the design process have been made using various terms: Alternative truths, quasi-truths, deconstruction or reconstruction of truths are some of

them. However, in these studies, similar to the postmodern discourse, there is a concern about how the truth can be understood rather than the loss of truth. In this study, we present the claims of Lawson (2005) - the author of How Designers Think - who analyzes the design process and the structure of the design activities. Then the claims will be reviewed within the framework of the post-truth era. The objective of this research is to develop an introductory examination of what the design process can produce in post-truth cases (with statements of Lawson (2005)) and to seek the productive potentials of post-truth.

Design knowledge identifies itself by its ambiguity. Nature of design activity is grasped uncertain, ambiguous and exploratory by Lawson (2005). The designers need to get the ability to deal with the ambiguous process. It may provide to generate and keep many alternative solutions open for as long as possible. In the recent conditions, however, we need to cut down the connection of truth for solutions.

Lawson (2005) developed a suggestion regarding the design process which identifies it as a negotiation of problem and solution (see, Figure 2). It involves three activities: analysis, synthesis and evaluation.

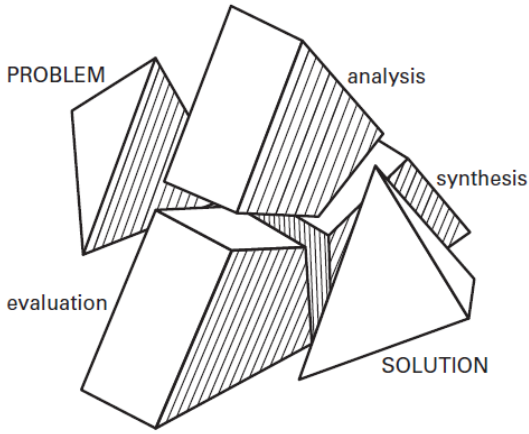


Figure 2. The design process between problem and solution by three activities (Lawson, 2005, p. 49).

A highly critical source (truth) for three of them is lost now. Even if the problem is clear enough, it is difficult to make them one total piece (as in the previous figure) because of non-compatible parts (i. e., analysis, synthesis and evaluation). Although it may seem purely chaotic at first, it would be chaotic when designers have just an ideal regarding truth. If there is the loss of the idea of truth, then harmonic and holistic one piece is not a concern for the designer.

We'll review the examinations of Lawson (2005) as design problems, solutions and process itself.

Regarding design problems:

(1) “Design problems cannot be comprehensively stated” (Lawson, 2005, p. 120). It is difficult to compose a map of the design process. Because design problems are full of ambiguous objectives. They are inclined to change during the process. However, search for truth won’t be one of those objectives. It strengthens the difficulties of mapping the process.

Designers need to find a way to oscillate among objectives without based on truth. It may facilitate to associate several objectives with totally different foundations. Because the similarity of their truth is unnecessary anymore. The statement of the design problem is still incomprehensible, but now, they have not just ambiguous but also groundless objectives.

(2) “Design problems require subjective interpretation” (Lawson, 2005, p. 120). Designers from different fields generate a different solution to the same problem. As aforementioned, the examples of post-truth from different fields demonstrate (sometimes) that people respond much more to feelings and beliefs than to facts. Thus subjective area for discernment of incidents and objects is expanded. However, we need to find a novel verification system, not for the acceptance of truth, but for the problem to be considered valid in design practice.

(3) “Design problems tend to be organized hierarchically” (Lawson, 2005, p. 121). For instance, designing a doorknob may emerge considerations of doors, walls, buildings. From now on, what are the obstacles to think a doorknob in a tough and direct relation with the sky? There will be still a hierarchy (this is a crucial part of design actions). Nevertheless, it is not squeezed into just physical “facts” anymore. People may deny it and say that it is impossible in the sense of some perceived truths. However, designers don’t need to restrict themselves into known spatial relations. It is an opportunity to find out unique spatial possibilities with designs of unique hierarchies. Post-truth environment will allow it.

Regarding design solution:

(1) “There are an inexhaustible number of different solutions” (Lawson, 2005, p. 121). The reason is that design problems cannot be comprehensively stated. Owing to its similarity, we have similar implications as the first feature of the design problem.

(2) “There are no optimal solutions to design problems” (Lawson, 2005, p. 121). However, there are acceptable solutions. There is not a perfect solution so that designers should not escape from recognizing the wrong parts of each alternative. Without an optimal solution, there is still a motivation to search for truth. Hence, this statement points out the existence of a repository containing various truths (via solutions). In post-truth era, the only optimal thing is to be apathetic about truth. As long as the truth is no longer a significant part of the solution, any solution can be tested out and there is no need to seek the optimal one. Because the designers don't hope to discover the universal truth with such an optimal solution.

(3) “Design solutions are often holistic responses” (Lawson, 2005, p. 122). Now, the ideal of wholeness is expired for the solutions. Because there is

no need for it. This situation fosters free circulations of tiny parts of solutions in the post-truth universe. Still, possible integrations could come out, for this time, with anonymous identities and deliberate ignorance of the truth. Mostly, they may be partial integrations without any claim of wholeness. Further, it is still difficult to dissect these integrations.

(4) “Design solutions are a contribution to knowledge” (Lawson, 2005, p. 122). If designers appreciate the knowledge beyond just scientific ones… The contributions don’t have to intensify the foundation of the knowledge. Because a weak foundation is not a big deal or a problem to be solved from post-truth perspective. Yet there is a need to investigate the characteristics of such contributions.

(5) “Design solutions are parts of other design problems” (Lawson, 2005, p. 122). When the designers apply their solutions to the problem, new problems may appear. From now on, the capacity of problems’ diversity is expanded considerably. The expansion of it resulted from new associations that relatedness is not a criterion based on truth.

Regarding the design process:

(1) “The process is endless” (Lawson, 2005, p. 123). As a consequence of limitless different solutions and no comprehensive formulation of problems, we cannot expect a finite design process. Adding the groundlessness coming from the absence of truth, the infinite ongoing waves of design fits also in post-truth era. The designers may need to improve themselves to swim safely in this ocean. But how? This question needs an in-depth investigation.

(2) “There is no infallibly correct process” (Lawson, 2005, p. 123). Despite attempts for design methods that would provide the best solution, there is no good way of designing which is valid for all design processes. The correctness of the process is much more questionable anymore. Similar to current examples of post-truth, some parts of the design process may flare up much faster and fade out in a short time, parallel to the rashness of their circulation. In spite of quick changes, the designers should find a way to build up a little bit stable structure. Even if they can’t do it, they need to avoid quick decisions as a reaction to quick changes.

(3) “The process involves finding as well as solving problems” (Lawson, 2005, p. 124). Identifying problem is a crucial part of the design process. Problems are becoming easy-to-catch in post-truth era. Nevertheless, it doesn’t indicate that all problems could be crucial to developing design ideas. As the truth disappears, it becomes more difficult to discriminate the characteristics and value of the problems. When we renounce the search for truth, we need to develop more systematic ways to identify problems. Or, there is a need for pre-acceptance that design problems will be lost their value in the understanding of the design process. Then, we need to explore something else, in a similar vein with previous characteristics of design problems, to build up the design process in post-truth era.

(4) “Design inevitably involves subjective value judgement” (Lawson, 2005, p. 124). Success is a subjective parameter for design and depends on

judges. Owing to its similarity, we have similar implications as the second feature of the design problem.

CONCLUSION

Post-truth has been used mostly in political and economic issues. It, however, should not be perceived as just a disruption of the truth and not be considered only through political events. Because to conclude quickly regarding post-truth through examining some examples with their weak foundations would be weak reasoning for the intellectual world. Starting with the acceptance of living in the post-truth era and examining the relations allow us to frame the reflections of post-truth in a different comprehension. The change caused by post-truth should be considered as the trivialization of the truth, rather than simply as a disruption of it. There are studies with education and post-truth. However, it is not discussed much on specifically design education and design process. In this respect, the claims of the book 'How Designers Think' was reviewed. We have had reflections about design problems, solutions and processes. This study is the initial and introductory translation of post-truth discourse for the design process. Thus, different relationships have been revealed between the design process and post-truth. In future studies, unquestionably, each of these reflections should be discussed in detail and investigated with experimental conditions.

REFERENCES

Baudrillard, J. (1994). Simulacra and simulation: University of Michigan press.

Bowell, T. (2017). Response to the editorial 'Education in a post-truth world'. Educational Philosophy and Theory, 49(6), 582-585. doi:10.1080/00131857.2017.1288805

Cevizci, A. (2015). Felsefeye giriş: Nobel Akademik Yayıncılık.

Hatipoğlu, S. C. (2019). Textual examples in idea generation phase of design process: Creativity and fixation. (MSc's dissertation). Istanbul Technical University, Istanbul.

Keyes, R. (2004). The post-truth era: Dishonesty and deception in contemporary life: Macmillan.

Koro-Ljungberg, M., Carlson, D. L., & Montana, A. (2019). Productive Forces of Post-Truth(s)? Qualitative Inquiry, 25(6), 583-590. doi:10.1177/1077800418806595

Lawson, B. (2005). How designers think (4 ed.): Architectural Press.

Lyotard, J.-F. (1984). The Postmodern Condition: A Report on Knowledge. Minneapolis: University of Minnesota Press.

McIntyre, L. (2018). Post-truth: MIT Press.

Peters, M. A. (2017). Education in a post-truth world. Educational Philosophy and Theory, 49(6), 563-566. doi:10.1080/00131857.2016.1264114

url-1 - https://www.oxfordlearnersdictionaries.com/definition/english/post-truth

url-2 - https://www.euronews.com/2020/05/15/what-is-the-truth-behind-the-5g-coronavirus-conspiracy-theory-culture-clash

url-3 - https://www.nytimes.com/2020/04/10/technology/coronavirus-5g-uk.html

OTHER SPACES IN JEAN BAUDRILLARD

Semiha ISMAILOGLU[1], Asu BESGEN[2]

[1]Atatürk University, Turkey
semiha.ismailoglu@atauni.edu.tr / semihaismailoglu@gmail.com
[2]Karadeniz Technical University, Turkey
abesgen@ktu.edu.tr / abesgen@gmail.com

ABSTRACT

In architectural design process, architect carries out the process in line with the purpose of the employer and the user, and the context between the design problem and the design area. The context also gives design a meaning. It does not matter where the space is, which is not in a context with the area. Likewise, as a result of globalization and the increase in consumption, the space, whether is thought to serve a certain purpose or not, becomes as a result of monotype mass production, leads to the emergence of products called “other spaces”. Concordantly, the outcomes of his monotype mass production will be discussed through the spaces which Baudrillard included in his books.

In this way, the main purpose of the study is to discuss the concept of “other spaces” through the eyes of Jean Baudrillard’s two books: “Truth or Radicality? The Future of Architecture” and “Singular Objects of Architecture - Architecture and Philosophy”. In the study, the information of space designs with quotations from books are considered as a whole. In this context, the usage purposes of the sample spaces, location and context, analysis and interpretation of Baudrillard’s criticism within the contents of the books are made. Also, the contribution of the buildings to the subject content and their place in the subject are evaluated. As a result, the formation of “other spaces” in the changing world cycle is demonstrated by content analysis through Baudrillard.

Key Words: Other Space; Jean Baudrillard; Architecture; Design; Theory.

INTRODUCTION

Architecture is directly or indirectly related to many disciplines as it creates an intermediate section and feeds from different disciplines. Architecture, despite being associated with various disciplines have since occurred, began to become more involved in multidisciplinary studies in recent years. Literature emerges as one of the fields in which architecture creates dialectics. The buildings, which are the design products of architecture, also witness the event fiction of the books. Buildings; although take place more intensely in works such as novels, stories, memoirs, compilations, are also included in the written works in different fields as the field of fiction or data to support the fiction.

It is possible to consider the buildings mentioned in different types of printed works in the field of philosophy. In the field of philosophy, the priority is the textual expression, in other words, the use of visuals is not common in the printed works, so reading in philosophy is accomplished by focusing only on the text. However, this situation changes in interdisciplinary studies that form a cross-section with philosophy, and is exactly the opposite in the works related to the field of art and/or architecture, where visuality is at the forefront. In this context, the joint studies in the field of architecture and philosophy is the main issue of this article in scoping on the architectural buildings in the published works of Jean Baudrillard, who is one of the most important philosophers in modern world.

The French philosopher Jean Baudrillard (1929, Reims-2007, Paris) was highly criticized in his time for his general thoughts and his scathing speeches against Foucault; therefore, it was tried to be intimidated by pressures, while it should have been in the spotlight more than many philosophers. After studying German Language and Literature at Sorbonne University, Baudrillard started to teach German at High School, but continued his studies in this direction by not leaving the academy. He visited many countries, especially the USA and Japan, to give lectures and conferences. Baudrillard aroused great repercussions with the new designs and concepts he developed in order to understand the reflections of the latest forms of communication, which are increasingly virtualized electronically and technologically, in human societies with their “real (!) values” (Ulaş, 2002; Eroğlu, 2007; Baudrillard, 2014).

Being one of the most influential philosophers of the last eras, Baudrillard is known for refusing the current political and ideological trends. As a philosopher having been impressed by Marx’s ideas, Baudrillard attempted to revise the Marxist theory at the beginning of his life as a sophisticated and started to criticize seriously the classic Marxist tradition, especially in his works published in 1970s. The formations that took place in the world in 1960s, the practice of capitalism and the failure of Marxism to give what was expected were effective in breaking up his Marxism. It is commonly known as the “Simulation Theory”, in his own words as “radical theory” or “pataphysics”, and his ideas about the phenomenon of consumption that made Baudrillard gain a worldwide fame (Anık, 2016; Kızılçelik, 1996; Dağ, 2014).

Baudrillard has works on production, consumption, reproduction, politics, sexuality, television, fashion, photography, architecture and put his own concepts out, in which he tells his memories of the places he has visited. Although Baudrillard has works with many different contents, it is seen that he makes the use of architectural products in the context of his works' content.

According to Baudrillard, architecture makes a global analysis of the objects. The world of architecture is the precision of objects which is transparent, functional and/or non-functional, and the current architectural problem is to say that architecture cannot be done without the idea of architecture and the history of architecture. If you have an architectural project in mind; you have different data about the place, history, environment, the elements of the project, its goals and objectives; all this may lead to the arrival, at a certain moment of an astonishing object that will be truly different from the original project (Baudrillard & Nouvel, 2002). In this context, Baudrillard states that many parameters such as geography, politics, culture and history in architectural design should be considered as a whole, and a holistic approach should be exhibited. It is expected that the building will be a whole with its location, material, form and style during the time period from the beginning of the design until it is built, even after it is built. This provides context in the design. Therefore, context in architectural design gives a meaning to the product. It is inevitable for an architectural design that does not have a context to be called "other" in its environmental relations. The context of the design with the place gives it a meaning. It doesn't matter where or how the space is, if it is not in a context with the place. Likewise, putting the space, which is thought to serve a certain purpose, to use for independent purposes or placing the same designs, such as mass productions, in the design area causes the emergence of "other space" productions.

METHOD OF THE STUDY

The main purpose of the study is to deal with the concept of "other space" through the buildings mentioned in the written works of Jean Baudrillard. Through this purpose, the boundaries of the study are Baudrillard's written works in the field of architecture, and the buildings in these written works.

The books that make up the sample of the study are: "Truth or Radicality? The Future of Architecture" and "Singular Objects of Architecture-Architecture and Philosophy". Since the original language of both works is French, the studies have been completed through English translations, but English version of the book is obtained from the book "Mass, Identity, Architecture" by Francesco Proto (2003) which is a compilation of Baudrillard's works.

The content analysis, one of the qualitative research methods, is used in the study. The study consists of three steps (Table 1). As a primary step, content analysis was carried out on the books. The buildings included in the Baudrillard's works were determined by content analysis. The general presentation of the buildings was determined as the second step, was made

using texts and visuals. In the last step, the state of being as the "other space" was evaluated through Baudrillard's thoughts over the buildings in his books. As a result, the "otherness of spaces" has been interpreted through the places and contexts of the designs in the light of Baudrillard's thoughts.

Table 1. Steps of the study

Content analysis of the books
↓
Presentation of the buildings
↓
Evaluation of the buildings as "other spaces"

SCOPE OF THE STUDY

The sample of the study consists of the buildings mentioned in the books; "Truth or Radicality? The Future of Architecture" and "Singular Objects of Architecture-Architecture and Philosophy". The main reason for choosing these two books is the idea that the state of being "other" can be seen on a design example with its concrete existence. The information about the buildings in Baudrillard's books is given in Table 2.

Table 2. Buildings in Baudrillard's books:"Truth or Radicality? The Future of Architecture" & "Singular Objects of Architecture-Architecture and Philosophy"

Building	Location	Construction Year(s)	Architect(s)
Versailles Theater	France	1770	Ange-Jacques Gabriel
Villa Savoye	France	1929 – 1931	Le Corbusier
World Trade Center	USA	1966 – 1973	Minoru Yamasaki & Emery Roth & Sons
Pompidou Center	France	1971 – 1977	Renzo Piano & Richard Rogers
Fondation Cartier	France	1984	Jean Nouvel
Biosphere 2	USA	1987 – 1991	Peter Jon Pearce
Belém Cultural Center	Portugal	1989 – 1992	Vittorio Gregotti & Manuel Salgado
Guggenheim Museum	Spain	1991 – 1997	Frank Gehry
Asian Art Museum	France	1998	Kenzo Tange

Versailles Theater, when it opened, was the largest theater in France with 712 seats, and also, Europe's largest concert hall under King Louis XV, was a great example of technical achievement and an impressive feat of decorative refinement. It was occasionally used for opera and drama until it

was converted into a parliament building by Edmond de Joly. In 1748, King Louis XV's first architect, Jacques-Ange, drew inspiration from Benedetto Alfieri's drawings of an inverted cylindrical vault for the Theater Royal in Turin, with an inverted cylindrical vault to "increase resonance" under the orchestra, drawing a three-level box-like elliptical theater; thus the theater included a removable stage and a movable ceiling that could hide the top three floors. King Louis XV sent Gabriel to Italy to develop his project and obtain all the necessary information and technical data, to build an excellent theater at Versailles. In 1763, a new design was made with a "harmonious" interior wood decor and pillars, and sculptures for acoustic diffusion (Url-1; Url-2; Url-3; Url-4).

Figure 1. Versailles Theater, Ange-Jacques Gabriel, France, 1770 (Url-1; Url-5)

According to Baudrillard, the Versailles Theater is entered through a completely neutral, raw, undecorated, stone corridor; the hallway suddenly opens into something magnificent in terms of decor, fine craftsmanship. The period in which this theater was designed, imagined and realized and the decorations that draw attention are in the foreground. Transcending the notions of the past in the present; notions of contrast, articulation or extension should be taken as the basic concepts of the architectural project. In this sense, the use of contrasts in the theater building is an example of the beginning of these notions (Baudrillard & Nouvel, 2002; Proto, 2003).

Villa Savoye, built between 1929 and 1931, is located in a forested area in Poissy, 30 km north-west of Paris city center. The customer, who made a special order for Savoye, requested from Le Corbusier for a medium-sized country house/suburb residence design where they can escape on weekends, from the city life and stress. It is seen that Corbusier lifted the main mass of the structure from the ground by means of pilotis. At the same time, beside the free facade and open floor plan, a ramp is placed leading towards the terrace roof and circling the building. The emphasis on the main mass in the form of a box raised from the ground and the horizontal windows surrounding the building along the façades are not interrupted even though they are open on the balcony part, ensuring that the living room windows give an apparent continuity. The cubic main form, on the other hand, is animated by the cylindrical walls and strengthens the composition provided by the geometric proportions of the building (Url-6; Url-7; Url-8; Url-9).

Figure 2. Villa Savoye, Le Corbusier, France, 1929-1931 (Url-10; Url-11)

Baudrillard stated that Villa Savoye is well-kept, beautiful and mature, and even an example of cultural heritage. Villa Savoye was shaped in line with Corbusier's design principles and Modernism Movement (Baudrillard & Nouvel, 2002; Proto, 2003).

Emery Roth & Sons is the assistant architect in the **World Trade Center** project designed by the famous Japanese architect Minoru Yamasaki. The excavation began in 1966 and the towers were finished in 1970 and 1973. The north and south towers are 110 floors and their heights are 417 and 415 meters, respectively. Yamasaki's World Trade Center, as "the physical expression of world peace", has been defined as the center of communication, information, proximity and comfort for many workplaces and businessmen. Yamasaki proposes demolishing all the buildings in the building blocks and constructing a single mega-block in their place. Thus, Manhattan gets rid of the narrow streets and the vehicle traffic brought by the streets, and the streets covering the project area are widened by three times.

The plan scheme of the towers was designed as a square with softened joints. Besides its architectural simplicity, the building included two other important technological innovations. Each was a response to a particular problem: The elevators and the structural system. It was the developments of elevators in the first place that led to the constructions of skyscrapers. At the center of the building was the core, which contains all the circulation areas, toilets and mechanical shafts of the towers (Url-12; Url-13).

Since Yamasaki has acrophobia, he thinks that the people who will work at World Trade Center may also have acrophobia and tries to reduce the perception of height inside the building by keeping the windows small and narrow. The columns on the façade extend outward by 30 cm and each acts as a solar control element for the windows next to it. As one descends towards the ground, all three columns on the façade combine to make the façade surrounding the lobby more permeable (Url-12; Url-13).

Figure 4. World Trade Center, Minoru Yamasaki, USA, 1966-1973 (Url-14; Url-15)

The built-in objects give Baudrillard a dizzying sense of space. For this reason, he thought that there is no “marvel of architecture” like the World Trade Center. He was interested in singular architectural objects that seem to belong to another world and give the place intoxication. For Baudrillard, the truth of the World Trade Center building is that it is unlike anything, and the unity of twin masses eliminates the “original”. This situation is an indicator of the profile of the society. Although this design with two towers, which are replicas of each other, was not designed on a computer, it is a preview of the future design world (Baudrillard & Nouvel, 2002; Proto, 2003).

Designed by Renzo Piano and Richard Rogers, the **Pompidou Center** opened in 1977. In terms of design, it stands out due to the fact that the mechanical (ventilation, electricity and water) and system infrastructures (elevators and escalators) are carried on the facade of the building by pipes with vivid colors in order to create flexible use and adaptable volumes in the interior. The building is designed according to an “evolving spatial diagram” consisting of two parts: First a three-level infrastructure housing technical facilities and service areas; the second is a seven-level expansive glass and steel superstructure, including a terrace and mezzanine, concentrating most of the center’s areas of activity (Url-16; Url-17; Url-18).

Figure 5. Pompidou Center, Renzo Piano & Richard Rogers, France, 1977 (Url-19; Url-20)

According to Baudrillard, the Pompidou Center created a space around it instead of being contextual; drew up an uncertainty, an infinity, and transformed into hyperreality with its flexible, dispersed and transparent spaces. In line with these, it is seen that Archigram is one of the first attempts to embody the machine-city theory in the field of architecture of the Pompidou Center. Being a representative of an ambiguous culture as a result of functionalist theories becoming a product of consequence; the

intense exposure to visitors caused the building to run out very quickly (Baudrillard & Nouvel, 2002; Proto, 2003).

Fondation Cartier has an entirely architecture based on lightness, glass and finely woven steel, in Nouvel's words. The building's sheet glass façades extend beyond the box, blurring its boundaries. It is an architecture that consists in making it unnecessary to read a solid volume. Due to the dominance of glass facades throughout the design, it is uncertain whether the trees in the landscape are indoors or outdoors. In addition, a door is created with a famous 200-year-old Lebanese cedar framed by extra glass walls in the mass. Nouvel takes care to design every façade with precision and care. It features an office space overlooking the backyard and a series of climbing elevators that slide to the side of the building without using wires or cages. The large, flexible spaces used as exhibition spaces are crossed by structural beams spanning sixteen meters without intermediate columns (Url-21; Url-22; Url-23).

Figure 6. Fondation Cartier, Jean Nouvel, France, 1984 (Url-24; Url-25)

All façades of Fondation Cartier are made of glass panels. According to Baudrillard, due to the building's relationship to its surrounding and the glass panels, it is unclear whether what is seen is the sky or the reflection of the sky. In addition, it is not known that, the existence of trees or the number of trees seen, are an illusion due to the two glass panels facing each other. This form of illusion is a dramaturgy of illusion and seduction. Establishing a mental space and a scenic space makes it possible that the city is not just a pile of constructions (Baudrillard & Nouvel, 2002; Proto, 2003).

Biosphere 2 was designed by Peter Jon Pearce in the USA between 1987-1991. The Biosphere 2 facility serves as a laboratory for controlled scientific studies, an arena for scientific discovery and discussion, and a comprehensive public education provider. Biosphere 2 is designed and implemented to serve as a materially close and durable environmental research instrument capable of measuring and sustaining a range of internal environmental conditions while providing the most inert and non-toxic background for inhabited life systems. The building consists of three main parts: The above-ground area surrounded by airtight glass, the underground technology area, and, finally an area designated as a human habitat. Its architecture consists of glass Mayan pyramidal shapes, two large geodesic domes containing the "lungs" of the white Buckminster Fuller-type biosphere, and barrel-vaulted chambers just outside ancient Babylon. Its

wild biomes include a rainforest with a 25-metre waterfall, a grassy tree savanna, a desert with mangrove trees, fresh and saltwater wetlands, and a coral reef in a 150-metre ocean. Biosphere 2 remains the largest vivarium ever built (Miller, 2011; Zabel et al, 1999; Url-26; Url-27; Url-28; Url-29).

Figure 7. Biosphere 2, Peter Jon Pearce, USA, 1987-1991 (Url-30; Url-31)

As mentioned in the World Trade Center building, the built-in objects give Baudrillard a dizzying sense of space. For this reason, while thinking that it is not an architectural wonder like Biosphere 2; he is interested in a singular architectural object that gives a space intoxication. The reason why he is interested in Biosphere 2 is what is the truth of this object that seems to be parachuted from another world. What impresses Baudrillard in Biosphere 2 is not the architectural meaning, but the world he translates (Baudrillard & Nouvel, 2002; Proto, 2003).

Belém Cultural Center is the largest building with cultural facilities in Portugal. The building is originally built to house the Presidency for Europe, but is adapted to provide spaces for conferences, exhibitions and artistic venues (such as operas, ballets and symphony concerts) in addition to political and research congresses with high-security meeting rooms and an exhibition space. Designed in harmony and flush with the Jerónimos Monastery, it deliberately faces the Império Square. Each center is separated by transverse “streets” that connect the building’s interior spaces, which are extensions of Lisbon’s historic urban structure. The centrality of the main building is to create a public space by extending the urban fabric into the interior. This architectural style consists of courtyards and structural blocks called “patios-squares” that connect the three main buildings against a dynamic structure that contrasts with “narrow streets” (Santana & Matos, 2010; Url-32; Url-33).

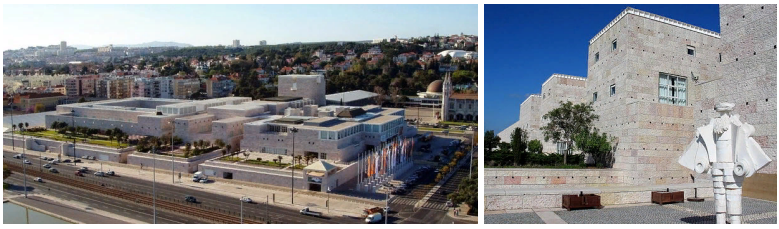


Figure 8. Belém Cultural Center, Vittorio Gregotti & Manuel Salgado, Portugal, 1989-1992 (Url-34; Url-35)

According to Baudrillard, most of the large-scale contemporary public buildings give the impression of emptiness. The works or people in it, appear to be virtual objects themselves. For this reason, empty functionality in spaces is the functionality of useless space. Nowadays, while everything is affected by the metastasis of this empty functionalism culture, the field of architecture has also been affected by this situation. Although the Belém Cultural Center is designed for a functionally different purpose, it is used for artistic activities (Baudrillard & Nouvel, 2002; Proto, 2003).

The Frank Gehry Architecture Office used a 3D design program called CATIA in the design of **Guggenheim Museum** and the forms designed in line with mathematical calculations are turned into reality. Gehry says for Guggenheim that it is "designed to catch the light of the randomness of the curves". The Guggenheim Museum has a curvilinear freeform design built on a steel frame covered with titanium. Gehry claims that the exterior's titanium skin trembles in a strong wind, as if the building is breathing. Its undulating, erotic form curves skyward as if to immerse the visitor in a dream. The spaces of the museum are organized around a large central atrium, a sort of futuristic cave filled with a series of large glazed openings and skylights. The museum strengthens its relationship with the city by directing human traffic along the river and attracting people to the public spaces created by the building (Url-36; Url- 37; Url-38; Url-39; Url-40).

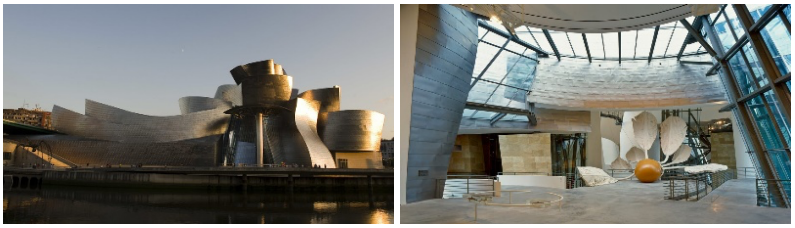


Figure 9. Guggenheim Museum, Frank Gehry, Spain, 1991-1997 (Url-41; Url-42)

According to Baudrillard, the Guggenheim Museum is the product of machines that gain superiority in architectural form due to the fact that more than one similar museum can be built by making changes in software or calculations due to its computer production. The Guggenheim is a spatial chimera. The museum is surprising with its unbalanced structure and illogical lines in its lines; but the indoor exhibition areas are functional (Baudrillard & Nouvel, 2002; Proto, 2003).

Nestled among many scents and lush vegetation, the **Asian Art Museum** is built in the park's lake and reflects the illusion of floating on the water. The white marble covering the walls of the museum gives a sense of solidity, while the glass panels give it lightness. All the strength of the building lies in the alternation between transparency and opacity, lightness and size. In addition to fine-tuned lighting, disappearing glass imaging systems and marble, metal and glass construction materials that do nothing to distract the eye are used. The plan of the museum is based on two basic and traditional Japanese geometric shapes: The square, which is the symbol of

the Earth, and the circle, which is the symbol of heaven. Each pavilion forms the backdrop of a civilization: China, India, Japan and Southeast Asia. Four cubes; it evokes the two main civilizations of China and India and their spread to Japan and Southeast Asia. The first cylindrical floor is reserved for Buddhism, but also includes temporary exhibitions of contemporary Asian artists. It is an enclosed space crowned by a pyramid-shaped glass roof. The building also evokes the Tibetan mandala, a geometric and symbolic representation of the universe that serves as a support for meditation. (Url-43; Url-44; Url-45; Url-46).

Figure 10. Asian Art Museum, Kenzo Tange, France, 1998 (Url-47; Url-48)

Nowadays, architecture largely serves culture and communication. But, according to Baudrillard, museums carry this name only as a name and function as a museum of packaging a social form known as culture. The Museum of Asian Arts remained idle for three or four years, as Baudrillard put it, after the Museum of Emptiness was built, the content could not be found. Therefore, it has become the museum of the void. Most of the large existing public buildings give the impression of space, but not the space. The functions or the people in the space appear to be virtual objects themselves. This empty functionality is the functionality of the useless space (Baudrillard & Nouvel, 2002; Proto, 2003).

CONCLUSION

This study, which focuses on the “other space”, was carried out on the thoughts of Jean Baudrillard. The “other spaces”, which are seen as marginated, draw attention with their consecutives. These are the designs whose differences are seen by both the designer and the user as they are also the consecutives. The “other” of the space is formed by the influence of many factors such as the employer, the designer and environmental factors. The lack of connection of the space with the place, the fact that it feels like it has come from an outer “world”, causes it to be “othered”. According to the form, material, orientation decisions, because of the incompatibility of the design with its environment; the design is marginalized due to the formation of semantic gaps within itself. In this case, it is possible to say that the space is “othered” both materially and semantically.

When the examples discussed within the scope of the study are considered as the “other space”, the contrasts created by the fact that the corridors are undecorated, although the Versailles Theater was built with ornaments and decorations in accordance with the characteristics of the period in which it was built, creates “otherness”. Although Villa Savoye is a building that

represents modernism, the iconic placement of the building on the land and the reflections of the disconnection between the customer and the designer on the design, marginalize the house. While the changes that affect the environmental design due to the design concept of the World Trade Center, ensure harmony with the environment; the effect on the silhouette of the city, the copies of the mass forms and their destruction after the attack, alienate the design. Another example, the Pompidou Center is also alienated due to its relationship with its surrounding. The formal incompatibility of the project area has led the design to its alienation. In addition, the fact that technical systems play an active role in the shell design, apart from the ordinary, has also supported it to be called “other”. Since Fondation Cartier is a building in which glass and transparency are at the forefront, it causes confusion in the perception of the space, which also alienates the design. Since Biosphere 2 is based on the idea of creating a secondary universe, it has been condemned to be called the “other space” through its design idea. Belém Cultural Center serves many purposes other than its purpose; the orientation of the façades, while respecting the historical texture surrounding, reveals an identical space rather than the “other”. Because of its environmental relationship, the Guggenheim Museum -the “Bilbao Effect” in architecture- with its sculptural form, is called the “other space” because the construction was calculated in the computer environment. Asian Art Museum, named by Baudrillard as “The Empty Museum”, is also alienated because it is a design that regains its identity after a period of inactivity.

In general terms; the terrain, silhouette, form, material and function of the design play active roles in the alienation of spaces. However, these factors that cause “othering” ensure that the design draws attention because of being “other”. What needs to be considered in the design process is whether the design is desired to be “other”. By being called the “other”, the design becomes visible and becomes the focal point. Thus, under the design, the phenomenon; the scale of the city where the design is located, the awareness of new developments can be created. The positive effects of the adjective “other”, which is described as negative, can be benefited from.

REFERENCES

Anık, M. (2016). Aykırı Bir Düşünür Olarak J. Baudrillard ve Gösteriş Amaçlı Tüketim. Journal of International Social Research, 9(47), 441-453.

Baudrillard, J. (2014). Cool Anılar I-II 1980-1990. Çev. Ayşegül Sönmezay, 2. Baskı, İstanbul: Ayrıntı Yayınları, pp. 280.

Baudrillard, J., & Nouvel, J. (2002). The Singular Objects Of Architecture: Architecture and Philosophy. Minneapolis: University of Minnesota Press.

Dağ, A. (2014). Ölümcül Şiddet: Baudrillard’ın düşüncesi. 2. Baskı, Külliyat Yayınları, İstanbul.

Eroğlu, Ö. (2007). Jean Baudrillard’a Saygı, İstanbul: Kendi Yayıncılık.

Kızılçelik, S. (1996). Postmodernizm dedikleri, İzmir: Saray Medikal Yayıncılık.

Miller, M. (2011). Spheres, Domes, Limits, Interfaces, The Transgressive Architecture of Biosphere 2. In: Perez-Gomez, Alberto/Comier, Anne/Pedret, Annie: Where Do You Stand? ACSA Annual Meeting Proceedings, 102-110.

Proto, F. (2003). Truth or Radicality? The Future of Architecture. Mass, Identity, Architecture Architectural Writings of Jean Baudrillard. Wiley-Academy.

Santana, C. & Matos, M. C. (2006). Buildings and Urban Form: Investigating Buildings with a Positive Urban Transformation Dimension. 14th IPHS Conference Urban Transformation: Controversies, Contrasts and Challenges, 1-11.

Ulaş, S. E. (2002). Felsefe Sözlüğü, Haz.: A. Baki Güçlü, Erkan Uzun, Serkan Uzun, Ümit Hüsrev Yolsal, Bilim ve Sanat Yayınları, Ankara.

Zabel, B., Hawes, P., Stuart, H., & Marino, B. D. (1999). Construction and Engineering of a Created Environment: Overview of the Biosphere 2 Closed System, Ecological Engineering, 13 (1-4), 43-63.

Url-1, https://en.chateauversailles.fr/sites/default/files/styles/diaporama/public/widgets/diaporamas/cthomas_garnier_tga_6428.jpg?itok=6pxAeeGDs. April 26, 2021.

Url-2, https://en.chateauversailles.fr/sites/default/files/styles/diaporama/public/widgets/diaporamas/cthomas_garnier_tga_6473_0.jpg?itok=7dfpQFV5. April 26, 2021.

Url-3, https://en.chateauversailles.fr/sites/default/files/styles/diaporama/public/widgets/diaporamas/cthomas_garnier_tga_6551_0.jpg?itok=u3kxp1oM. April 26, 2021.

Url-4, https://en.chateauversailles.fr/discover/estate/palace/royal-opera#receptions-and-restoration-work. April 26, 2021.

Url-5, https://www.researchgate.net/publication/337223820_Poster_session_CHATEAU_DE_VERSAILLES_OPERA_HOUSE_A_WOODEN_CONSTRUCTION_WITH_A_RESONATING_CAVITY. April 26, 2021.

Url-6, https://www.arkitektuel.com/villa-savoye-2/. April 26, 2021.

Url-7, https://www.archdaily.com/84524/ad-classics-villa-savoye-le-corbusier. April 27, 2021.

Url-8, http://architecture-history.org/architects/architects/LE%20CORBUSIER/OBJECTS/19

31,%20Villa%20Savoye,%20Poissy,%20France.html. April 27, 2021.

Url-9, https://archeyes.com/the-villa-savoye-le-corbusier/. April 27, 2021.

Url-10, http://architecture-history.org/architects/architects/LE%20CORBUSIER/PIC/VS100.jpg. April 27, 2021.

Url-11, https://archeyes.com/wp-content/uploads/2020/09/Villa-Savoye-House-Le-Corbusier-building-Poissy-France-ArchEyes-terrace2-850x554.jpg. April 27, 2021.

Url-12, https://www.arkitektuel.com/dunya-ticaret-merkezi-ikiz-kuleler/#:~:text=Japon%20asıllı%20Amerikan%20mimar%20Minoru,uzun%20binası%20ünvanına%20sahip%20olmuştur.&text=Yamasaki'nin%20DTM%20projesi%2C%20Güney,pek%20çok%20karşıt%20fikir%20üretmişti. April 25, 2021.

Url-13, https://www.archdaily.com/504682/ad-classics-world-trade-center-minoru-yamasaki-associates-emery-roth-and-sons. April 25, 2021.

Url-14, https://i.guim.co.uk/img/static/sys-images/Guardian/Pix/pictures/2015/5/20/1432125209495/246bc386-03c0-4224-a7f5-540418cf30c4-2060x664.jpeg?width=940&quality=85&auto=format&fit=max&s=429222d107f2e7494e2f1b5bdfff9d03. April 25, 2021.

Url-15, https://www.arkitektuel.com/wp-content/uploads/2017/12/dtm21.jpg April 25, 2021.

Url-16, https://www.centrepompidou.fr/en/collections/our-building. April 25, 2021.

Url-17, https://www.architecturaldigest.com/story/paris-centre-pompidou-satellite-branch-in-shanghai-china. April 25, 2021.

Url-18, http://architectuul.com/architecture/centre-pompidou-1. April 25, 2021.

Url-19, https://www.rsh-p.com/assets/uploads/99_0322.jpg. April 25, 2021.

Url-20, https://s.wsj.net/public/resources/images/BN-RV370_MASTER_GR_20170127125753.jpg. April 25, 2021.

Url-21, http://www.jeannouvel.com/projets/fondation-cartier-2/. April 26, 2021.

Url-22, https://www.archdaily.com/84666/ad-classics-fondation-cartier-jean-nouvel. April 26, 2021.

Url-23, http://architectuul.com/architecture/cartier-foundation. April 26, 2021.

Url-24, https://www.atlasofplaces.com/atlas-of-places-images/_scaled/ATLAS-OF-PLACES-JEAN-NOUVEL-

EMMANUEL-CATTANI-FONDATION-CARTIER-SAT-2.jpg. April 26, 2021.

Url-25, https://www.atlasofplaces.com/atlas-of-places-images/_scaled/ATLAS-OF-PLACES-JEAN-NOUVEL-EMMANUEL-CATTANI-FONDATION-CARTIER-IMG-11.jpg. April 26, 2021.

Url-26, https://biosphere2.org/visit/what-is-biosphere-2. April 26, 2021.

Url-27, https://www.britannica.com/topic/Biosphere-2. April 26, 2021.

Url-28,https://dartmouthalumnimagazine.com/articles/biosphere-2-what-really-happened. April 26, 2021.

Url-29, https://archinect.com/features/article/150119202/screen-print-70-jack-self-revisits-biosphere-ii-the-most-infamous-earth-science-experiment-in-history. April 26, 2021.

Url-30, https://www.visittucson.org/sites/default/files/styles/hero/public/biosphere2-aerial.jpg?itok=P6P-3Lhh. April 26, 2021.

Url-31, https://cdn.britannica.com/18/152718-050-B412DFA8/view-Biosphere-2-savanna-Oracle-Arizona-ocean.jpg. April 26, 2021.

Url-32, http://architectuul.com/architecture/cultural-centre-of-Belém. April 27, 2021.

Url-33, https://archjourney.org/projects/centro-cultural-de-Belém/. April 27, 2021.

Url-34, https://www.ipfn.tecnico.ulisboa.pt/EPS2015/images/ccb.jpg. April 27, 2021.

Url-35, https://upload.wikimedia.org/wikipedia/commons/thumb/c/cf/Belém_Cultural_Center_2.jpg/470px-Belém_Cultural_Center_2.jpg. April 27, 2021.

Url-36, https://www.guggenheim.org/about-us. April 27, 2021.

Url-37, https://www.arkitektuel.com/guggenheim-bilbao-muzesi/ April 27, 2021.

Url-38, https://www.inexhibit.com/mymuseum/guggenheim-museum-bilbao/. April 27, 2021.

Url-39, https://www.arch2o.com/guggenheim-museum-bilbao-frank-gehry/. April 27, 2021.

Url-40, http://architectuul.com/architecture/guggenheim-museum-bilbao. April 27, 2021.

Url-41, https://images.weserv.nl/?url=https://www.guggenheim.org/wp-content/uploads/2016/05/architecture-bilbao-exterior-daytime-2009-web-resized.jpg&w=1170. April 27, 2021.

Url-42, https://images.weserv.nl/?url=https://www.guggenheim.org/wp-content/uploads/2016/05/architecture-bilbao-interior-16-9.jpg&w=1170. April 27, 2021.

Url-43, https://en.nicetourisme.com/nice/184-musee-departemental-des-arts-asiatiques. April 27, 2021.

Url-44, https://www.francevelotourisme.com/loisirs/musees-et-sites-touristiques/musee-departemental-des-arts-asiatiques. April 27, 2021.

Url-45, https://maa.departement06.fr/en/presentation/the-building-13421.html April 27, 2021.

Url-46, https://www.reseau-canope.fr/fileadmin/user_upload/Projets/Preac_Patrimoines_et_creativite_Paca/Transmettre_l_architecture_contemporain_pdf/Musee_arts_asiatiques.pdf. April 27, 2021.

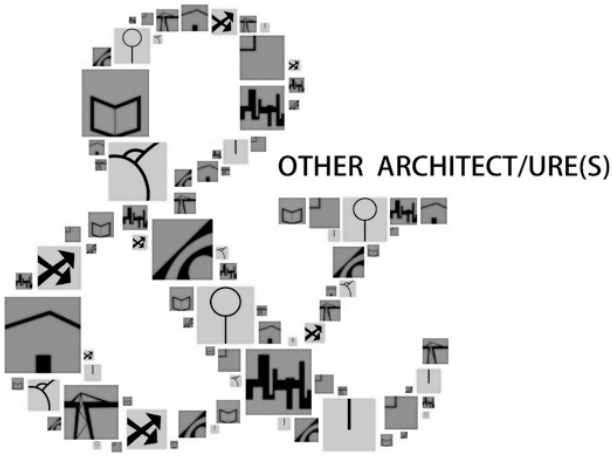
Url-47,
https://www.nice.fr/uploads/media/paysage/0001/03/thumb_2417_paysage_big.jpg. April 27, 2021.

Url-48,
https://lh3.googleusercontent.com/proxy/ywmk7PT6W0jmIsO7EqgZ8_LTE9JhgVXQCpaXwqPqz-YLjmw0_DaR_kWirYxspPYPpYZvli1mi2zW5oODN_lxQtHeokqUMVk6BIjk0ugh1H-DVFOcYX6My0dKb8lnE7X79demRcGsMQO-7F5mi16-qMK-sk4VwIVXc3LJhElDtw. April 27, 2021.

PART V

CRITICISM / METHOD

LIVENARCH VII
livable environments & architecture



7th International Congress
September 28-30 2021 Trabzon TURKEY

LIVENARCH **VII**
livable environments & architecture

INTERMEDIAL PRACTICES IN MAYA LIN'S ART AND ARCHITECTURE

Selda BANCI[1]

TOBB University of Economics and Technology, Turkey
sbanci@etu.edu.tr

ABSTRACT

The conception, execution and reproduction processes in art and architecture, which use several media at the same time, lead to the emergence of interaction and dialogues between and within media. From the interdisciplinary perspective, the nature of the relations between two media is the subject of intermedia studies. Intermedial relations draw attention to the convergence of different forms and the production of new meanings in this process, simultaneously. In this sense, the present study focuses on the forms, concepts and practices of intermediality through American architect and artist Maya Lin's works and creative process. Having placed her own works on the dualities such as science and art, art and architecture, public and private, east and west, and the dividing line between them, Maya Lin's works and design process, in this context, are productive and worth examining. The nature of intermedial creations has been investigated through different media forms such as text, sketch, model, drawing and book; and the epistemology of intermedial practices has been examined through the concepts and practices of reading and writing. As a result of this study, it is showed that intermediality as a tool can be used in constructing new meanings and uncovering new research questions in art and architecture studies, as well as the emergence of different art forms.

Key Words: Intermediality; Architecture; Maya Lin, Intermedia; Media.

INTRODUCTION

Architecture is incorporeal, so it comes into existence only through material things. Although it has centered on the very material thing, i.e. the building throughout its long history, architecture is constructed, produced and reproduced repeatedly by spatial, visual and verbal discourses in the web of relations and the manifold intermedial practices. From the very beginning of the process of its creation, architecture thus appears by media. A design idea does not exist without being embodied in different media, i.e. a generic term for any material form of architecture. A variety of mediums (text, sketch, model, drawing, book…) and practices (writing, sketching, model making, drawing, bookmaking…) provides the designer with convenient niches for discursive formations and offers appropriate space for the construction, circulation and accumulation of meaning.

Despite the obvious importance of mediated architectures, these discourses and practices, however, have attracted attention within the framework of their relations with the final product and considered important to the extent that they are associated with it. The subject of the representation of architecture, Hélène Lipstadt argues, "has for centuries been woven around the theme of the relation of building to its conception" (Lipstadt, 1989, p. 109). As such, mediated architectures, which are often considered as the representation of real architecture, have been marginalized, thus becoming other. The definitions of re-presentation or re-production of architecture in this context, however, are inherently problematic because this understanding of architecture is based on the fact that there is an original and the other exists to re-present or re-produce. Charles Jencks states; "Architecture stays in one place, while its meaning travels between the covers of books" (Jencks, 2002, p. 176), and journeys on media throughout times and places.

In this paper, I put forward the claim that although believed to be of secondary importance, "things-other-than-buildings" -in Hale's term (Hale, 2000), or other architectures are not only theoretical; they are existential. They play important roles in all processes of the conception, execution, production and reproduction of architecture. Architecture, as Juhani Pallasmaa said "… requires a special category of thinking, an embodied thinking through the very medium of architecture itself" (Pallasmaa, 2009, p. 148). Embodied architectural thinking can appear in different forms of existence. Sometimes they are associated with the built forms, i.e. the corporeal structure; sometimes they can also have an independent / free existence. Although, for example, Tschumi contends that "There is no way to perform architecture in a book. Words and drawings can only produce paper space, not the experience of real space. By definition, paper space is imaginary: it is an image" (Tschumi, 1976), other architectures, I believe, can offer new forms of production and produce fake or alternative realities in architecture. As Beatriz Colomina suggests: "Construction is a significant moment in the process, but by no means its end product. Photography and layout construct another architecture in the space of the page" (Colomina, 1996, p. 114). They offer alternative ways for making architecture, and present differences in the context of re-establishing the relations with reality.

I argue that this is why we need them. Nowadays, for instance, we have rediscovered the potential of other architectures (i.e. architectures in media) in responding to the dilemmas and deep crises of architecture. As the other is always there as a set of possibilities for us. Along similar lines, Jean Baudrillard (1993) says that “The Other is what allows me not to repeat myself for ever” (p.174). “Intelligence comes to us from the other - always” (Baudrillard, 1993, p. 126).

Taking this background into consideration, this study tries to explore the forms, concepts and practices of intermediality through American architect and artist Maya Lin’s works and creative process. Lin places her artistic and architectural works on the oppositions, such as between science and art, art and architecture, public and private, east and west, and the dividing line. Thus, her memory works and design process are fruitful and are worth examining within the scope of this study. By focusing on intermedial practices in Maya Lin’s art and architecture, my intention here is to address some of the fundamental questions raised by intermediality: how different media collaborate with each other in (architectural) design process; what alternative forms of interaction are possible between, and within media; and how can meaning and possibilities be produced by them. As such, in the first part of the paper, the theoretical insights -especially based on Irina O. Rajewsky’s study- will be put forward to form a framework for the analysis. In its later parts, the paper discusses intermedial practices in art and architecture through the work of Maya Lin and her own statements.

Somewhere in-between

> I feel I exist on the boundaries / somewhere between science and art / art and architecture / public and private / east and west / I am always trying to find a balance between these opposing forces, / finding the place where opposites meet / water out of stone / glass that flows like water / the fluidity of a rock / stopping time / existing not on either side / but on the line that divides / and that line takes on a dimensionality / it takes on a sense of place and shape (Lin, 2000).

These words sum up Maya Lin’s standpoint as a designer. Stating that she is looking for a balance between opposing forces, Lin’s works take their place “somewhere between science and art, art and architecture, public and private and east and west;” not existing in one of these opposites, but standing on the line that separates them; and “that line takes on a dimensionality it takes on a sense of place and shape” (Lin, 2000). Just like her artworks and architecture, her creative process seems to be based on the interplay between, or within, different media, i.e. text, sketch, model, drawing and the book.

Artists and architects have always need of something material-formal to carry the thought, and use more than one medium in their creative process (Bancı, 2020). Besides the materialization of design idea by means of media, the dialogue between communicative media, where the boundaries between them are blurred, is also considerable for the design process.

While digital and analog media were used together into new hybrids, all media forms converged to each other with the aid of technological change: the drawing, 3d-model and the image in architecture, for example, turned into data consisting of 1 and 0. The process of creation in art and architecture therefore can be seen as intermedial. Intermedial practices not only help the appearance of the design idea, but create the background of the production of meaning.

The term intermedia was theorized by the Fluxus artist and art theorist Dick Higgins (1938-1998) during the 1960s to address the issue of "art forms that draw on the roots of several media, growing into new hybrids" (Friedman & Diaz, 2018, p. 27; Higgins, 1966). Beyond these intermedial artistic productions, however, the term began to take on broader meanings later on. In general, intermediality describes all the phenomena that take place somewhere in-between media (Friedman & Diaz, 2018; Rajewsky, 2005). As a concept, intermediality, additionally, "offers new critical perspectives and methodological developments" to analyze dynamic relations of media (Glaser, 2009, p. 20). Among different forms and concepts of intermediality, my emphasis here is not on comprehending a specific art forms or new hybrids. On the contrary, I employ it as an analytical tool in understanding the design processes in art and architecture and examining the meanings generated through intermedial practices. I am interested in how design thinking comes into existence through intermedia and what meanings are produced in this process.

To define and distinguish different intermedial qualities will undoubtedly be useful for the analysis of certain creative processes and the identification of some characteristics in design. Here, I can refer to subcategories of intermediality, Irina O. Rajewsky proposed for "the concrete analysis of texts or other kinds of media products;" that is, medial transposition, media combination and intermedial references (Rajewsky, 2005, pp. 51–52). Medial transposition is the translation of content from one medium into another. In this product-oriented category, there is an original (source) and a secondary production. I may give film adaptations and novelizations as examples. Media combination can be defined as the combination of two traditional media without losing their materiality. Each media in this combination focused on communication contributes to the formation of the whole with its own characteristics as in opera or comics. As for intermedial references, an absent medium reflects itself by another medium. Hence, they are "to be understood as meaning-constitutional strategies that contribute to the media product's overall signification" (Rajewsky, 2005, p. 52).

In Maya Lin's memory works, art or design process, one frequently encounters with these characteristics which determine the nature of intermedial creations. Even sometime, intermedial creations cannot be predicted before they occur. For Maya Lin, the book *Boundaries* is a continuation, an extension, of her art. She considers it as "a visual and verbal sketchbook." The book is also a good place for intermedial practices where "image can be seen as text and text is sometimes used as image" (Lin, 2000). Or, in the "Bodies of Water" series (2009), we see that the work

of art itself mediates a transposition, an idea of transposition. As Lebowitz points out, “She plays with the idea of ‘bodies’ of water by turning liquid into solid volume and offers an interpretation of these inland seas that is unavailable to the human eye” (Lebowitz, 2008, p. 154). The “Wave Field” (1995) is the manifestation (or translation) of fluid dynamics and aerodynamics in a simple water wave, which also creates an infinite movement that visitors can interact. “Reading A Garden” (1998, in collaboration with poet Tan Lin), on the other hand, is a design where text and space shaped by the user’s movement, and the act of reading. It questions: “What happens when sculpture and words can help to shape each other’s meanings—so that words become descriptive of the spaces they inhabit and the spaces are somewhat shaped by the choice of words?” (Lin, 2000). By the viewer’s direct interaction with the work, a landscape emerges that can be read as much as experienced.

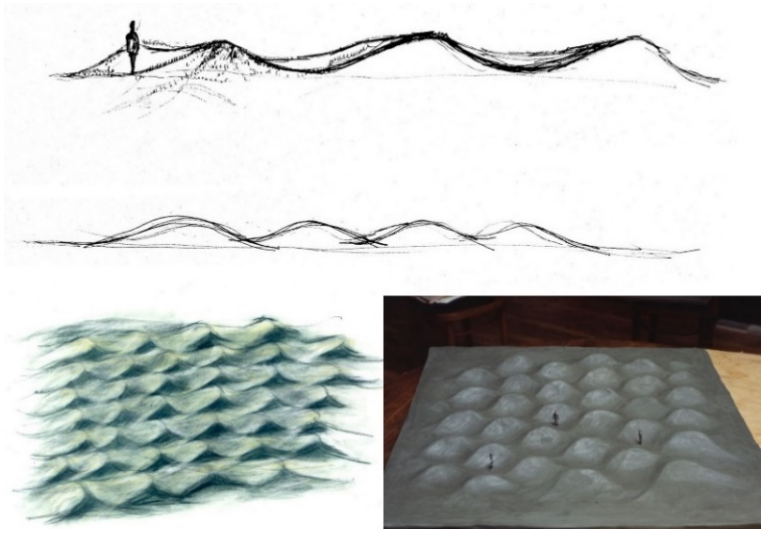


Figure 1. “Wave Field,” University of Michigan, 1995
(https://www.mayalinstudio.com/art/the-wave-field)

Figure 2. “Reading a Garden,” Cleveland Public Library, 1998
Collaboration with Tan Lin, poet; Photography: Rose Marie Cromwell
(https://www.mayalinstudio.com/architecture/reading-a-garden)

Time appears in Lin's works as a layer of viewer experience. The past events and the time of the memorial work come together in the viewer's experience who reads attentively the names and dates on the wall of the "Vietnam Veterans Memorial" (1982). Therefore, "Time becomes the object of the works; the form dematerializes, becoming pure surface as you approach it, so that the text, the information, becomes the object" (Lin, 2000). Through intermedial references, a phenomenon that does not actually exist physically becomes the object of the works. Just like time, movement plays a similar active role in her work, as she cannot see her architecture as "a still moment but rather as a movement through space" (Lin, 2000).

Types of relations between media produce meanings via intermedial practices like reading, as in the Vietnam Veterans Memorial. In Lin's art, the viewer is part of the work. Intermedial practice (i.e. reading) is also a way of establishing a direct and "intimate" dialogue with the audience. The act of reading creates "a private conversation with each person" (Lin, 2000). Here, intermedial creations are open to different readings. Hence, both intermedial processes and relations are based upon multiple meanings, unlike the hermeneutic narratives that define one true meaning inherent in the work; therefore, they are open to various readings and interpretations. It has been discussed for a long time that the art and architectural work as cultural production is not the carrier of one true meaning. As Roland Barthes emphasizes:

> We know that a text is not a line of words releasing a single 'theological' meaning (the 'message' of the Author-God) but a multi-dimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations drawn from the innumerable centers of culture (Barthes, 1977, p. 146).

Accordingly, artists, architects or the author is not the austere genius either who generate this one true meaning. Umberto Eco also discusses the issue with a conceptual framework based on a tripartite classification: the intention of the author (*intentio auctoris*), the intention of the reader (*intentio lectoris*) and the intention of the text (*intentio operis*). He suggests that: "Between the unattainable intention of the author and the arguable intention of the reader there is the transparent intention of the text, which disproves an untenable interpretation" (Eco et al., 2002, p. 78).

Intermedial processes and relations, but nevertheless trust the reader because they are rooted in their imagination. The viewer and/or reader then take an active part in the construction of meaning. Meaning is produced not in the constructed forms, but in the minds of people or readers. To give an example, the water at the "Civil Rights Memorial" (1989) is motionless until a visitor touches the surface. So, Maya Lin "often referred to the studio works as 'mute' objects" (Lin, 2000) because a work of art that has no reader or viewer is quiet. She also says that "I like to think of my work as creating a private conversation with each person, no matter how public each work is and no matter how many people are present." (Lin, 2000). The one-to-one relationship or direct conversation with the audience also determines the

meaning of the work, when there are words to be conveyed, architecture and art converge to media, or we can say that an artistic and architectural dimension is added to media.

The various elements of the intermedial processes are just like "scattered (or fragmented) remains" or "broken pottery shards," which defined as *disjecta membra* in Latin. Jorge Luis Borges also refers different elements in literary description as "disjecta membra" (as cited in Mendelsund, 2014). "Novels have their themes," as Maya Lin said, "but chapters, sentences, even individual words must come together to form the whole" (Lin, 2000). Similarly, often, a single medium, like a still image, is not enough for meaning to emerge. By their nature, intermedial relations provide the opportunity to produce a meaning that cannot be generated by a single medium. Michel Foucault developed the claim that "A statement always has borders peopled by other statements" (Foucault, 1972, p. 97), and

> … there is no statement in general, no free, neutral, independent statement; but a statement always belongs to a series or a whole, always plays a role among other statements, deriving support from them and distinguishing itself from them: it is always part of a network of statements… (Foucault, 1972, p. 99).

Hence, in the words of Maya Lin, the experience to be gained from the work does not fit into a single image. While "a still photograph" of works remains far from adequate expression, "a sequence of still frames pieced together" mediates the formation of a clear understanding / image of the work. The repetition of a single media form or the combination of different media forms is like a text that produces meaning about works: it has a fiction, narrative and/or structure of its own.

Writing–both literally and metaphorically plays an existential role in Lin's creative process. Writing is an intermedial practice that helps her reach a clear picture of what the work is about and why. She starts the design process by writing essays and these "verbal sketches" tell her what the project is. Writing, as allowed her "to clarify and visualize the work, is becoming a material element of her work" (Lin, 2000). Writing describes "the physicality of the work;" furthermore, also outlines how the viewer will experience it. In a nutshell, Lin first explores design as idea without giving it a form, through writing which she regards as "the purest of art forms" (Lin, 2000). As an intermedial practice, writing, just like reading, makes it possible to create subjective narratives from the objective sign and numbers; abstract concepts from the concrete existence, or three-dimensional things from two-dimensional.

CONCLUSION

This study has tried to illuminate some aspects of the productivity of a medium-aware analysis through examining American architect and artist Maya Lin's works and creative process. Being somewhere in-between different things, dualities or opposites, is defining for both Lin's art and design process. The combination, translation or displacement of mediums,

and blurring of their definitions in this process also gives her a productive space for design. In this context, intermedia as a concept, form or as a practice is thus used in this study as an interdisciplinary analytical tool in understanding her art and architecture. Medial configurations which are frequently noticed in Lin's practice were revisited by the subcategories of intermedial analysis, proposed by Rajewsky (2005); namely, medial transposition, media combination and intermedial references. This paper has tried first to show how design idea in Lin's art and architecture came into existence with different media such as text, sketch, model, drawing and the book, in fact with interactions between media. Second, besides the brief analysis of these forms of intermediality, it has attempted to discuss how meaning is produced through intermedial practices that I conceptualize as writing and reading in the case of Maya Lin. So, in conclusion, by focusing on the archaeology of the intermedial creation of Maya Lin and her design philosophy, I hope that this study introduced a line of research to the field of architecture and contributes theoretically and methodologically to the interdisciplinary perspective for new scholarly endeavors taking place between art, architecture and media.

REFERENCES

Bancı, S. (2020). Theory and Practice of Bookmaking: An Experiment in Architectural Design Education. In N. Çağlar, I. G. Curulli, I. Ruhi Sipahioğlu, & L. Mavromatidis (Eds.), Thresholds in Architectural Education (pp. 145–159). ISTE Ltd, and John Wiley & Sons, Inc.

Barthes, R. (1977). The Death of the Author. In S. Heath (Trans.), Image Music Text (pp. 142–148). Fontana Press.

Baudrillard, J. (1993). The Transparency of Evil: Essays on Extreme Phenomena (J. Benedict, Trans.; (first print in 1990)). Verso.

Colomina, B. (1996). Privacy and Publicity: Modern Architecture as Mass Media. The MIT Press.

Eco, U., Rorty, R., Culler, J., & Brooke-Rose, C. (2002). Interpretation and Overinterpretation (S. Collini, Ed.; (first published in 1992)). Cambridge University Press.

Foucault, M. (1972). The Archaeology of Knowledge and The Discourse on Language (A. M. S. Smith, Trans.; (First published in French in 1969)). Pantheon Books.

Friedman, K., & Diaz, L. (2018). The Theory and History of Intermediality. In L. Diaz, M. Dragu, & L. Eilitta (Eds.), Adaptation and Convergence of Media (pp. 25–60). Aalto Arts Books.

Glaser, S. A. (2009). Dynamics of Intermedial Inquiry. In S. A. Glaser (Ed.), Media inter Media: Essays in Honor of Claus Clüver (pp. 11–31). Rodopi.

Hale, J. A. (2000). Building Ideas: An Introduction to Architectural Theory. John Wiley and Sons Ltd.

Higgins, D. (1966). Intermedia. Something Else Newsletter, 1(1), 1–6.

Jencks, C. (2002). Post-Modernism and the Revenge of the Book. In K. Rattenbury (Ed.), This is not Architecture: Media Constructions (pp. 174–197). Routledge.

Lebowitz, C. (2008). Maya Lin: Building Nature. Art in America, May 2008, 152–157.

Lin, M. (2000). Boundaries. Simon&Schuster Paperbacks.

Lipstadt, H. (1989). Architectural Publications, Competitions and Exhibitions. In E. Blau & E. Kaufman (Eds.), Architecture and Its Image: Four Centuries of Architectural Representation – Works from the Collection of the Canadian Centre for Architecture (pp. 109–137). Canadian Centre for Architecture.

Mendelsund, P. (2014). What We See When We Read: A Phenomenology with Illustrations. Vintage Books.

Pallasmaa, J. (2009). The Thinking Hand: Existential and Embodied Wisdom in Architecture. John Wiley and Sons Ltd.

Rajewsky, I. O. (2005). Intermediality, Intertextuality, and Remediation. Intermediality: History and Theory of the Arts, Literature and Technologies, 6, 43–64.

BRINGING THE CASE OF 'FORENSIC ARCHITECTURE': OTHER DISCIPLIN(ARITI)ES FROM WITHIN ARCHITECTURE

Ayşegül ÇAKAN [1], Gökçeçiçek SAVAŞIR [2]

[1] *Dokuz Eylül University, Turkey*
aysegul.cakan@deu.edu.tr
[2] *Dokuz Eylül University, Turkey*
gokcecicek.savasir@deu.edu.tr

ABSTRACT

The idea that a priori autonomous foundations of architecture have still been resonating, exist in architectural theory and conventional architectural practices today. The presence of basic disciplinary dynamics in architecture, and thus its disciplinarity, has always been a hot topic for discussions. Massive, rigid and determinative forms of disciplinarity are not operative for today's interrelated, complex and ever-changing issues. Through the prolific and productive space of interactions within inter/alter/multi/trans/un-disciplinarities, normative standards of architectural practice, together with the notions of 'projective practice', 'design intelligence' and 'strategic design', can be questioned for recreating other disciplinarities in architecture. This paper aims to bring the case of 'Forensic Architecture' for investigating other disciplin(ariti)es in architecture. Positioning on the very margins of architecture, Forensic Architecture as a multidisciplinary research group transgresses the disciplinary boundaries. It defines an emerging new field of practice by curating interrelated evidence from architectural and urban investigations mainly on the forensic cases from the built environment. Adopting a novel form of architectural practice and research method, it refers outstandingly to a variety of methods and tools, and interdisciplinary operation models. In this paper, Forensic Architecture is investigated within the scope of other discipline(ariti)es in architecture by using interpretive qualitative research method. Forensic Architecture's works, assertion, motivation and methods are interpreted by using the literature and qualitative documents such as videos, web pages and interviews related to Forensic Architecture. After an inquiry into different conceptualizations of the disciplinarity in architecture, it is scrutinized regarding the actors, motivations, subjects, operation models, methods, tools, and productions. Thus, this paper claims that the case of 'Forensic Architecture' helps to provide a base for questioning the normative research practices in architecture and to redefine the disciplinary boundaries of architecture for new architectures.

Keywords: Other Disciplinarities; Disciplinarity in Architecture; Interdisciplinary Research; Autonomy in Architecture; Forensic Architecture.

INTRODUCTION

The tendency to accentuate the autonomous disciplinary boundaries, and the questions on the disciplinarity of architectural field have been on the agenda in architectural theory for the last 50 years. Debating on either returning to the internal problems of the discipline of architecture, or seeking the essence and foundation of the discipline, the trend in architectural theory from the 1960s to the 90s, as Krista Sykes states, tries to restructure the discipline through some intermediary concepts for both associating architecture with other disciplines, and demanding autonomy in architecture (2010, p. 14). Autonomy in architecture scrutinizes the tools, methods, norms, principles, field of knowledge, disciplinary boundaries of architecture and its relationship with non-disciplinary agendas and other disciplines. While some of the ontological approaches in the discussion of autonomy focus on seeking and understanding the essence of the discipline of architecture; some other approaches claiming that the discipline is positioned 'in-between' also argue that parts of the discipline is still preserved by remaining original, some of it is transformed under non-disciplinary influences.

Today, disciplinary inquiries are still up to date, but the content of inquiries has been transformed. In contemporary architectural culture, the issues on the basis or the essence of discipline became outdated. Instead, the intellectual debates on discipline's operational range, scope, and its responding capacity to complex problems for exceeding the traditional competence come to the fore. As the world has become so interconnected and made up of different interrelated systems, the conventional forms of disciplinarity have loosen their capacity for responding to unexpected large-scale problems or ever-changing complex problems. Therefore, it has become crucial to consider the ontology of architecture together with the new approaches in other disciplines. This paper claims that merely 'other' forms of architectural practice through inter/alter/multi/trans/un-disciplinary research, namely projective practice, design intelligence and strategic design, can be operative by means of new forms of disciplinary methods, norms, principles for solving today's interrelated, complex, and ever-changing problems. Therefore, this research dwells on the following questions: What 'other' approaches to architectural research and practice are capable of solving today's interrelated and complex problems? What are the actors, motivations, subjects, operation models, methods, tools and productions of these practices? This paper aims to bring the case of 'Forensic Architecture' for investigating other disciplin(ariti)es, which are adaptive and maneuverable for addressing complex non-disciplinary issues. Forensic Architecture (F.A.) is a multidisciplinary research group, seeking for and finding out architectural or environmental based evidence for forensic cases. The violations of rights in all kinds, far beyond the conventional architectural design issues, are its main subject of interest. Therefore, in addition to building survey techniques and architectural representation techniques, it adopts different methodologies and techniques in complex forensic cases, such as virtual reality, situated testimony, geolocation, 3D modeling, audio analysis, filmmaking, image complex, photo-merge, photogrammetry, shadow analysis, data mining and

fieldwork. After conceptualizing the 'other disciplin(ariti)es from within architecture such as inter/alter/multi/trans/un-disciplinary research and practice, the notions of projective practice, design intelligence and strategic design are brought forth. Differentiated from conventional ones regarding its 'otherness', the Forensic Architecture's practices are investigated and interpreted thoroughly. It unfolds the issue by subtitles as *the allegation of Forensic Architecture*, *another way to find evidence*, *another way of witnessing: material testimony*, *other aesthetics from within law and architecture* and *forensic appears in other courts*. This paper asserts that investigating 'Forensic Architecture' helps to provide a base for questioning normative research practices in architecture. While searching for new forms of knowledge, F.A. expands the disciplinary boundaries in architecture and answers societal challenges.

OTHER DISCIPLIN(ARITI)ES FROM WITHIN ARCHITECTURE

Since the 2000s, ontological discussions on the disciplinary structure of architecture have transformed and other disciplinary perceptions have emerged. Roomer van Toorn (2007) criticizes the autonomous approach that reduces architecture only to the act of designing and implementing buildings, and the hidden potential of architecture to find solutions to non-architectural issues. However, other disciplinary approaches emerged in the 2000s expanded the operational boundaries of architecture and redefined its disciplinary boundaries as open to be questioned. The outward-looking and solution-oriented approach in architecture has still been resonating since the early 2000s.

Instead of the rigid and isolated disciplinary perspective created by the critical theory, Robert Somol and Sarah Whiting propose 'projective practice' in architecture, where a performative, practical, knowledge-oriented and pragmatic understanding positive for architecture (2002, pp. 73-74). While projective practice promotes agile and proactive architectural stance which takes action for non-disciplinary and earthly issues, it positions architecture as adaptable to contingencies, contemporary life and real-world issues (2002). According to Michael Speaks, contemporary architecture is forced to come up with convincing solutions to problems whose large-scale effects are not yet known, and this task can be managed by the help of 'design intelligence' that thinks about non-disciplinary issues in architecture. Hence, in the uncertainty created by the new global reality, new issues and architectural practices suitable for development have emerged (2002, pp. 17-18).

Architecture, which is one of the professions that develops strategies for real-world problems, has a more active role in the design decision stage with 'strategic design'. As Boyer stated:

> If traditional design is about giving shape to objects or buildings, then Strategic Design is about giving shape to decisions. In the middle of the design spectrum there's the making of something – a chair, a book, a building – and there's a lot of decisions that come before the thing gets made, and there are a lot of decisions that the thing inflects

> after it enters the world. So being very aware of those sets of decisions within the design process is the role of the Strategic Designer (Boyer as cited in Hyde, 2012, p. 138).

Today, the discipline of architecture is more hybrid and open to cooperation with other disciplines and systems. Hybrid disciplinarities, namely multidisciplinarity (different disciplines cooperating on a subject while preserving their own characteristics), crossdisciplinarity (one discipline's knowledge or perspective is used within another discipline to understand the complex dynamics of issues), interdisciplinarity (creation of new practices by synthesizing one discipline's the knowledge, method, or other components in another discipline), and transdisciplinarity (different disciplines work in a harmonious whole on complex issues and form a new discipline), help to transform older forms of disciplinary approaches and methods. According to Mark Linder (2005, pp. 14-15), the architectural practices on the verge of discipline are more tangled yet having a latent potential. Through this prolific and productive space of interactions within inter/alter/multi/trans/un-disciplinarities (Rendell, 2004; Rendell, 2013; Rodgers and Bremner, 2013), normative standards of architectural practice can be questioned for recreating other disciplinarities in architecture that differ from conventional practices regarding their actors, motivations, subjects, operation models, methods, tools, and productions. Due to today's interrelated, complex and ever-changing issues, as Paul Rodgers and Craig Bremner claims, while disciplinarity is gradually exhausted and dissolved, therefore we need fluid, undisciplined and unpredictable modern design practice, and 'another' dimension as an ‘alternative discipline’ or ‘alterplinarity’. In this new dimension, a new type of practitioner in design disciplines deliberately blurs distinctions and transcends disciplinary boundaries (2013).

BRINGING THE CASE OF ‘FORENSIC ARCHITECTURE’

Forensic Architecture (F.A.) is a research agency founded in 2010 at Goldsmiths University, London, under the leadership of Eyal Weizman. Besides to architects and architectural researchers, its team consists of several specialists, such as software developers, artists, writers, journalists, computational designers, open-source researchers, field researchers, activists, urban designers, film producers, animators, Israeli-Palestinian researchers. The team is one of the extreme examples of contemporary approaches in the architectural discipline that reveal the potential of borderline situations in terms of creating new research areas. Team’s motivations grounds on being a part of the new era of truth, or witness. Thus, F.A. forming ‘another’ research discipline seeking to provide answers to legal problems by means of architecture and its techniques, rather than conventional architectural research, such as research-based innovations at building scale, or researches to improve built environment. As Weizman claims, architecture is more than buildings and it is a field of knowledge as well as a form of interpretation; that is to say, it is meaningful together with people and things from the scale of a human body to human-induced climate change, from the scale of a single house to larger regions, and even

to the world as the ultimate home. Therefore, this agency focuses mostly on legal issues covering a wide range of subjects, including the ever-changing interrelations between people and the spaces or structures in various scales mediating in the analysis of these relations (2014, p. 14). It mainly inquires the cases including murders, migrant pushbacks at sea, police brutality, drone attacks, use of chemical weapons, explosions, torture, detention and environmental violence (such as intentional fires).

Open to collaboration with other research teams in a multidisciplinary environment, the team combines knowledge, methods, techniques and tools from different disciplines such as architecture and urban design, law, computational design, visual arts, journalism. For investigating injustices and human rights abuses, it collaborates to international and non-governmental organizations, such as the United Nations, Amnesty International, and Human Rights Watch. Forensic Architecture collects evidence on legal issues through architectural research; and it further develops new production techniques on forensic evidence by interdisciplinary research in several media techniques as well as architectural ones. The team basically produces concrete evidence by spatializing crime scenes with the help of open-source media and conventional architectural representation techniques together with novel techniques. Forensic Architecture piece together images and videos taken by witnesses or journalists and ‘before’ and ‘after’ satellite images and thus reconstruct the scene of the crime in order to analyse and uncover changes, material deformations and related actors. According to the type of case, accessible data set and type of evidence to be uncovered, the most used methods by Forensic Architecture for analysis are listed as virtual reality, situated testimony, geolocation, 3D modeling, audio analysis, filmmaking, image complex, photo-merge, photogrammetry, shadow analysis, data mining and fieldwork. Their research is also presented at various exhibitions or in courtrooms during litigation.

The Allegation of Forensic Architecture

With a different approach in the process of lawsuit, Forensic Architecture alleges that Roman forum culture has a potential in resolving today's forensic cases. Therefore they aim to bring back the Roman forum culture, in which cases were investigated in a broader perspective with their social, economic, political and cultural dimensions. Weizman pinpoints that the origin of the term forensics is “forensis is ‘pertaining to the forum’ in Latin.” The Roman forum to which the term forensic is related, had many different components such as politics, law and economics, but the meaning of the word has been transformed and as a result the term forum corresponds to court of law and forensics to the use of science within it (2014, p. 9). The transformation of the word's meaning from 'forensis' to 'forensic' explains well the abandonment of the forum culture. According to Weizman, recalling and reinterpreting the Roman forum, as a public place where events on political and legal issues are reenacted in a theatrical way, and its culture have the potential for developing new sensitivities to legal and political consequences of state violence, armed conflicts, and climate change (2014,

p. 9). For Forensic Architecture, new modes of Roman forum have been possible in courtrooms through digital technology; while the team analyzes and filters big data, including open-source information, and reproduces reality in digital environment mostly via architectural models.

The case of 'The Beating of Faisal Al-Natsheh', which was about the statement of Dean Issacharoff as a former officer of the Israeli Army, is a good example of the forum culture. Issacharoff, who is also a member of Breaking the Silence, an organization that works on human rights abuses against Palestinians among Israeli soldiers, confessed to having committed unlawful violence against a Palestinian man while in the army. Subsequently, the Israeli government and former soldiers of Issacharoff's unit denied the incident through a video posted on social media. There was no official court in the case, yet the discussions of many actors, including the witnesses of the incident, the social media users and the media, the Israeli government, and the members of Breaking the Silence, turned into a forum, by which the production of enough evidence contributed to the development of a sense of justice in the public. To gain further confidential testimony, F.A. created a 3D model of the incident site based on a footage of the incident and its environmental data. The two witnesses and Issacharoff walked around in the VR model, which supported their recollection of their memories and thus allowed them to describe the event in more detail (Figure 1). The models of their statements were superimposed, cross-referenced, and cross-checked with other media such as photographs and videos collected from the incident (Forensic Architecture, 2021a).

Figure 1. Dean Issacharoff and a witness describes the moment via VR Environment (Forensic Architecture, 2021b).

Another Way to Find Evidence

Unlike conventional ways of collecting forensic evidence, F.A. refers mostly to the spatial analysis techniques. While F.A. produces forensic evidence

using spatial analysis techniques; they are influenced by the building surveyors. According to Weizman:

> Building surveyors understand a crucial thing missed by most architects: a building is not a static thing. Rather, its form is continuously undergoing transformations and in these transformations it registers external influences. The various material components of a building—steel, plaster, concrete, or wood—move at different speeds in response to the constant force of gravity, the influence of the climate, changing patterns of inhabitation and use, and the unique force of impact. These diffused form-making forces continue the singular form-making practice of the architect. Surveyors see buildings as matter undergoing complex processes of formation—as matter in formation, that is, as information. It is indeed in the material deformations and structural failures that micro and macro forces, political and historical processes might reveal themselves (Weizman, 2014, p. 14).

F.A. analyzes the attacks in conflict zones by examining recorded deformations in buildings. For instance, in the case of 'Drone strike in Miranshah' in Pakistan, the team investigated the apartment that was the target of a drone attack by examining evidence such as the size of the missile, its type, what angle it came from, at what point in the room it exploded, and whether or not there were people in the room at that time. By tracking the marks recorded on the walls. each part of the missile hitting the wall at a different angle, the angle, size, and position of the missile at the time of blast were determined (Figure 2). According to Forensic Architecture the missile, exploded on the midair in the room, gives clues about the type and the producer of the missile. Besides, the wall, which looks like human silhouettes, was not damaged and this showed that at the time of explosion there had been two human bodies in the room had absorbed the fragments and stopped them from reaching the wall (2021c).

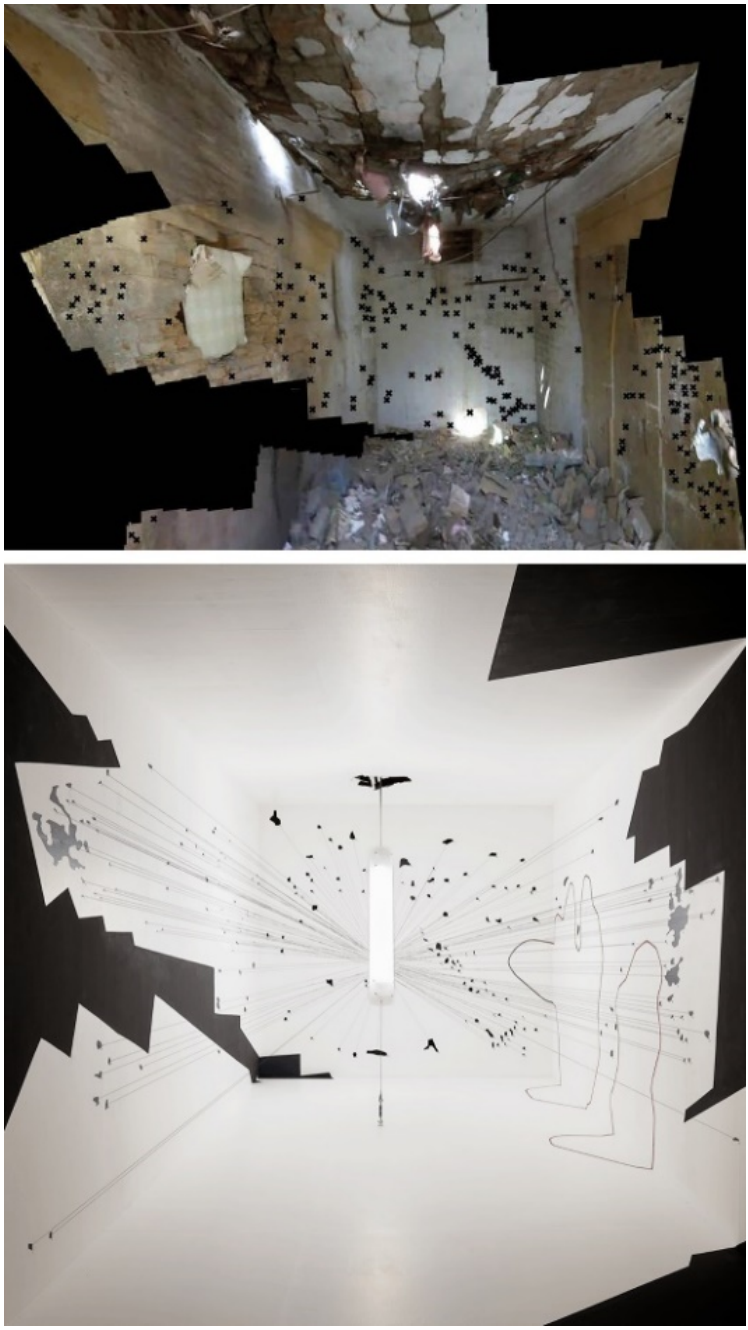


Figure 2. Analyze of ‘drone strike in Miranshah’ (Forensic Architecture, 2021d).

Another Way of Witnessing: Material Testimony

Although human testimony is important in judicial cases, it is not as reliable as material evidence. However, judicial authorities think that the rationality of traumatized people may not be reliable in some cases. Weizman stated that "the shift of emphasis on war crimes and human rights from human testimony to material forensic investigation means that science has begun to occupy some of the legal and cultural grounds previously reserved for the testimony of human witnesses" (Weizman and Herscher, 2011, p. 120). Therefore, concrete and scientific evidence and potential witnessing of materials gain importance. According to Weizman "the courts (…) led to a shift of emphasis from testimony to evidence, from speech to medical data, from the accounts of living people to the testimony of forensic anthropologists" (Weizman and Herscher, 2011, p.121). The motivation of F.A. is to be a part of the new era of truth which is called 'the era of witness'. As Weizman stated:

> I am interested in forensics because it embodies a shift from the speech of humans to the communicative capacity and 'agency' of things. Several legal and cultural scholars have labelled the third part of the 20th century, with its attention to testimonies, truth commissions, and interviews, as 'the era of the witness'. It seems to me that in the field of international law, but also in general political culture, we might have entered a stage when we have become more attuned to the communicative capacity of things, of things speaking, if you like, between themselves and to us (Weizman and Di Carlo, 2010, p. 125).

Forensic Architecture's claim of bringing back the forum culture also promotes the agency of things. In their research practice, all kinds of things besides to the environmental and building data have the potential of being an evidence. Weizman claims that not just people, but everything could speak, as long as they have an interpreter in the forum area (Weizman and Herscher, 2011, p. 121).

In the practices of F.A., environmental and building deformation are accepted as a material witness, or the records of deformations, which encapsulates truth about cases. For the accurate correlations to guide the case, these material deformations are associated with political context, and the technical, architectural, or environmental knowledge. Weizman explains their unique operation model as a way of survey completely different from traditional building survey:

> When architectural surveyors study cracks or other aspects in the structural pathology of a building, they tend to interpret their findings in relation to a narrowly circumscribed set of conditions. They trace material deformations back to force, but in this they have reached the limit of their epistemic frame (Weizman and Herscher, 2011, p. 121).

In 2018, in Douma Syria was having chemical weapons attacks. As Forensic Architecture states, it was claimed right after the incident by the Russian media that this incident was a stage, for which the canister of chemicals had

been carried into incident sites. But F.A. found out strong evidence upon the damage in the building and the transformations on canisters, which showed that the canisters, same as allegedly used in other parts of Syria, had been dropped from air (2021e) (Figure 3).

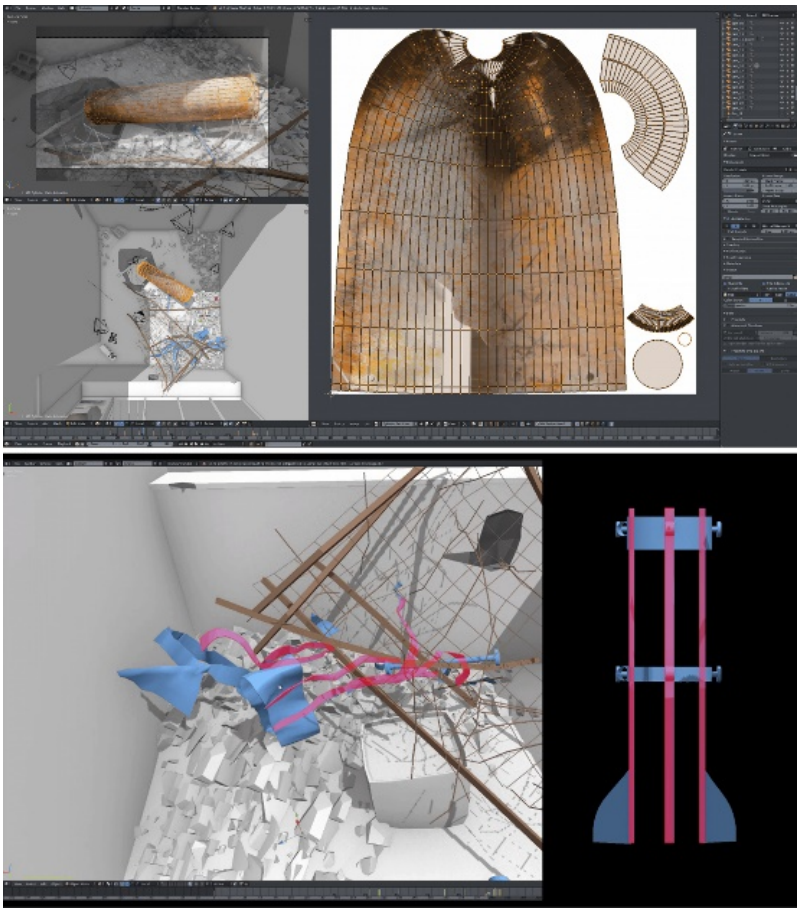


Figure 3. Analyze of 'chemical attack in Douma', Syria (Forensic Architecture, 2021f).

Another case, solved through material agency, was 'The Beirut Port Explosion', where a large amount of data including the contents and the layout of warehouse before the explosion were investigated (Figure 4). As Forensic Architecture underlines, the explosion's videos manifested that different colors of smoke coming out of different parts of the warehouse which means different substances had been burning inside. The photographs, taken inside before the explosion day, and the documents, regarding the contents of the warehouse, revealed the information on the order of items in the warehouse during their stacking. As a result, it was

revealed that ammonium nitrate, seen as the cause of that explosion, was not stored in accordance with the international standards (2021g).

Figure 4. Foam analysis of 'the Beirut Port explosion' (Forensic Architecture, 2021h).

Other Aesthetics from within Law and Architecture

The Forensic Architecture's approach and techniques create different sensory aesthetic beyond the conventional and architectural ones. The space through its materiality keeps records of events and includes a forensic sensibility and aesthetics to the architectural and environmental based evidence (Figure 5). Conceptualized by Forensic Architecture this forensic aesthetics is multidimensional, such that "material aesthetics is the first and fundamental layer of a multidimensional concept of forensic aesthetics. Matter is an aesthetic sensorium in as much as its mutations register minute transformations, variations, and differences within a field of multiple forces" (Forensic Architecture, 2014, p. 748). In addition to materials, today's evidence-making techniques create a new aesthetic through science and technology. Today, new ways of knowing and proving evidently trigger our perception of truth and create a new ethical-aesthetic plane. Forensic Architecture also explains these basically new ways of material approaches:

> Forensic science has signified a shift in the communicative capacity and agency of things. This material approach is evident through the ubiquitous role technologies now play in determining contemporary ways of seeing and knowing. Today's legal and political decisions are often based upon the capacity to read and present DNA samples, 3D scans, nanotechnology, and the enhanced vision of electromagnetic microscopes and satellite surveillance, which extends from the topography of the seabed to the remnants of destroyed or bombed-out buildings. This is not just science, but rhetoric carrying considerable geopolitical, socioeconomic, environmental, scientific, and cultural implications. Forensic aesthetics is thus the mode of appearance of things in forums—the gestures, techniques, and technologies of demonstration, methods of theatricality, narrative, and dramatization; image enhancements and technologies of projection; the creation and demolition of reputation, credibility, and competence (Forensic Architecture, 2014, pp. 745-746).

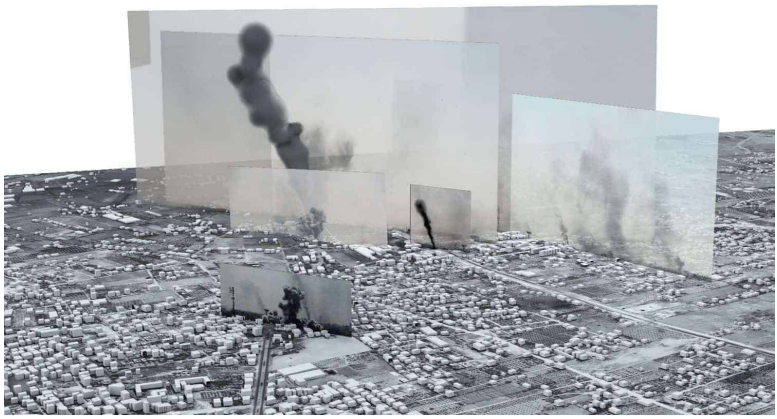


Figure 5. Geolocation of multiple images of bomb clouds in the case of '*the Bombing of Rafah'* (Forensic Architecture, 2021i).

Forensics Appear in Other Courts

Forensic Architecture believes that the places, where the law is allocated, should extend beyond the courtrooms. Therefore, F.A. shares the evidence they produced via various platforms. It takes action to ensure that legal processes spill over into daily life and operate in the public sphere, as well as official judicial institutions. These other courts or forums, outside of formal legal processes, enable people to develop legal sensitivities and access the truth in matters of public concern. According to Weizman, the aim of F.A. is not only to practice for legal domain, but also to perform across political, juridical, institutional, and informal environments (2014, p. 9). By providing access to the truth, F.A. has a significant role in developing legal sensitivity: Its productions are manifested in courts and moreover in a variety of media, such as webpages, articles, books, and exhibitions (Figure 6).

Figure 6. 'Investigative Commons' exhibition in Haus der Kulturen der Welt, Berlin, Germany, 2021 (Forensic Architecture, 2021j).

CONCLUSION

Debates on the disciplinarity of architecture which are self-identifying, self-reflexive and relatively defining rigid disciplinarity have been on architectural agenda during the second half of the 20th century. Although the intellectual debates and inquiries on the disciplinarity of architecture is still up to date, the discussions are directed to the issues on operational capacity of architecture today. By the radical effects of globalization, the world becomes interconnected, and the real-world issues become interrelated. Thus, the conventional and rigid disciplinary approaches in architecture are not capable to address those complex issues anymore. Within this context, the operational limits of architecture can be expanded by the emerging 'other' forms, such as inter/alter/multi/trans/un-disciplinary in architectural research and practice. These other forms in architecture, for instance 'projective practice', 'design intelligence', 'strategic design', and 'medium design' can also operate outside the field through the 'other' tools, methods and principles. Being mostly content or method-oriented, these unconventional approaches use also the 'other' research tools and techniques for solving today's complex problems.

Being an 'other' in contemporary architectural practice, Forensic Architecture seeks for answering to rights violations of all kinds, which are actually not inherent subject in the discipline of architecture. Collaborating with 'other' fields, such as law, new media, visual arts, journalism, and data science, it pushes disciplinary limits. While it is mostly invited by human rights activist groups or official organizations, it also proactively undertakes some cases. According to the variables in each case, such as the type of data they have accessed, the type of case, and the actors involved, it accords the working methods by either developing new methods or adopting the ones from different disciplines. The practice of Forensic Architecture is agile, proactive, adaptive, decision-oriented, solution-oriented, interconnected, alterdisciplinary and interdisciplinary. In this direction, it recalls the potentials of projective practice, strategic design, and design intelligence in architecture. Due to their multidisciplinary and interdisciplinary research in complex forensic cases, it adopts different design mediums, and digital or manual 3D model techniques for finding evidence between objects, actors, built and natural environment.

F.A. promotes and develops another kind of testimony on the records of damages and transformations on materials. In the investigation of forensic cases, it goes beyond the boundaries of normative limits of architectural knowledge and associates it to the political and economic context. It collects as much evidence as possible by the techniques borrowed from other disciplines such as cartography, media and art, as well as the analysis and representation techniques of architecture. Keeping record of evidence through many possible evidentiary narratives in F.A.'s representation techniques, the space points to 'forensic aesthetics' in Weizman's words. The practice of Forensic Architecture reveals that it is possible to take action and create benefits in different issues of real-world through architectural tools. As seen in the case of Forensic Architecture, interdisciplinary interactions in architecture lead to emerge new forms of knowledge and

practice. Cultivating other disciplinarities from within architecture expands the discipline of architecture, diversifies its forms of research and practice, and contributes to the society.

* This paper is developed as a part of an ongoing research for the Ph. D. dissertation with a prospective title, "Autonomy and Pragmatism in Architecture", by Ayşegül Çakan (Advisor: Assoc. Prof. Dr. Gökçeçiçek Savaşır) in Dokuz Eylül University Graduate School of Natural and Applied Sciences.

REFERENCES

Forensic Architecture (2021a, August 15).The beating of Faisal Al-Natsheh. Retrieved from: https://forensic-architecture.org/investigation/the-beating-of-faisal-al-natsheh

Forensic Architecture (2021b). The beating of Faisal Al-Natsheh [image]. Retrieved from: https://forensic-architecture.org/investigation/the-beating-of-faisal-al-natsheh

Forensic Architecture (2021c, August 15). *Drone Strike in Miranshah*. Retrieved from: https://forensic-architecture.org/investigation/drone-strike-in-miranshah

Forensic Architecture (2021d). *Drone Strike in Miranshah* [image]. Retrieved from: https://forensic-architecture.org/investigation/drone-strike-in-miranshah

Forensic Architecture (2021e, August 15). *Chemical attacks in Douma*. Retrieved from: https://forensic-architecture.org/investigation/chemical-attacks-in-douma

Forensic Architecture (2021f). *Chemical attacks in Douma* [image]. Retrieved from: https://forensic-architecture.org/investigation/chemical-attacks-in-douma

Forensic Architecture (2021g, August 15). *The Beirut Port explosion*. Retrieved from: https://forensic-architecture.org/investigation/beirut-port-explosion

Forensic Architecture (2021h). *The Beirut Port explosion* [image]. Retrieved from: https://forensic-architecture.org/investigation/beirut-port-explosion

Forensic Architecture (2021i). *The Bombing of Rafah* [image]. Retrieved from: https://forensic-architecture.org/investigation/the-bombing-of-rafah

Forensic Architecture (2021j). 'Investigative Commons' exhibition [image]. Retrieved from: https://forensic-architecture.org/programme/exhibitions/investigative-commons

Hyde, R. (2012). Future practice: Conversations from the edge of architecture. London: Routledge.

Linder, M. (2005). TRANSdisciplinarity. Hunch: The Berlage Institute Report, (9), 12–15.

Rendell, J. (2004). Architectural research and disciplinarity. arq: Architectural Research Quarterly, 8(2), 141-147.

Rendell, J. (2013). Working between and across: Some psychic dimensions of architecture's inter- and transdisciplinarity. Architecture and Culture, 1(1), 128-140.

Rodgers, P. and Bremner C. (2013). Exhausting discipline: Undisciplined and irresponsible design. Architecture and Culture, 1(1), 142-161.

Somol, R., and Whiting, S. (2002). Notes around the Doppler Effect and other moods of modernism. Perspecta, (33), Mining Autonomy, 72-77.

Speaks, M. (2002). Design intelligence part 1: Introduction. A+U Architecture and Urbanism, (387), 10-18.

Sykes, K. (Ed.). (2010). Constructing a new agenda: Architectural theory 1993-2009. New York: Princeton Architectural Press.

van Toorn, R. (2007). No More Dreams? The Passion for reality in recent Dutch Architecture... and Its Limitations. In William S. Saunders (Ed.) The New Architectural Pragmatism: A Harvard Design Magazine reader (pp. 54–75). Minneapolis, MN: University of Minnesota Press. Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-108573

Weizman, E., and Di Carlo, T. (2010). Dying to speak: Forensic spatiality. Log, (20), 125-131.

Weizman, E., and Herscher, A. (2011). Conversation: Architecture, violence, evidence. Future Anterior: Journal of Historic Preservation, History, Theory, and Criticism, 8(1), 111-123.

Weizman, E. (2014). Introduction: Forensis. In Forensic Architecture (Ed.). Forensis: The architecture of public truth (pp. 9-32). Berlin: Sternberg Press.

SQUATTER HOUSING AS AN "ALTERNATIVE OTHER" FOR ARCHITECTURAL THINKING

Öncü Özalp[1]

[1] *Middle East Technical University, Turkey*
oncu@metu.edu.tr

ABSTRACT

This paper aims to revisit how architectural thinking can engage with squatters in multiple strains by overcoming the concept of *other*. While the definition of the word *squatter* appears as "a person who is living in a building or on land without permission and without paying rent" in the dictionary, *slum* is elaborated as an "area of a city that is very poor and where the houses are dirty and in bad condition" (Oxford Learner's Dictionaries). In addition to various dictionary resources' similar approach, which defines these settlements from the outset and solely illustrates how the physical landscape appears or refers to being *legal* or *illegal*, those pejorative adjectives also appear in the discourse pattern of squatter studies. However, there exists very influential, detailed, and comprehensive scholarly literature on squatters, which go beyond the limits mentioned above. Although those studies predominantly explore economic, political, and social dimensions of those settlements, approaching them as a design proposal, embracing them for the interpretation of new alternatives for both housing and the process of settling in the cities as a source of problem-solving are also implicit in their engagement with the research process. In this paper, I aim to revisit the studies, which overcame the concept of *other* and elaborated squatters with their spatial and unique qualities as a source of knowledge and an alternative to be explored.

Key Words: Squatters; *Gecekondu*; Architecture of Squatters; Alternative Architectures; Squatters as the Other

Politics/ Policies/ Laws/ Regulations/ Ethics

Human/ Behavior

Technology/ Material/ Sustainability

Philosophy/ Theory/ History/ Discourse

Criticism/ Method

Identity/ Culture/ Tradition

Urban/ City/ Landscape/ Rural

Design

Interior Design

Conservation/ Transformation/ Re-use

Education

Arts/ Aesthetics

INTRODUCTION

This paper is based on the author's Master's thesis submitted to the Department of Architecture at METU and supervised by Prof. Dr. Güven Arif Sargın. The author's Master's thesis is titled *The Transformation of Gecekondu Phenomenon via Visual and Spatial Narratives*. I present my deepest gratitude to my thesis supervisor Prof. Dr. Güven Arif Sargın for his invaluable contributions, intellectual support, guidance, motivation, and for his profound influence on the formation of this study. I would also like to express my sincere gratitude to Prof. Dr. Tansı Şenyapılı and Prof. Dr. Önder Şenyapılı for their persistent generous help, encouragement, inspirational talks in the past years, and lastly, for their thrust in donating their invaluable and very inspirational personal archives to me.

This paper includes two parts. The first integrates how squatters entered into epistemological studies of modern city planning, informed architects on their approaches towards design problems, and how they became more than a case by being an epistemic source for the development of design phases. The second part focuses on studies, which engage with the *gecekondu* phenomenon in multiple dimensions, overcome the *concept of other* and provide critical approaches for architectural thinking.

Squatters as an Epistemic Entity

On changing approaches towards modern city planning during the post-war politics of colonial modern, Marion von Osten notes that by the simultaneity of the articulation of new ideas on urban planning with the process of decolonization, the new generation of architects started to study everyday life including *bidonvilles* and shantytowns. For the writer, modern planning of cities, which were realized in colonial regions became an experimental field of European urban planners (includingarchitects) and with the involvement of colonialism on city planning, colonial modernity brought about exploitation, racial division, and oppression processes. To explain the changing undertakings of modernism, the writer discusses that with the project entitled *In the Dessert of Modernity*, which includes projects from North Africa and Morocco, it is more clear that modernism in the post-war period was prone to a shift in paradigm because it indicates a change from morphological studies to local area surveys with particular attention to the practices of everyday in local settlements including squatters. As put by the writer, with the process of decolonization and young European architects' interest in the strong integration between the idea of a street, house, district, their interrelation in the city scale strengthened and evoked deep thinking into possibilities of their togetherness. The CIAM IX meeting in 1953 indicted this change in architects' new approaches to urbanism, with the concept called *Grids* (Von Osten, 2010).

Figure 1. Page spread from the book Another Modern: The Postwar Architecture and Urbanism of Candilis-Josic-Woods, which indicates Urban Regeneration Grid and GAMMA Grid

Source: (Avermaete, 2005, p.76-77).

Insightful readings of *Urban Regeneration Grid* (by Alison and Peter Smithson) and *GAMMA Grid* (by Georges Candilis and Shadrach Woods) can be followed from the comprehensive study of Tom Avermaete, which points out different conceptualizations and interpretations of the everyday concepts in those Grids. As the writer illustrates, while the *GAMMA Grid* included everyday photographs from *bidonvilles* in North Africa, accompanied by other indigenous units' photographs, and visuals of grid housing units in Morocco for making comparisons, Candilis and Woods looked at the positive aspects of *bidonvilles* by following the patterns of the elements of the everyday and human activities. For Avermaete, the texts appeared in capital letters as *assumptions*, *associational components*, and *physical components* on the *Urban Regeneration Grid* indicate the importance of proposing *assumptions* about everyday life in slums and suburbs in the formation of ideas about urban life (Figure1). For instance, for Alison and Smithson, *associational components* are related to the ideas of *street, alley, square* and their social and spatial dimensions, including all activities taking place. Following the writer's inspiring remarks, in addition to including the study of *bidonvilles,* slums, and rural settlements, both Grids pointed out the everyday scenes in those dwellings introduced everyday practices' entrance into the formation of architectural knowledge (Avermaete, 2005).

Also, about *anonymous architectures*, *Architecture Without Architects: An Introduction to Non-pedigreed Architecture* was published alongside the exhibition at the *Museum of Modern Art* in 1964. Bernard Rudofsky discusses the domination and overriding impact of Western discourse on the formation of architectural history and selective approaches of

architectural historians, which had been overlooking *non-noble* dwelling examples at the very beginning of the preface of the book. Rudofsky points out the relevancy and significance of *anonymous*, *rural*, *indigenous*, *spontaneous* architectural formations by providing examples from Chincheros (Muyu-Uray Amphitheaters), Carnac (Alignments in Carnac), Ispica (Valley of Ispica) and many others with certain emphasis on how natural landscape and materials could be transferred into creative forms of living. The writer also forwards concepts to intensify the relations between nature and humans in the formation of shelters. By introducing cases, which were realized through the act of subtraction Rudofsky emphasizes different approaches towards distinctive site conditions through giving subtitles such as *aquatic architecture*, *nomadic architecture*, *architectural mimicry*, and draws attention to the changing concept of landscape, qualities of endurance, materials on the transformation of the natural environment. Although the content of the book seems distant from squatters by looking at the case studies, emphasizing *anonymous architecture*, suggesting knowledge in dwelling making, and giving reference to dwellers intervention into their habitat, Rudofsky's body of work becomes important in rendering dwellers as active beings in their living environment (Rudofsky, 1964).

Gecekondu* and the concept of *Other

According to İbrahim Yasa, *gecekondu* integrated into the daily language during the Second World War in order to define emerging self-made housing units alongside others terms such as *dolmuş*, *hacıağa*, and *hava parası* which can be translated respectively as *a shared taxi*, an *upstart*, and an *additional fee paid by a leaser in addition to the actual required fee* (Yasa, 1983). While the closest translation of the word *gecekondu* can be elaborated as *landed/put at night*, as being a compound word that includes *gece* as a period of time being more unlikely to encounter a demolition attempt and *kondu* by referring to temporality, it can also be defined as self-reflective, which aligns with its urban history.

Before entering into the discussion of how the *concept of other* entered into *gecekondu* studies through elaborating the work of Tahire Erman, different processes of *gecekondu* making and the extreme conditions migrants encounter during the first flows to the cities will be a helpful introduction to provide an insight into the self and mutual solutions towards the dwelling needs. On the process of first migration groups, Fehmi Yavuz notes *gecekondus* were made with simple techniques, out of used cans, muds and old rugs as enclosure (Yavuz, 1952). Similarly, as Tansı Şenyapılı illustrates, between 1947-1950, because of extreme monetary restrictions, migrants used techniques such as digging soil and enclosing it with rugs and settled nearby old graveyards in the cities (Şenyapılı, 2004). (Figure2).

Figure 2. A newspaper article on the formation of assemblies of new migrants in the cities.

Source: Salt Research, accessed March 3, 2017, http://saltresearch.org/salt:digitool_salt356699

I intentionally use the verb *to make* rather than *to construct* to emphasize the first required labor power and mutual help, which were provided by the dwellers during the process of making, rather than the verb *to construct* as it tends to invest the reference towards an external labor irrespective of dwellers with a systematic undertaking. As some scholars use, *architectonics* also is an important term while approaching *gecekondus*, it overcomes physical conditions not through the concept of other, yet encourages both the technical aspects and social relations involved in the process of production (Turan, 1987).

Approaching non-Western architectural histories and elaborating translation theories to trace the circulation of *ideas*, *technologies,* and *information* between different geographic locations, Esra Akcan notes that challenging and rejecting colonial concepts such as *civilized and backward* can overcome misleading concepts, and can prevent the domination of a central reference, which tends to create every other entity as an *inferior copy* or a *second-hand* derivative. The writer uses linguistic translation as a framework to articulate how one society communicates with another because cultural translations are not direct acts and *smooth phases* yet includes many participants, power and capital relations (Akcan, 2012). Although Akcan's study develops upon translation theories, it is important to observe how the concept of other is related with those that the writer criticizes, including colonial terms, comparisons and fixed assumptions.

On the concept of other, Tahire Erman provides changing critical approaches towards *gecekondu* phenomenon, particularly how *gecekondu* dwellers were represented in academic studies. For the writer, both the 1950s and 1960s pointed out the concept of *the rural other*, the 1970s and first section of the 1980s illustrated *gecekondus* as *the disadvantaged other,* the *second half of the* 1980s till the mid-1990s portrayed them as the *culturally inferior Other(s) as Sub-culture,* the *urban poor Other(s)*, and *undeserving rich Other(s)*; and finally the studies in the late 1990s suggested the *threatening/varoşlu Other* (Erman, 2001). As Erman notes, studies realized in the first time interval elaborated above undertook modernization theory as a framework, prioritized existing urbanities' patterns as references, searched to which extend migrants *urbanized* by relinquishing their *rural characteristics*; the second time period developed a more insightful approach and emphasized disadvantaged conditions of migrants with the introduction of Marxist frameworks in their studies; the third period integrated the concept of *sub-culture*, a relatively lukewarm approach than that of the first period's comparison between the rural and the urban yet still integrated pejorative aspects by suggesting inferior connotations with its prefix; and finally the writer proposes the emergence of the term *varoşlu* both in the media and in daily use, its broad negative use in social, economic political dimensions (Erman, 2001). Also, concerning the two-sidedness of the concept of *integration,* Tansı Şenaypılı's discusses that although migrants were well-articulated into economic spheres by the transition of their labor from *marginal* to *functional* and thus creating a relatively enduring relation with the city; their integration into the urban space was considerably restricted (Şenyapılı, 1998). This indicates degrees of otherness and how the labor of migrants was welcomed in the economic space yet their social integration kept limited. Similarly, about the exclusion of migrants in the urban space from the perspective of existing urbanities in the cities, İlhan Tekeli elaborates the concept of *artificial villages*. For the writer, *by rejecting the possibility of the emergence of a unique culture,* the perspective of older urbanites encapsulated migrants in the *conceptual artificial villages* and they were described *as peasants in* cities (Tekeli, 2008). Also, regarding the concept of alternative architecture, the influential proposal of İlhan Tekeli brings *gecekondus* into focus from a different perspective, especially about the concept of *other* by emphasizing their importance both in urban and housing

scale. In 1979, Tekeli suggested *gecekondus* as a proposal to be considered as a candidate for *Aga Khan Award*. As the writer presents via his correspondence letters to Aga Khan Awards Committee, the proposal did not refer to a specific neighborhood, location or city. The writer points out the significance of referring *gecekondus* without a particular positioning in space and time and forwards the idea of an inclusive approach rather than emphasizing a particular over others. The writer's proposal on *gecekondus* as a whole, an encompassing viewpoint stems from the creative solutions all *gecekondus* provide in respect to emerging problems for housing. (Tekeli, 1981).

Also, Tansı Şenyapılı brings forth another important dimension of *gecekondus* by discussing the quality of *flexibility* as a spatial quality. While exploring the movement pattern of *gecekondu* dwellers in economic space, the writer emphasizes that because rural migrants did not have competency in entering experience required service sector, they mediated between loosely organized developing sections. As small scale urban labor market did not have an established organization and did not have any negotiation over salaries, a shrink in one of the sectors as unemployment resulted a direct shift to a new job, which did not necessarily require distinguished skills. This *mobility* and *flow* in the economic space, for Şenyapılı, found its relative impact on the *gecekondu* as *flexibility* (Şenyapılı, 1998). That is to say, an increase in the income of the *gecekondu* dwellers and its reflection on the spatial units of *gecekondu* as an expansion enables active dwellers, who can transform their surrounding according to emerging needs during the best suitable condition (Figure 3 and 4).

Figure 3. Expansion of two *gecekondus* throughout years, material changes are visible from the relatively new added units.

Source: Tansı Şenyapılı archive.

Figure 4. A *gecekondu* and its evolvement.

Source: Photographs and plans were provided from Tansı Şenyapılı archive, analysis by the author.

In his works, Mehmet Adam draws attention to the use value of *gecekondus* and elaborates the ills of the commodification of *gecekondu* neighborhoods with the intervention of intermediary actors. As Mehmet Adam and Erhan Acar point out, *gecekondu* phenomenon had been prone to enormous changes with the capitalist developments. Writers indicate the existence of *gecekondulu*, who maintained their first aim in the urban land as they regard *gecekondu* only *as a means of dwelling* without the attempt of transforming it into an exchange value. Yet, initial collective activities including *gecekondu* making processes and *invasion of land* were being replaced by the landlords' domination over the social formations in *gecekondu* neighborhoods. For the writers, this change impaired shared past experiences of hometown dwellers, kinship ties, local networks, collective activities and fostered informal but highly organized interest formations, which included selling already invaded lands as commodities for newcomers (Adam and Acar, 1978).

Mehmet Adam's inspirational works also provides solutions for *gecekondu* population regarding the problems they encounter during the making phases of gecekondu. The logbook entitled *Tekevler Düzeyinde Gecekonduları İyileştirmeye Yönelik İlk Öneriler* presents the studies of the third year Architectural Design studio at Middle East Technical University, which was coordinated by Adam (Figure 5). The document provides suggestions for site arrangement in relation to slope, required spanning for structural elements, drainage and insulation details, proper order of layering for roofs, and other system insulations with necessary notes.

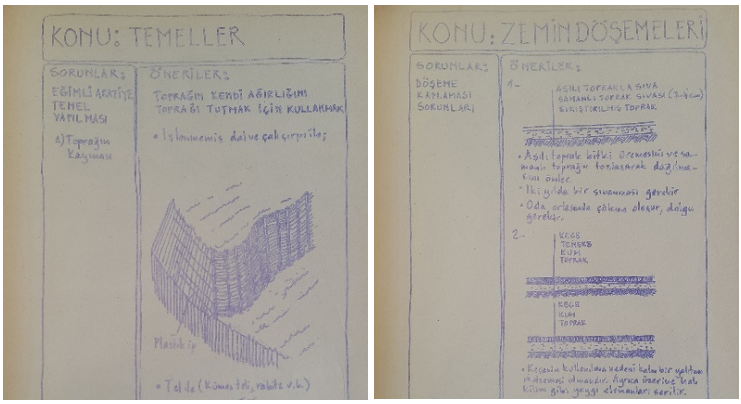


Figure 5. METU ARCH302 Studio Works. The logbook was the outcome of Mehmet Adam's studio section between 1978 and 1979.

Source: Studio booklet of Mehmet Adam.

In addition to Adam's studies for the betterment of the physical conditions of *gecekondu* space, his approach towards *gecekondu* phenomenon about qualitative dimensions emphasizes one of their potentials as maintaining accumulated knowledge, skills and experiences of rural life, and more importantly points out the insights of dwellers. For Adam, although those rural habits ceases in the city to a certain extent, they still provide finding creative solutions to emerging problems. In his book *Almaşık Yeniden Üretim Süreçleri İçin Konut Alanları*, which also influenced the title of this paper as *alternative architecture,* the writer provides his close observations on *gecekondus* and points out the importance of the form of life in those settlements. For Adam, gardens with farming use, seasonal stock of foods, knitting for clothing, providing tiny barns with dwelling units, using materials and their utilization for *gecekondu* making indicate continuation of the rural practices in and around *gecekondus*, which are individual activities at the level of domestic production and are unorganized at the level of neighborhood. The writer's further proposals take references from the organization of those activities at the scale of social production and their further protection within the formation of cooperatives to make sure that acquired values from the social productions will equally be distributed and will not be exploited (Adam, 1979). (Figure 6 and 7). Also, the comprehensive study of Bülent Batuman elaborates Mehmet Adam's body of work and provides a critical cross reading of his collaborative and individual studies. As Batuman articulates, according to Adam's approach, the potentials that *gecekondus* constitute inherently can provide *solutions for housing questions* (Batuman, 2006). By defining Adam as one of the actors of the *1960 generation* and elaborating the team work between Adam, İrem Acaroğlu, and Erhan Acar as the *Board of Mayoral Experts* in the Municipality of Ankara; the writer pinpoints the important aspects of the collaborative Batıkent project with its important *organizational model* that was informed by gecekondus in terms of *social organizations* and *housing environments* (Batuman, 2006).

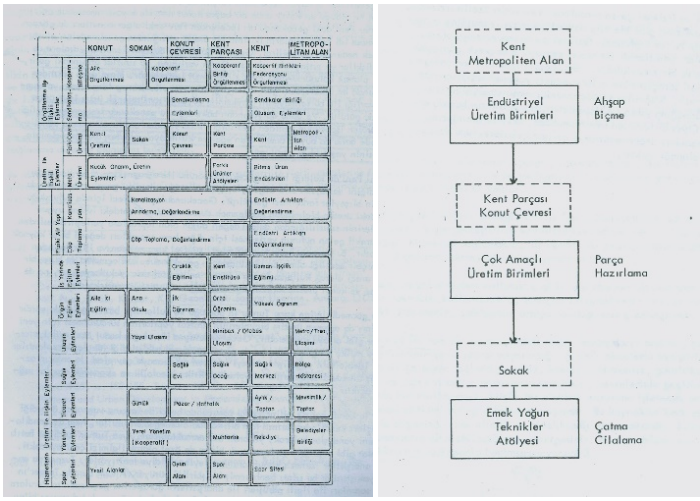


Figure 6. Interraledness between production activities from the scale of a house to a neighborhood.

Source: (Adam, 1979, p.57, 59).

CONCLUSION

As squatters and *gecekondus* are not merely problems of housing and constitute deep relations with the city, which also change in reference to different time periods, diving deep into and social, political, and economic dimensions beneath them unfolds multidimensional facets of those settlements (Adam 1979, Şenyapılı 1981, Tekeli 1981, Turan 1987, Batuman 2006). Revisiting site studies about those settlements in consideration to architectural thinking point out that squatters turned into a body of work and became a source of knowledge for architects' new approaches. As indicated in this paper, the works of Alison and Peter Smithson, and Georges Candilis and Shadrach Woods focused on the everyday life in squatters and the epistemological pattern formed within those introduced new concepts for modern city planning. Also, following comprehensive studies in different disciplines in Turkey indicate how *gecekondu* phenomenon was experienced in different time periods and was informed by economic, social and political impetuses. It is important to note out that each time period of *gecekondus*' urban history brings about new conceptualizations including the concept of *other*. Studies which went beyond this provided distinctive qualities of *gecekondus* emphasized their contributions as a form of unique dwelling, potentials that could have been changed and possibilities to define cities with positive aspects such as gardens and how dwellers can integrate into the social and economic space. Within the scope of this paper, following Tansı Şenyapılı's works, *gecekondu* as a flexible unity, which responded to the dwellers' needs by *expansion* and increase in the income of families, revisiting Mehmet Adam

on the ills of commodification of *gecekondus* and prevention of their assessment over an exchange value, and finally elaborating İlhan Tekeli's articulations on dwellers as creative participants, their self-made solutions altogether suggest alternatives and guidelines for new ways of thinking architecture from a larger framework.

ACKNOWLEDGEMENTS

This paper is based on the author's Master's thesis submitted to Department of Architecture at METU and supervised by Prof. Dr. Güven Arif Sargın. The author's Master's thesis is titled as *The Transformation of Gecekondu Phenomenon via Visual and Spatial Narratives*.

I present my deepest gratitude to my thesis supervisor Prof. Dr. Güven Arif Sargın for his invaluable contributions, intellectual support, guidance, motivation and for his profound influence on the formation of this study. I would also like to express my sincere gratitude to Prof. Dr. Tansı Şenyapılı and Prof. Dr. Önder Şenyapılı for their persistent generous help, encouragement, inspirational talks in the past years, and lastly, for their thrust in donating their invaluable and very inspirational personal archives to me.

REFERENCES

Adam, M. (1979). Almaşık Yeniden Üretim Süreçleri İçin Konut Alanları. Ankara: TMMOB Yayınları

Adam, M. Acar, E. (1978) "Kapitalistleşme Sürecinde Gecekondu," Mimarlık 156, no. 3. 33-34

Akcan, E. (2012). Architecture in Translation: Germany, Turkey, and the Modern House Durham, N.C: Duke University Press

Avermaete, T. (2005). Another Modern: The Postwar Architecture and Urbanism of Candilis-Josic-Woods Rotterdam: NAi Publishers

Batuman, B. (2006). Turkish Urban Professionals and The Politics of Housing, 1960-1980. Middle East Technical University Journal of the Faculty of Architecture no.23(1), 59-81

Erman, T. (2001). The Politics of Squatter (Gecekondu) Studies in Turkey: The Changing Representations of Rural Migrants in the Academic Discourse. Urban Studies 38, no. 7, 983-1002

Rudofsky, B. (1964). Architecture Without Architects: An Introduction to Non-pedigreed Architecture New York: Museum of Modern Art

Şenyapılı, T. (2004). Baraka'dan Gecekonduya Ankara'da Kentsel Mekanın Dönüşümü: 1923-1960. İstanbul: İletişim Yayınları

Şenyapılı, T. (1998). Cumhuriyet'in 75. Yılı, Gecekondu'nun 50. Yılı. In.Y. Sey (Ed.). 75 Yılda Değişen Kent ve Mimarlık 301-316. İstanbul: Tarih Vakfı Yayınları

Tekeli, İ. (1981). Aga Khan Mimari Ödülleri İçin Bir Öneri: Gecekondu. Bilim ve Sanat, 87-92

Tekeli, İ. (2008). Göç ve Ötesi. İstanbul: Tarih Vakfı Yurt Yayınları

Turan, M. (1987). Poverty, prudence, and Place-making: Strolling through Gecekondus. Habitat Internatiaonal 11, no. 3, 77-102

von Osten, M. (2010). In Colonial Modern Worlds. In T. Avermaete, S. Karakayali, von Osten. M (Ed.). Colonial Modern: Aesthetics of the Past, Rebellions for the Future 19-37. London: Black Dog Publishing.

Yasa, İ. (1966). Ankara'da Gecekondu Aileleri. Ankara: Sosyal Hizmetler Genel Müdürlüğü Yayınları

Yavuz, F. (1952). Ankara'nın İmarı ve Şehirciliğimiz Ankara: Siyasal Bilgiler Fakültesi Yayınları

RHIZOME AS OTHER IN "MORPHOLOGIE CITY METAPHORS"

Kübra SAĞLAM[1], Serap DURMUŞ ÖZTÜRK[2]

[1]KTÜ Department of Architecture, Turkey
kubrasaglam@ktu.edu.tr
[2]KTÜ Department of Architecture, Turkey
serapdurmus@ktu.edu.tr

ABSTRACT

"Other" is a concept that can be handled in various disciplines throughout the historical process with its rich meaning. Within the scope of this paper, the relationship between architecture and the other has been associated with the concept of rhizome, which is a contemporary discussion topic. Supporting decentralized and hierarchical relationships instead of the tree-based model generated by the West, the rhizome is a metaphor with the potential to create new connections and networks. In this context, the rhizome was handled at the city scale in architecture and a rhizomatic reading was made through the book "Morphologie City Metaphors". There is a conceptual expression for each form-metaphor pair in the book, which includes city forms and metaphors matching these forms. Three of the six principles of the rhizome have been made use of, as they are more suitable for evaluating a form in reading. City forms were evaluated in accordance with the rhizome principles and the metaphors matching the forms in accordance with the rhizome principles were selected. Potential rhizomatic networks have been created through city forms and metaphors. As a result, a rhizomatic map was obtained by overlaying two different network diagrams and concepts from the book. Thus, the concept of rhizome, as a reading suggestion that provides opportunities for new discoveries at the city scale at the textual level, defines an "other" dimension for architecture.

Key Words: Rhizome; Metaphor; Other; City; Rhizomatic Reading.

INTRODUCTION

“Philosophy is the art of inventing, forming and fabricating concepts.”

Gilles Deleuze

The concept of “other” began to take shape with the influence of thought and human-based renaissance. Since new discoveries are outside the current views and rules of the modern world, they are not included in the modern system and they have been kept at a distance. For this reason, all kinds of events, phenomena and entities which are not accepted by the West are described as "other". Since architecture is a discipline that lives, develops and produces, especially with its social aspect, it can be exposed to the conceptual, contextual, political, artistic or technical effects produced by the approaches and events. For this reason, it is inevitable that a perception that "otherizes" will also affect architecture. As a concept with an unlimited extension of meaning, “other” can be considered in versatile and multi-layered manner in architecture in formal, theoretical, practical, constructional, technical, operational, visual, semantic, philosophical, textual and auditory terms.

The "rhizome" model, which does not accept the tree-based model that is a hierarchical and centrist system produced by the West, in the expression of knowledge, theory and actions, advocates not being centrist in the modern world, which describes everything that does not reinforce the central as the other. It gains the identity of "other" because it stays outside the boundaries and rules of the modern world.

Being one of the creators of the concept of rhizome, Deleuze associates his philosophy with concept creation whereas also emphasizes that "he is not interested in presenting reality to the readers". For Deleuze, thinking counts, and therefore his art and works are mainly about experimental studies. Being experimental has been associated with staying in the context of thinking differently and beyond than rethinking an issue or problem. Deleuze produces his concepts not as rigid assertions, but to think creatively about the world (Graham, 2017). At this point, rhizome comes to the fore as a concept produced to think creatively, express thought and understand relationships. The "rhizome", which Deleuze produced together with Guattari, which can express connections, overlaps, and vaguely existing networks, is the most important concept that shapes this work with its deep semantic content.

The research problem of this paper is to reveal a potential for the way the "Other" theme is handled in architecture. In this context, architecture was examined in a conceptual framework in parallel with the conceptual prominence of the "other" theme and the "other" aspect of architecture was opened to discussion. In this context, Deleuze's approaches, which equates concept inventing and producing with philosophizing, become significant. Because the theme of "Other", with its strong conceptual background, is based on Deleuze's thoughts, which bases on inventing concepts. This match of Deleuze philosophy and architecture itself turns into a “other” identity in this context.

The aim of the paper is to draw an architectural framework that considers the rhizome concept of Deleuze and Guattari, who express their thoughts by producing various concepts about the order of organizations and relations, as "other". For this purpose, the material of the paper is Oswald Mathias Ungers's book “Morphology City Metaphors”. With the examination, an example of other was created by choosing three of the six principles of the rhizome, and so, current discoveries and evaluations about the city and city order. Re-reading the formal city metaphors in the book with the concept of rhizome, which is described as "Other", has allowed the meaning of rhizome to be expanded through the metaphors in the book. Thus, it is aimed to make new possibilities visible instead of familiar perspectives on the city.

Other Architecture

'Other' is a concept produced by modernism that can be defined both by the chaotic situations created by the romantic and rational contradictions in the inner structure of modernism, and by ignoring what is outside of it. All kinds of architectural thoughts and practices that are separated, marginalized, distanced from or opposed can be called other architecture. The discriminatory attitude of the architectural practice in the Western geography towards the architecture in the Eastern geography or the distant attitude of the Eastern geography towards the African architecture may come to the fore as examples of other architecture.

Images that Bernard Rudofsky describes as "non-pedigreed architecture" and cannot be included in any class; represents the changing “other” potential in architecture. Rudofsky tried to bring together the floating villages of China, the amphitheater of Muyu-uray, the cave-dwelling and rural architecture of Egypt and Göreme under an architecture that has not yet been defined. The “architecture without architects” approach expressed in this context can constitute a contemporary example of other architecture (Balkanay, 2019).

Russerl (1979) defined vernacular architecture as “the industrialized vernacular”, which began to mechanize under the influence of modernism. The inclusion of mechanization and new materials in local architecture has led the local architecture to become “other” by marginalizing it. The tension between the local and the global has paved the way for the othering of architectural products. As a current example on this subject, it is not surprising that the comparison of local architecture and global architecture examples is included in the literature.

Associating the other and otherization with modernity, Tanyeli (1997) stated that the new identity construction brought by modernism is under the "other" effect. The traumatic exclusions in the geographies where otherization discourses are carried out have caused the post-modern identity construction in these geographies to be shaped far away from the traditions. Such a psychological state has led to the ignoring of all originalities and differences and the suppression of new differences and hybridizations that may arise. (Şoher, 2007).

Aga Han Architecture Awards can be mentioned as another case where other's impact of architecture with geography can be pointed out. According to Özkan; although this award is a platform where original and contemporary buildings and architects are rewarded, they are constantly faced with the problem of being marginalized under "Islamic Architecture". According to Tanju, the most important reason for othering is the insistence on architectural elements that should be temporary due to ignoring the holistic relationship. In such a case, Tanju states that instead of dividing the world into two poles, it is necessary to perceive the world as a set of parts that often establish unpredictable relationships with each other (Şoher, 2007).

When looking at other architecture on the scale of the city, the understanding of design under the influence of modernism has gained an identity as an action based on the general rules. In this context, cities demonstrate formations such as homogenous, uniform, symmetrical and axial. City approaches that are far from stratification and diversity are shaped by rules aimed at producing a universal common language and are stylistically similar to each other. Modernism, which formally rejects hierarchy, has divided the city into functional sections; It has integrated a hierarchy in which power and rationalism are sanctified in accordance with capitalism. According to Balkanay (2019), cities produced in the capitalist system help define “other” consciously or unconsciously. Since the city is shaped in line with the decisions of the administrators, inquiries and oppositional discourses and actions towards these decisions constitute the other.

In an occasion where the diversity of other architecture can be increased so much, instead of otherizing it, there may be more holistic approaches that see various networks and relationships within the existing architectural order and productions. At this point, “rhizome” should come to the fore as an approach that focuses on resistance instead of other.

Rhizome as "Other"

Deleuze and Guattari (1987: 6) define rhizome as following: “a rhizome as subterranean stem is absolutely different from roots and radicles. Bulbs and tubers are rhizomes. plants with roots and radicles may be rhizomorphic in other respects altogether”. The idea of the rhizome is a structural metaphor taken from the field of biological botany. It defines an underground mass of continuously growing horizontal stems or roots that periodically extend lateral shoots to grow and connect with other shoots.

There is no hierarchical structure for the growth of the rhizome. For example, it does not work the same way as an arborescent 'genealogy tree', where each point can only be connected along a solid, unidirectional, vertical line (Bluemink, 2015). Rhizome opposes the traditionalist approach of growing knowledge and other accumulated things in the form of trees, and that such growth is deemed necessary. New ideas and thoughts do not have to follow established traditionalist patterns (*Rhizomes,* 2021). Deleuze and Guattari (1987) explained the deficiencies in the form of the tree-based model by the fact that it can bud and rhizome as shown in Figure 1

(Kornberger, Rhodes, & Bos, 2017). In accordance with this resolved situation, they produced the concept of rhizome.

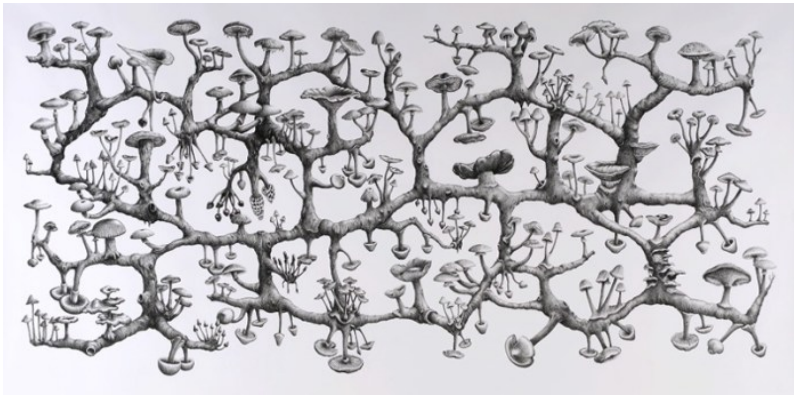


Figure 1. The rhizome structure (Bluemink, 2015)

In tree-based models that dominate life and condemn the individual to a solid, layered existence in order to interrupt the integrity; the concept of rhizome is referred to in order to produce deviations and aberrations (Kornberger, Rhodes, & Bos, 2017). Because the rhizome is about refusing to participate in ranking and classification rather than liberating or resisting. It is about the possibility that systems or orders may not have obligations such as functionality and productivity. Rhizome is an example of "other" in this context, as it does not accept the tree-based model adopted by the West, with its approach that supports the system goes beyond the traditionalist line.

The tree-based model is about imitations of everything in pre-given form, while the rhizome is against these imitations. It rejects rules, created segmentations, duplications, and pursues desires and potentials in minimized structuralism. At this point, the acceptance that history does not occur in the form of sequential events has caused the tree-based model, which is an example of a linear understanding of history, to lose its validity under today's conditions. In this context, the concept of rhizome, which deals with the developments in the historical process with intricate relations and possibilities instead of sequential and sequenced events; Emphasizes the processes in the realization of events, actions or situations and points out a production area in an endless state of being. For this reason, it can gain the quality of “other” as a topic of current experience and discussion, as it is contrary to the understandings that emphasize the order and system.

Aesthetically mapping and physical tracing of various roads and routes, which can be called Deleuzian lines of flight, is a process. In this process, pieces of information about large and small-scale mysteries are formed by traveling to cities, regions and geographical formations as a rhizomatic road narrative, and the information continues by being articulated in every journey. It creates multi-layered movements by connecting different contexts in the same geography and invents a new geography (Abel, 2017).

The rhizomatic mapping of a geography which may vary in areas such as literary, cultural, social, political etc.; is more than just a rejection of the tree-based model, which is more vertical, hierarchical, goal-centered (Abel, 2017). Because rhizomatic maps are narratives that exceed the content level and allow tobe on the road without restrictions.

A Rhizomatic Reading in Architecture: On the City, Metaphor and Concept

Rhizome in Architecture; instead of experiences and thoughts that categorize, standardize or systematically analogies on city and spatial scales; is about highlighting existing relationships and nuances. Within the scope of this paper, the relationship between architecture and rhizome is shaped as a textual exploration area where new searches are made. Rhizome as a contemporary concept handled at the architectural scale; can become "other" in a positive way by offering new perspectives, insights and approaches to the existing architectural accumulation.

According to Deleuze and Guattari, order, with the limitation of coordinating activities within established boundaries; strives to become a systemic universality as a system that would define goals, paths, lines, channels, organs, and an entire organ system. The missing relationship potentials of this effort are expressed with the understanding of emphasizing the new relatedness of the concept of rhizome. Even in the most familiar or strict arrangements it is possible to find rhizomes that express the creative potential for the exploration of new sites (Kornberger, Rhodes, & Bos, 2017).

In the book "A Thousand Plateaus", Gilles Deleuze and Felix Guattari (1987: 21) define rhizome as following: *"The rhizome is an a-centred system, non-hierarchical and non-signifying […] uniquely defined by a circulation of states". This book includes six principles defined as heterogeneity, multiplicity, a signifying rupture, cartography* and *decalcomania in order to better understand the rhizome connections* (Table 1). These principles are the way to something new; they include variations and expansions. It is a rejection of the understanding of the ruling classes and traditionalism in history. It is a constantly living and organic effort to release constrained forces. Rhizome may and should be used as a tool to question the structure of traditionalist systems, habits, explain various events, individuals and things in events (IAAC, 2021). For example, using the rhizome as a metaphor or concept to understand how the internet works and grows provides convenience (Parsons & Clarke, 2013). In this context, rhizome can be handled by using its principles as a tool to understand and examine the city.

Table 1. Principles and meanings of rhizome

principles	meanings
connection	a rhizome ceaselessly establishes connections
heterogeneity	any point of a rhizome can be connected to any other and must be
multiplicity	a multiplicity is, in the most basic sense, a complex structure that does not reference a prior unity
asignifying rupture	ıf you break a rhizome it can start growing again on its old line or on a new line, connections are constantly breaking (deterritorialisation) and reforming (reterritorialisation)
cartography and decalcomania	the rhizome is like a map and not a tracing

A brief introduction to the definitions of the principles;

connection: A rhizome has multiple points of entry; a rhizome also has no beginning and no end. A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relevant to the arts, sciences and social struggles (Deleuze & Guattari 1987: 7). It feed each other by the principle of heterogeneity.

heterogeneity: Rhizome can connect with any heterogeneity at any point (IAAC, 2021). It joins by connecting multiple points together, these junctions develop and change in size; as it is, it can come together again with different points. In the arrangement in the heterogeneous rhizomatic model, which consists of participants that are not similar and not in a standard structure, both the participants and the arrangement gain new dimensions with the diversity that is not subject to restrictions (Karamanlı, 2020).

multiplicity: There are no predetermined points or locations in the rhizome, there is a multiplicity of lines forming nodes that arise randomly at random intersections (Mackness, 2014). Multitude refers to a structure that does not increase quantitatively, but whose determinations, dimensions and magnitudes can change. “Rhizome, is not a multiple, derived from the one, or to which one is added. it is composed not of units but of dimensions, or rether directions in motion. It has neither beginning nor end, but always a middle from which it grows and which it overpills” (Deleuze & Guattari, 1987: 21).

***asignifying rupture*:** If the rhizome is broken at any point, it continues to grow in the old line or the new line and can correct itself at any point. When the rhizome is severely ruptured, its final state is not considered less rhizomatic than its former state, because tearing a part of the complex cannot destroy the entire complex. Rupture refers to moving away from current environment and habits in order to reach new quests by following the escape lines in the rhizome, which is enriched with the diversity in arrangements and the created flexible approaches (Karamanlı, 2020).

cartography and decalcomania: The principles of cartography and decalcomania are often discussed together. Cartography enables the creation of many orientations and axes of navigation and incorporation into the rhizome with multiple entrances and exits, thus opening the rhizome to

communication and strengthening connectivity. Whereas decalcomania progresses by producing different meanings with its structure that allows endless repetition and is open to correction and change in every repetition. Cartography is a strategy for navigating a rhizomatic structure, emphasizing the performative aspect of the rhizome. Mapping is a creative rather than a repetitive production because maps are intended for experimental contact with real life. Despite this creative aspect of mapping and mapping, tracing attempts to follow a particular path from start to finish (Parsons & Clarke, 2013).

Rhizome principles are not with clear and distinct segregations (Figure 2). They express perspectives on a structure based on form, scale, or experience. At this point, the scope of rhizome principles is organicism which can expand and contract according to the views produced in order to evaluate a structure.

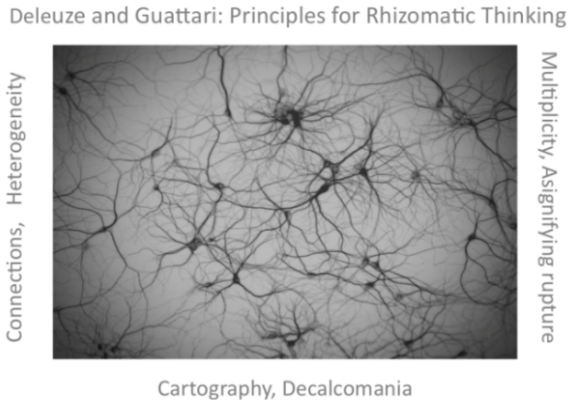


Figure 2. Rhizome Principles (Mackness, 2014).

When the city, as a living organism, is evaluated from a rhizomatic point of view, metaphors produced by Deleuze and Guattari for their multidimensional perspectives on the city come to mind. The metaphor of *The Body without Organs* in the book “A Thousand Plateaus” is used effectively to express the user and administrator relations of a city. In addition, another metaphor that Deleuze and Guattari refer to in order to clarify the city and its processes is Bataille's labyrinth metaphor (graffland, 1999). Making use of metaphors to express the city is a different aspect of the rhizome.

Expressing cities with metaphors is an example of a semantic and formal match. Metaphor is preferred in various disciplines, including architecture, as a type of expression that encourages different connotations in the mind and perception. Within the scope of this paper, the metaphor is discussed at the city scale as predicted by the research material. The fact that the book “Morphologie City Metaphors” has a content that produces visual metaphors for the city order, system and forms of organization; encourages the reader to rethink the relationality offered by textual and visual representation.

At this very point, it can be said that rhizome is a new perspective that serves to reveal existing relationships as a metaphor taken from the discipline of biology. In this context, the book "Morphologie City Metaphors" was re-read with the concept of "rhizome", which aims to produce new relationships and potentials, and a rhizomatic reading proposal for the city was constructed. In rhizomatic reading, a path was created in which the principles of rhizome were followed. With the rhizomatic reading made in line with this theme, new questionings were made towards the discovery of existing potentials in architecture.

Rhizomatic reading was performed by selecting three of the six rhizome principles. Among the six rhizome principles determined by Deleuze and Guattari, the principles of connection, heterogeneity and multiplicity, which are suitable for evaluation through the formal visuals of the city, were selected. The steps of the rhizomatic reading created with the determined principles are as shown in Figure 3.

- City form-metaphor pairings in the book are handled with concepts expressing this pairing, and city form-concept, metaphor-concept schemes are created.
- The city forms in the book are evaluated in accordance with the three principles of the rhizome listed below.

  Connection: It is important that the system contains networks that can be opened to the outside. Forms that are closed in a systematic order are insufficient for the principle of connection.

  Heterogeneity: It is unlikely to be found in disciplined and hierarchical situations. It is searching for the unequal and unsymmetrical in relationships and networks.

  Multiplicity: It is not to become crowded in quantity, but to multiply, develop and gain new dimensions qualitatively. It is important that the current regulation does not remain closed within its borders, and that it also offers opportunities for external connections in many different dimensions.

- The metaphors and concepts corresponding to the city forms determined in accordance with the rhizome principles.
- Potential relationship networks are created in the city forms scheme and metaphors scheme in accordance with the rhizome.
- A rhizomatic map is created by overlaying networks and concepts from two separate schemes.

Figure 3. Rhizomatic reading steps

Rhizomatic reading, starting with the awareness that there may be hidden and tacit relations, reveals the relations of the potentials that stand out within the scope of the research, in accordance with the purpose of the paper and the rhizome.

Morphologie City Metaphors as a Rhizomatic Reading

As a metaphor, rhizome makes it possible to make an city reading with the definition of "*The recognition of the multiplicitous connections that a rhizomatic reading of the city affords* (Daskalaki & Mold, 2013)". The first edition of Oswald Mathias Ungers's "Morphologie City Metaphors", selected within the scope of the paper, was made in Istanbul in 2013. An approach to designing and thinking with images, metaphors and analogies is

explained in the book. The city images selected in this framework were not analyzed according to measurable functions or criteria, instead they were interpreted at a conceptual level with ideas, images, metaphors and analogies.

There are 57 city images and corresponding metaphors in the book. In addition, there is a common concept expressing each city form-metaphor pair. For example, the concept of “focus” in the book explains both a city plan and its metaphorical counterpart, the visual. In this scope, there are 57 concepts, 57 city forms that meet these concepts, and 57 metaphors in the book.

The city, metaphor and concept trilogy; provides a suitable opening to the rhizome, as it is a union that contains different connections, relationships and potentials. In the paper carried out to question the immanent potentials, a conceptual search and discovery for the city can also be mentioned.

The three rhizome principles that make up the rhizomatic reading are related to each other in accordance with the structure of the rhizome. A change in any of the principles affects the others, defining networks and connections (Figure 4). The areas shaded in dark gray below indicate that there are many situations that remain hidden and implicit within the principles. These principles, which reflect the structure of the rhizome, can themselves form part of a rhizomatic structure.

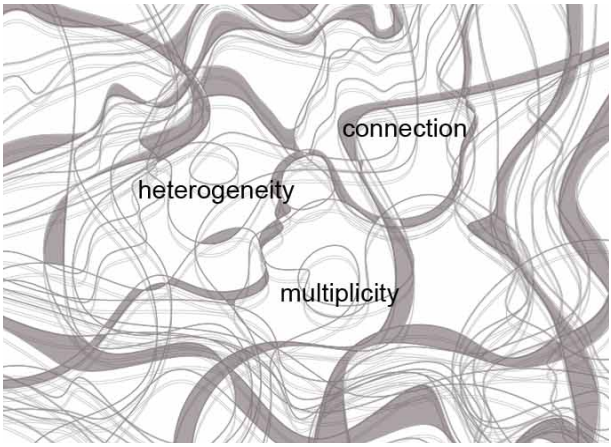


Figure 4. Rhizome principles scheme in rhizomatic reading

According to the rhizomatic reading steps created with these principles, 57 concepts, city forms and metaphors in the Morphologie City Metaphors book were arranged side by side in order of page numbers and schematized. City forms and concept matching are as shown in Figure 5 whereas metaphor and concept matching are as shown in Figure 6.

radiation	connection	defense	opening	doubling	conglomeration	notch
protection	focus	parallelism	regularity	intersection	organism	repetition
shielding	articulation	additions	branching	strangulation	spine	annexes
dependency	confinement	unfoldment	expansion	similarity	network	rotation
uniformity	encounter	cell structure	tissue	enclosure	alternation	multiplication
circulation	confusion	minification	ramification	expansion	emission	abloom
crystallization	labyrinth	encirclement	scattering	alignment	linearity	storing
stratification	planetary system	nesting	grid	mass	growth	spreading	densification

Figure 5. Matching city forms and concepts in Morphologie City Metaphors

radiation	connection	defense	opening	doubling	conglomeration	notch
protection	focus	parallelism	regularity	intersection	organism	repetition
shielding	articulation	additions	branching	strangulation	spine	annexes
dependency	confinement	unfoldment	expansion	similarity	network	rotation
uniformity	encounter	cell structure	tissue	enclosure	alternation	multiplication
circulation	confusion	minification	ramification	expansion	emission	abloom
crystallization	labyrinth	encirclement	scattering	alignment	linearity	storing
stratification	planetary system	nesting	grid	mass	growth	spreading	densification

Figure 6. Matching metaphors and concepts in Morphologie City Metaphors

The relationship potentials of city forms may be less or more intense than each other. In order to determine the status of these relations, city forms are marked in different colors according to the rhizome principles in the rhizomatic reading steps, as shown in Figure 7. The principle of connection is shown with a red frame, the principle of heterogeneity with a green frame, and the principle of multiplicity with a purple frame. Compliance and validity with rhizome principles were determined by following roads and other connecting axes in city forms. Because all kinds of axes that connect are important for the reading, as they form the network of relations that connects the system in city forms.

In this context, the first step of reading was carried out by marking the images that are valid and suitable for the rhizome principle on the upper side of Figure 7. At the bottom, the corresponding metaphors of the city forms marked in accordance with the principles are given. The metaphorical counterpart of the city form, which has not been marked, has been eliminated and not included in the diagram.

Rhizomatic traces can be seen among all city forms, as city forms are open to making unusual connections according to rhizome principles. Since city forms are existing systems, a rhizomatic network has been created without any elimination. However, the metaphors that match the forms have been identified by the author of the book and may vary from person to person. For this reason, the metaphors corresponding to the forms that do not comply with the rhizome principles were eliminated and a rhizomatic network of metaphors was formed. In Figure 8, the potential relationships of city forms are shown at the top, and the potential relationships of metaphors at the bottom. The red network in the figure was produced by following the traces, paths, connections, flows in the formats. It is possible to talk about the networks as exploratory movements on the traces and axes of the form. Networks are also maps of aesthetic experience built on roads and routes. The green networks in the metaphors scheme was created by following the borders and prominent lines of forms such as the red network. It should be reminded again that since these lines are discoveries, they are open to be reproduced, expanded or ignored.

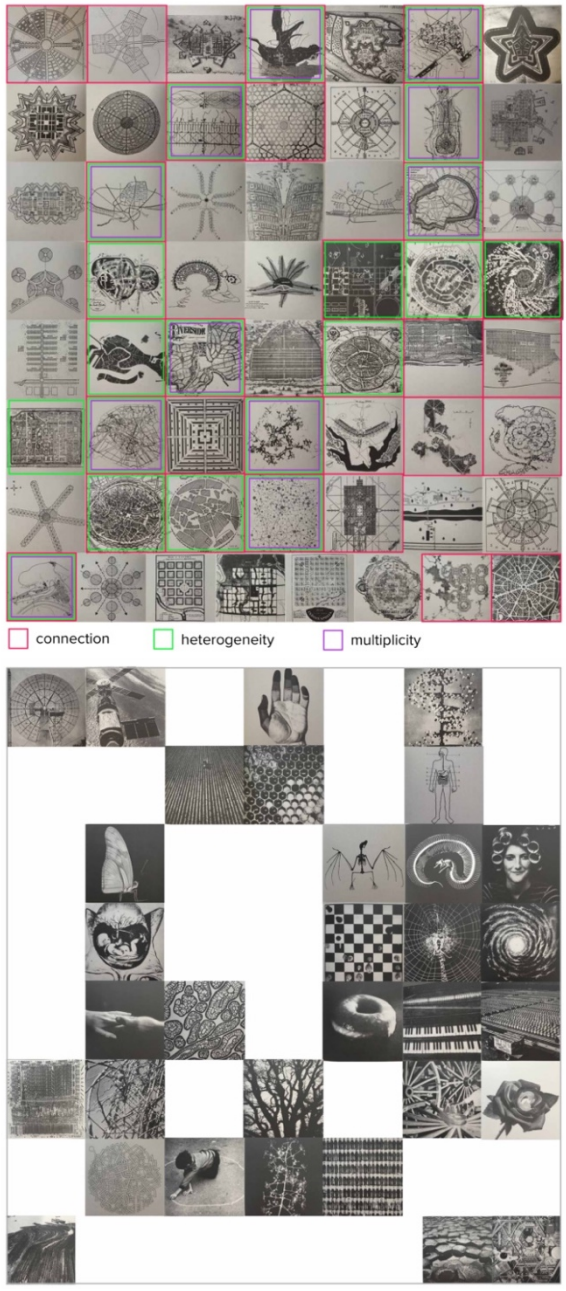


Figure 7. Rhizomatic city forms and their corresponding metaphors

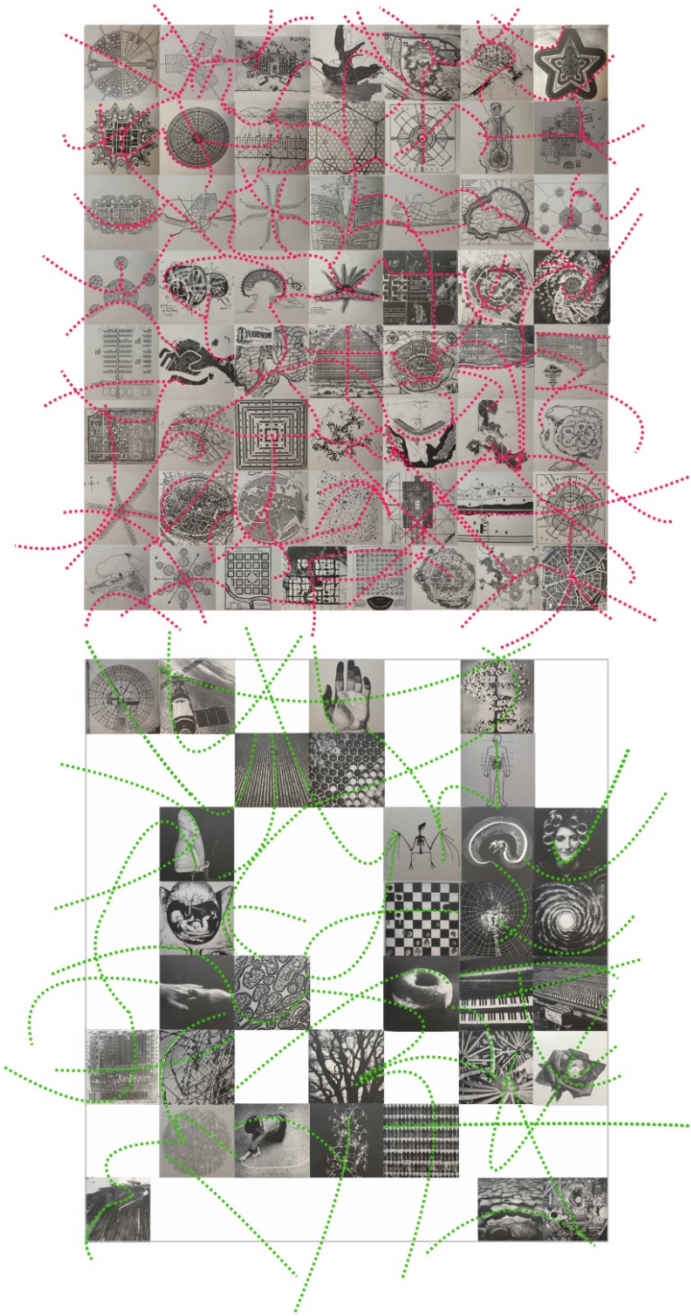


Figure 8. Rhizomatic networks of city forms and rhizomatic networks of metaphors

The result of the rhizomatic reading performed within the scope of the paper is as shown in Figure 9. Rhizomatic networks of city forms and rhizomatic networks of metaphors taken from Figure 8 on the grid-base of the concepts are overlapped. The green network of metaphors suitable for rhizome is placed on the red network of forms. The new bicolor network is complemented by the addition of concepts of rhizomatic metaphors. The concepts are positioned on the metaphor image they are related to.

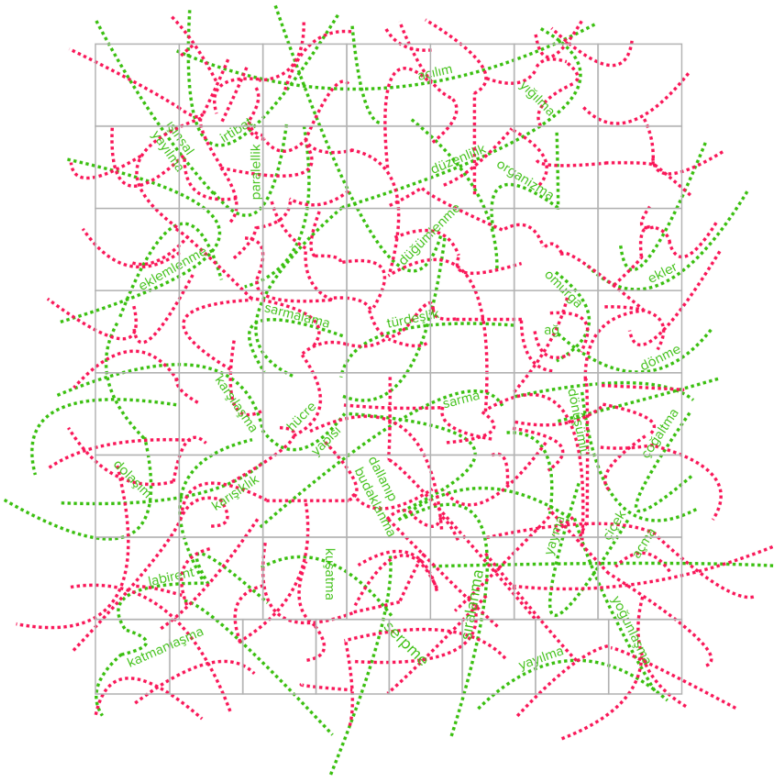


Figure 9. “Morphologie City Metaphors” rhizomatic map

The map obtained from the re-reading on city forms and matched metaphors in “Morphologie City Metaphors”; is about city forms, rhizomatic metaphors and concepts. With the rhizomatic network map, the semantic and existential diversity in the book has been brought forward with another form of representation.

In regions and geographies at the city scale, in objects and beings on the metaphor scale, the rhizomatic map as an exploratory journey into the mysteries of large and small scales; creates knowledge of mysteries of different scales, and this knowledge increases by layering with each trip. Thus, it can be said that the potential relationships in the rhizomatic map are a multi-layered invention of the knowledge and meaning of city form and

metaphors. The rhizomatic map obtained as a result of this paper (Figure 9); proposed new relationships that connect the triad of city, metaphor and concept, which is available in the book as an existing relation, in a new and different way. In this context, it should be said that the proposed rhizomatic reading, results and relationships revealed are potential searching, and are open to development.

CONCLUSION

In this paper, it is aimed to bring the concept of rhizome, whose conceptual framework was created with reference from Deleuze and Guattari, to the agenda as an example of "other". Based on the meaning and content of the rhizome, the rhizomatic reading focused on ambiguity, discovery of new ways of thinking, and revealing hidden potentials.

In the reading created by using rhizome principles, the book "Morphologie City Metaphors" was examined. With the map created as a result of reading, new relationships were produced, various connections were established, thus it was tried to reveal the implicit and hidden. Because mapping is the most important strategy for exploring a rhizomatic structure. Map is a creative act, oriented towards experiential contacts and pursuits. Created for this very reason, reading is another suggestion for the potential to establish new relationships in the example of a book. The conclusions reached in the paper care about different potentials rather than strict and clear boundaries. In this scope, the paper can be seen as a rhizomatic step to enable new evaluations and developments, and to create an opportunity for the establishment of various relationships.

In conclusion, in the example of "Morphologie City Metaphors", a current re-reading based on rhizome was made and a new perspective was presented in order to think about architecture. Rhizomatic reading expresses through texts, visuals and concepts that the city is a multifaceted and multi-connected narrative space characterized by relationships established in various and different contexts. In this context, the rhizome should gain an “OTHER” identity as a tool or purpose and become one of the current discussion areas of architecture.

REFERENCES

Abel, M. (2017). Rizom’da Hareketlilik: Gilles Deleuze ve Jack Kerouac’ın “Yolda” Karşılaşmaları Üzerine. İstanbul, Turkey: SUB Yayınları.

Balkanay, E. (2019). Mimarsız Mimarlık: Enformel Retrospektiften Kentsel Muhalefete. XXI Journal. Retrieved from: https://xxi.com.tr/i/mimarsiz-mimarlik-enformel-retrospektiften-kentsel-muhalefete

Bluemink, M. (2015). The Web as Rhizome in Deleue and Guattari. Retrieved from: https://bluelabyrinths.com/2015/07/15/the-web-as-rhizome-in-deleuze-and-guattari/

Daskalaki, M., & Mould, O. (2012). Beyond Urban Subcultures: Urban Subversions as Rhizomatic Social Formations. International Journal of Urban and Regional Research, 37(1), 1–18.

Deleuze, G. & Guattari, F. (1987). A Thousand Plateaus, Capitalism and Schizophrenia. London, England: University of Minnesota Press.

Graflaand, A. (1999). Of Rhizomes, Trees, and the IJ-Oevers, Amsterdam. Assemblage (no.38, pp.28-41): The MIT Press.

Graham, B. (2017). Deleuze ve Burroughs Organsız Beatler: Çıplak Şölen'in Formülleri. İstanbul, Turkey: SUB Yayınları.

IAAC (2021). Institute for Advanced Architecture of Catalonia. Retrieved from: http://www.iaacblog.com/programs/rhizome-2/

Karamanlı, B. (2020). Roberto Bolaño'nun 2666 Adli Romaninda Rizomatik (Köksapsal) Yapi İncelemesi. İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, Bati Dilleri Ve Edebiyatlari Anabilim Dali, İspanyol Dili Ve Edebiyati Bilim Dali, İstanbul.

Kornberger, M., Rhodes, C., & Bos, R. T. (2017). Sıradüzenin Ötekileri: Örgütlenmenin Rizomatiği. İstanbul, Turkey: SUB Yayınları.

Mackness, J. (2014). Principles for Rhizomatic Thinking. Retrieved from: https://jennymackness.wordpress.com/2014/06/24/principles-for-rhizomatic-thinking/

Parsons, J. & Clarke, B. (2013). Rhizomic Thinking: Towards a New Consideration of Social Studies Practice. Social Studies Research and Practice, 8(3), 89-98.

Rhizomes,(2021). Retrieved from: http://www.rhizomes.net/files/manifesto.html

Russell, B. (1979). The Vernacular,The Industrialised Vernacular And Other Convenient Myths. M.E.T.U. Journal of the Faculty of Architecture, 5(1), 101-107

Şoher, Ş. (2007). Öteki Mimarlık. Retrieved from: https://v3.arkitera.com/h16413-oteki-mimarlik.html

Tanyeli, U. (1997). Modern Mimarlık. In Rona, Z., Beykan, M. (Ed.). Eczacıbaşı Sanat Ansiklopedisi, 2(pp.1286-1289). İstanbul: Yapı Endüstri Merkezi Yayınları.

KTU
1955

KARADENİZ
TECHNICAL UNIVERSITY
FACULTY OF ARCHITECTURE
DEPARTMENT OF ARCHITECTURE

F.ARCH