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Editorial

The Journal of Design, Planning and Aesthetics Research (**DepArch**) has just published its Volume 1, Issue 2, with the joy, excitement and enthusiasm of an interdisciplinary effort with a very valuable team with editorial experience in various journals, in line with the specific objectives of contributing to scientific academic world. As editors, we are pleased to present the second issue of **DepArch**, a new free peer-reviewed, open-access, international e-journal of architecture, primarily concerned with design, planning and aesthetic research. We would like to thank all those who have contributed to the second issue of the Journal, with the aim of exploring and bridging the relationship between architecture, planning and aesthetics and other disciplines that influence or are affected by them.

Architecture surrounds us everywhere; however, it is more than just a building. It is a philosophy of life that touches every part of the built environment and its citizens. This edition aims to expand the meaning of architecture by rethinking the connections between boundaries and culture, style and creativity, experience and narrative, identity and phenomenology of space, synthesis of art and architecture, and material of interior design and wood determination.

The content of the issue begins with a methodological expression, participatory design, which draws attention to the active role of citizens in the design environment, written by Emeritus Professor **Henry Sanoff**. 'The Participatory Design' article helps to raise the voice of the citizens/users of the place during the design process to achieve successful outcomes for the communities. It is a great honour to have Sanoff's words at the beginning of the DepArch's journey. Emeritus Prof **Chiu-Shui Chan** identifies design cognition to improve the level of creativity and style of design by revealing the distinction between thinking and cognition in the essay 'Cognitive Phenomena of Style and Creativity'. I would like to give special thanks to dear Professor Chiu-Shui Chan for drawing a sketch for improving our style and creativity in design.

Davies and Hanks emphasise that the nature of architecture becomes richer through decay and adaptation. The strongly visually written article also supports the theory of the study with examples from Great Britain. The approach, designing for narrativity, with a selected site from Nottingham called County House is presented in the article 'Embodied Time: Applied and Incidental Architectural Narratives'. The following article, 'Genius Logi: Towards the Phenomenology of Gated Community', written by **Yıldız** and **Alkan Bala**, addresses the concept of place and gated communities from architecture to urbanism by providing a detailed analysis in Aydin, Türkiye. **Ozyıldıran** examines a significant example, the Turkish Grain Board (TMO) General Directorate building in Ankara, Turkey, to extend the synthesis of art and architecture in literature. This study, 'Works of Art in the Turkish Grain Board (TMO) General Directorate Building', also highlights the influence of sculpture, mosaic and ceramics on 1960s architecture. The last article in this issue, entitled 'Formaldehyde Emission in Different Positions of Wood-Based Panels Used in Interior Design', was written by **Yıldırım**, **Çınar** and **Erdem** and analyses wood-based panels, one of the most important materials for interior design, and their positions under different emission levels by testing their reliability.

As Editor-in-Chief of DepArch, I would like to express my deepest gratitude to all authors and reviewers for their support to the journal. I hope the beauty of your life remains with you. Enjoy the current issue and look out for the next issue in spring 2023.

My Warmest Regards

Assoc. Prof. Dr. Ebru Erdoğan

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CONTENTS

Participatory Design

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Abstract

Participatory design is the involvement of people in the creation and management of their built and natural environments. Its strengths are that it cuts across traditional professional boundaries and cultures. The activity of participatory design is based on the principle that the built and natural environments work better if citizens are active and involved in its creation and management instead of being treated as passive consumers. The main purposes of participation are to involve citizens in planning and design decision-making processes and, as a result increase their trust and confidence in organizations, making it more likely that they will work within established systems when seeking solutions to problems; to provide citizens with a voice in planning, design and decision-making in order to improve plans, decisions, service delivery, and overall quality of the environment; and to promote a sense of community by bringing people together who share common goals. A wide range of techniques is available to designers. Some of these techniques have become a standard method used in participatory processes, such as interactive group decision-making techniques that take place in workshops. At the same time, designers have effectively used field techniques such as questionnaires, interviewing, focus groups and group mapping to acquire information. In general, many of the techniques facilitate citizen's awareness to environmental situations, and help activate their creative thinking. The techniques can be classified as awareness methods, group interaction methods, and indirect methods.

Keywords: Democracy, Decision-making, Conflict Resolution, Citizen Participation, Evaluation.

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PARTICIPATORY DESIGN

Participatory design is an attitude about a force for change in the creation and management of environments for people. Its strength lies in being a movement that cuts across traditional professional boundaries and cultures. Its roots lie in the ideals of a participatory democracy where collective decision-making is highly decentralized throughout all sectors of society, so that all individuals learn participatory skills and can effectively participate in various ways in the making of all decisions that affect them. Increasingly complex decision-making processes require a more informed citizenry that has considered the evidence on the issue, discussed potential decision options and arrived at a mutually agreed upon decision (Abelson et al., 2003).

Today participatory design processes are being applied to urban design, planning, geography as well as to the fields of industrial and information technology. Research findings suggest that positive outcomes are associated with solutions being informed by users' tacit knowledge (Spinuzzi, 2005). More recently, another factor has been suggested as being partly responsible for favorable participatory design outcomes, which is described as collective intelligence (Fischer et al., 2005). Atlee (2003) describes collective intelligence (CI) as a shared insight that comes about through the process of group interaction, particularly where the outcome is more insightful and powerful than the sum of individual perspectives. When people align their individual intelligences in shared undertakings, instead of using their intelligence to undermine each other in pursuit of individual status, they are able to generate collective intelligence. Collective intelligence has been suggested as being partly responsible for favorable participatory design outcomes (Fischer et al., 2005).

Public participation builds on classic democratic theory: that those citizens who are affected by decisions should have a say in decisions that affect their lives because they will become better citizens. Participation is effective when, the task is conceptualized in terms of what is to be accomplished when the need is acknowledged to involve citizens. And it is often the physical and environmental projects that citizens see directly affecting their lives. To create a condition in which people can act on their own environmental needs, in which they can make the distinction between the experts technical and aesthetic judgment, requires a change in the consciousness of both people and professionals.

Citizen participation in community decision-making can be traced as far back as Plato's Republic (Plato and Grube, 1992). Plato's concepts of freedom of speech, assembly, and voting, and equal representation have evolved through the years to form the basis upon which the United States was established. Some historians support the notion that Americans have always wanted to be part of decisions affecting their lives. Billington (1974) contends that freedom and the right to make decisions on the early American frontier was the shaping force in grass roots democracy, i.e., people's right to participate. As many frontier villages grew in population it became increasingly difficult for every citizen to actively participate in all community decisions. To fill the void in the decision making process, people began to delegate their involvement to a representative, which grew into the system of selecting officials by public elections, and the increase of volunteer associations and organizations (de Tocqueville 1959). Although public participation can be approached and defined in many different ways, this discussion is concerned with participation aimed at issues involving community decision-making.

Colfer et al. (1999) argue for the importance of local people in involvement, decision-making, and sustainable management. The debate about balancing local with national interests, particularly in the case of public lands, is a discussion about power and is in many situations the central theme in sustainability. Although social norms vary in different cultures, a participatory approach helps people understand the complex interweaving of environmental factors, and provide insights into situations so familiar that their characteristics are not perceived. The form of participation is important, because it requires careful consideration of communication behaviors throughout the process to bring about knowledge sharing and learning by all participants (White, Nair and Ashcroft, 1994).

Community participation is commonly associated with the idea of involving local people in social development. The most important influences come from the Third World community development movement of the 1950s and 1960s, western social work, and community radicalism (Midgley, 1986). The plans of many developing countries emphasized cooperative and communitarian forms of social and economic organization, stressing the values of self-help and self-sufficiency (Worsley, 1967), advocating that the poor and the oppressed should be mobilized to promote social and economic progress. Current community participation theory suggests that politicians and bureaucrats have exploited ordinary people and that they have been excluded from the community development process. Its leading proponents are found in international agencies such as the United Nations, the World Health Organization and UNICEF. The emergence of community participation theory as an approach to social development is an outgrowth of the United Nations' popular participation program that required the creation of opportunities for all people to be politically involved and share in the development process.

DEMOCRACY AND PARTICIPATION

Many authors describing concepts of participation point to connections between theories of democracy and theories of participation in design and planning (Fagence, 1977). Democratic theory has always stressed citizen participation in public decision-making. With few exceptions, however, democratic theory has traditionally encouraged "low quality citizen action by making a fetish out of only one form of political participation - voting" (Pranger, 196, p. 30). In reality, democracy was perceived as a procedure for electing government leaders.

Despite the insistence on "citizen rule" in the ideology of democracy, large segments of the population in all modern nations are in reality powerless to significantly affect the political decisions, policies, and actions of their societies. The concept of participatory democracy, which emerged in the 1960's, was a rediscovery of traditional democratic philosophy (Olsen, 1982).

The roots of the participatory process can be found in the classical writings of Jean Jacques Rousseau and Robert Stuart Mill. Rousseau's ideal political system is designed to develop responsible individual and social action through the effect of the participatory process. Rousseau believed that participation performs a vital educational effect, teaching people to be informed, interested and involved citizens who have a sense of control over their lives and concern for the broader community (Pateman, 1970).

The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government. The deliberative turn represents a renewed concern with the authenticity of democracy, which is engaged in by competent citizens (Dryzek, 2000). To increase the effectiveness of our democracy, Atlee (2003) advances

the idea of Citizen Deliberative Councils (CDC), which are small face-to-face groups of diverse citizens that convene for short periods of time to consider some public concern. Deliberation, states Atlee, is a form of dialogue with the intention of producing decisions, policies, recommendations or collective action. Deliberation involves a careful consideration of an issue, examining the facts, viewpoints and consequences related to it. Unlike an open participatory forum, a CDC is an organized group of people selected such that their collective diversity reflects the diversity of the larger population from which they were drawn. Unlike public hearings, which are often aimed at airing views, citizen deliberative councils are small, usually between ten to fifty people, and generate a specific product such as a recommendation, which would generate further community dialogue. Specific methods using a deliberative approach include citizens' juries, planning cells, deliberative polling, consensus conferences and citizens' panels. Individual methods may differ with respect to participant selection, the number of participants the type of input obtained or the number of meetings. Common to all, however, is the deliberative component where participants are provided with information about the issue being considered, encouraged to discuss and challenge the information and consider each other's views before making a final decision or recommendation for action (Abelson et al., 2003).

Recently, many public figures have made references to democratic participation with words like community and citizenship and endorsed concepts like community building. New organizations such as the International Association for Public Participation and the Civic Practices Network have identified communities and examples of cutting edge practices in community participation. Yet at times participation has been distorted to mean that everything has to be checked with everyone before any decision is made. Juan Diaz Bordenave (1994) describes this as a disease called participationitis. Participation has also come to mean attendance at ongoing public hearings and constant meetings or donating money to a popular campaign.

Mill (2001) argues that participation in national government is only effective if the individual has been prepared for participation at the local level. It is at this level that people learn self-governance. The reemergence of the ideal of a participatory democracy awakened in many people a concern for public issues outside their own immediate lives.

Westergaard (1986) viewed participation as collective efforts of those citizens traditionally excluded from control to increase their ability to manage resources and institutions. Brager, Specht, and Torczyner (1987) defined participation as a means to educate citizens and to increase their competence. It is a vehicle for influencing decisions that affect the lives of citizens and an avenue for transferring political power. The World Bank's Learning Group on Participatory Development (1994) defines participation as a process whereby stakeholders influence and share control over development decisions and resources which affect them.

All the central features and principles of a participatory democracy can be combined into the following definition: In a participatory democracy, collective decision making is highly decentralized throughout all sectors of society, so that all individuals learn participatory skills and can effectively participate in various ways in the making of all decisions that affect them. Particularly crucial in this conception of participatory democracy is the insistence that full democratization of decision-making within all local and private organizations is a necessary prerequisite for political democracy at the national level.

Building a participatory democracy also means building an increased sense of community among the population at large. When people have a strong sense of community, they are more likely to respond positively to efforts to solve community problems, and will be willing to contribute their time and resources to meeting community needs (Morris, 1996). The process is a stabilizing rather than a destabilizing force. Increased participation efforts do bring in more people who initially have a lower sense of community than is typical for those who are politically involved. But these efforts also develop the participants' sense of community for as long as they remain involved (Thomson et al., 1994). Planners and architects facilitating a collaborative design process is described as "co-design" by King (1983), with such benefits as creating events that allow for social interaction and developing a sense of community through face-to-face interactions, and publicly affirming community values.

Because participatory design (PD) practitioners are so diverse in their perspectives, backgrounds, and areas of concern, there can be no single definition of PD. However, PD practitioners share the view that every participant in a PD project is an expert in what they do, whose voice needs to be heard; that design ideas arise in collaboration with participants from diverse backgrounds; that PD practitioners prefer to spend time with users in their environment rather than ''test'' them in laboratories. Participatory design professionals share the position that group participation in decision-making is the most obvious. They stress the importance of individual and group empowerment. Participation is not only for the purposes of achieving agreement. It is also to engage people in meaningful and purposive adaptation and change to their daily environment.

Similarly, the unique qualities of places where planning and development occur can play a critical role in the process as well (Manzo, 2006). Citizens' attachment to places in their community can help to inspire action because people are motivated to protect and improve places that are meaningful to them. Sense of community has been linked to place attachment at the individual and community scale. Rivlin's (1987) study of a Brooklyn neighbourhood found that attachment to the neighbourhood served as a precondition for the development of a sense of community among neighbours. Both sense of community and place attachment are linked to participation, consequently sense of community has become a key planning goal (Morris, 1996; Perkins, Brown and Taylor, 1996). Other studies in participation conducted during the past decade have referred to such benefits as citizen empowerment, increasing social capital and promoting a sense of community (Guy, 2002).

Advocates of participatory action research (PAR) distinguish between research for the people and research by the people, where participatory methods have had parallel developments in such fields as public health, resource management, adult education, rural development, and anthropology. Research is seen not only as a process of creating knowledge, but simultaneously, as education and development of consciousness, and of mobilization for action. Action research can be described as a family of research methodologies, which pursue change and understanding at the same time. It is thus an emergent process, which takes shape as understanding increases.

The effectiveness of community organizations, social relationships and mutual trust is referred to as social capital. It is a measure of the social networks in a community with such indicators as civic education, community leadership, volunteerism, community pride, government performance, and capacity for cooperation (Bens, 1994). Therefore, social capital, along with place attachment can be perceived of as community assets that can be created

through community participation (Kretzmann and McKnight, 1993). A community organizing approach described as Asset Based Community Development (ABCD) sees citizens as assets and as co-creators of their community. Citizens discover, map and mobilize the assets that are within the people in the community, as well as informal associations and formal organizations. Active community participation is key to building an empowered community. Empowerment is where people, organizations and communities have control over their affairs (Rapoport, 1987). Communities seeking to empower themselves can build active citizen participation by welcoming it, creating valuable roles for each person to play, actively reaching out to build inclusive participation, and creating and supporting meaningful volunteer opportunities. Studies of empowerment demonstrate that such power is achieved on the strength of interpersonal relationships among those working towards a common goal (Perkins, 1995). Shiffman states that, "community development is not simply rebuilding…it is… about social and economic justice" (PICCED, 2000). Speer and Hughey (1995) claim that shared values and strong emotional ties are more effective bonding mechanisms than reactions to community issues alone.

DIFFERENT PERSPECTIVES

In an alliance called Computer Professionals for Social Responsibility (CPSR) participatory design is described as an approach to the assessment, design, and development of technological and organizational systems that place a premium on the active involvement of workplace practitioners in design and decision making processes. CPSR advocates co-designing new opportunities for exercising creativity; increasing worker control over work content, measurement and reporting; and helping workers communicate and organize across hierarchical lines within the organization and with peers elsewhere. They recognize that workers are a prime source of innovation, that design ideas arise in collaboration with participants from diverse backgrounds, and that technology is but one option in addressing emergent problems (Sanoff, 2007).

The Participatory Geographies Working Group (PyGyWG) reflects a surge of interest in the study and application of participatory research methods such that geographic research should have benefits for those affected by the social, economic and environmental issues, which are at its heart. A range of participatory principles underpins participatory geographies, such as a focus on empowerment and collective action where participants learn from their engagement in the process. They believe that participatory work should be proactively inclusive with practitioners actively attempting to include and seek out people who are often ignored or do not take part in community development or research processes. Participatory geographers, therefore, often seek to work in bottom-up ways with the goal of actively engaging and benefiting groups outside academia so that traditional barriers between 'expert researcher' and 'researched community' are broken down (PyGyWg, 2006).

Advocates of participatory action research (PAR) distinguish between research for the people and research by the people, where participatory methods have had parallel developments in such fields as public health, resource management, adult education, rural development, and anthropology. Research is seen not only as a process of creating knowledge, but simultaneously as education and development of consciousness, and of mobilization for action. Action research can be described as a family of research methodologies, which pursue change and understanding at the same time. It is thus an emergent process, which takes shape as understanding increases, where the subject of the research originates in the community itself and the problem is defined, analysed and solved in the community (Taylor, 2004).

Particularly crucial in the conception of participatory design is the idea of democratization of decision-making within all local and private organizations as a necessary prerequisite for political democracy at the national level. Colfer et al. (1999) argue for the importance of local people in involvement, decision-making, and sustainable management. The debate about balancing local with national interests, particularly in the case of public lands, is a discussion about power and is in many situations the central theme in sustainability.

SOCIAL SUSTAINABILITY

In recent years, participation in interactive governance and public involvement in the planning of development projects have been regarded as fundamental elements of social sustainability and the delivery of sustainable development policies (Colantonio, 2007). As Rydin and Pennington (2000) note, the desirability of public involvement is part of a tradition, which seeks to make the planning processes transparent and to expand the scope of public involvement in the policy delivery process. The overarching concepts at the core of social sustainability include basic needs and social wellbeing, social capital, equity and social and cultural dynamism (Bramley et al., 2006). Korten (1990) describes development as a process by which the members of a society increase their personal and institutional capacities to manage resources to produce sustainable and equitable improvements in their quality of life.

The importance of participation for the social sustainability of communities and places is that participation allows for communities to express their needs and aspirations, which subsequently impacts the policy-making processes (Healey, 1999). Participation also focuses on the democratic right to be involved in the public policy process. A more democratic participation can raise awareness of the cultural and social qualities of localities at the policy-making stage and avoid conflicts that may emerge in policy implementation later (Rydin and Pennington, 2000).

As the level of participation increases, the capacity for learning also rises for all stakeholders and participants including researchers, experts, and policy makers. This shift in emphasis from gathering data to increasing learning has been a trend in international participatory development theory and practice over the last twenty years (Seitz, 2001).

EVALUATION

The aim of any evaluation is to identify where change has and has not occurred, in order to make future work more effective. A good evaluation assesses what has been achieved against what was intended and explains why this happened in order to derive some lessons for future work (Graessle and Kingsley, 1986). Learning is at the core of any evaluation. For community participation projects, evaluation is a learning process for everyone involved. It is an interactive and egalitarian process, which must value all contributions and develop a sense of empowerment (Laurie, 1994).

Evaluation is not just a measure of change but can be a tool for change, and the methods must fit with the purposes, which is about creating change through participation, working with people, rather than doing things for or to them. A guiding principle therefore is to ensure that the methods used do not undermine the work that has occurred. Evaluation, in its simplest form, is a continual process of reviewing what has occurred and looking for ways to improve it (Laurie, 1994). The most comprehensive attempt to develop an evaluation framework is based on a theory of public participation, which identifies two key principles: fairness

and competence, against which participation processes can be judged (Webler, 1995). The fairness goal requires the equal distribution of opportunities to act meaningfully in all aspects of the participation process including agenda setting, establishing procedural rules, selecting the information and expertise to inform the process and assessing the validity of claims.

The competence goal deals more with the content of the process. A competent process ensures that appropriate knowledge and understanding of the issue is achieved through access to information and the interpretation of the information. Competence also requires that appropriate procedures be used to select the knowledge that will be considered in the process (Abelson et al., 2003).

CONCLUSION

The purposes of participation have been more modestly defined to include information exchange, resolving conflicts, and to supplement planning and design. Participation reduces the feeling of anonymity and communicates to the user a greater degree of concern on the part of the management or administration. With it, residents are actively involved in the development process; there will be a better-maintained physical environment, greater public spirit, more user satisfaction and significant financial savings.

An important point in the participatory process is individual learning through increased awareness of a problem. In order to maximize learning the process should be clear, communicable and open. It should encourage dialogue, debate and collaboration. Thus, participation may be seen as direct public involvement in decision-making processes where people share in social decisions that determine the quality and direction of their lives. This requires the provision of effective communication media in order to provide suitable grounds for user participation in designing.

Good planning for community participation requires careful analysis. While it is critical to examine goals and objectives in planning for participation, there are various techniques that are available, each of which performs different functions. In the last several decades, there have been numerous efforts to accumulate knowledge about various participation techniques, as well as the function that these techniques perform. Citizen surveys, review boards, advisory boards, task forces, neighbourhood and community meetings, public hearings, public information programs, interactive cable TV, have all been used with varying degrees of success, depending on the effectiveness of the participation plan. Since community participation is a complex concept, it requires considerable thought to prepare an effective participation program (Sanoff, 2001).

Our collective journey to find a way to live harmoniously with each other and within our social, economic, and ecological environments is a quest for sustainability. Community participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers (Sanoff, 2000). Many people view sustainability as that ideal goal or state towards which we strive (Brown and Peterson, 1994) and consequently, the idea of sustainability as a process has become commonplace. Although there are many themes and perspectives regarding sustainability it is not absolute and is dependent on social values. One perspective is social sustainability, which focuses on the need for changes in institutions and current social values.

Social sustainability encompasses human rights, labour rights, and corporate governance. Similar to environmental sustainability, social sustainability is the idea that future generations should have the same or greater access to social resources as the current generation. Social resources include ideas as broad as other cultures and basic human rights. Social sustainability is in essence about a shift from focusing more or less exclusively on the needs of the individual, community or country, to the needs that will meet the best interests of the whole. Therefore, a major activity of a democratic community is developing the attitudes, skills, process and institutions needed for people to engage creatively with their diversity (Atlee, 2003). Consequently, new tools are needed to address the environmental challenges of the present and future.

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Cognitive Phenomena of Style and Creativity

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Abstract

This paper explains a cognitive notion of style and creativity approached from reviewing the general concepts of design thinking and cognition, exploring patterns of cognitive operations conducted in the design processes, elaborating how style and creativity are coming from executing these cognitive operations. In fact, style and creativity are the resulting phenomena, or byproducts, coming from design cognition. Thus, based on the concept of resulting phenomena from cognition as the premise, this paper itemized the theories of "changing or modifying our ways of executing our design cognition, our style and creativity would be improved." Especially, style and creativity, as defined by features appearing in design products, should be treated as physical entities that they could be identified, recognized, and measured instead of abstract notions of intangible elements. Finally, the correlations between style and creativity are summarized to conclude the impact of design cognition. Hopefully, this paper will provide an outline for the ways to improve our style and creativity in design.

Keywords: Design Cognition, Design Problem-Solving, Design Thinking, Style and Creativity.

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COGNITIVE PHENOMENA OF STYLE AND CREATIVITY

Design is to intentionally develop means to meet the desired ends and is a problem-solving activity. There are many operational variables involved in each design project, and a designer would think through variables methodically to find a satisfactory solution. From an operational perspective, while solving different design problems/projects, designers might think differently, resulting in different "creative" forms, or think similarly that resulting in "stylistically" produced forms. Such thinking activities are unique in nature and different thinkers have different patterns of thinking on designing that deserve academic study.

This research explains the resulting phenomenon of designing from a human cognition point of view. Laid out in logical questioning sequences, the general concepts of design thinking, design cognition, patterns of cognitive operations applied in designing are reviewed; how style and creativity arise from executing these operations are discussed. A theory on "changing/modifying the ways of executing design cognition to improve individual style/creativity" is elaborated. These concepts will be of interest to readers in many design professions.

WHAT IS THINKING?

Thinking is a part of human intelligence, which occurs when a person is processing some knowledge in the mind to handle things that happened in front of him or her. When peoples think, they usually apply some kind of logical reasoning to achieve certain intended task; for instance, to ideate a concept, to formulate a creation, to make a judgement, or to solve a problem. Thus, thinking is, in fact, the activities of processing some "information or knowledge" in the brain managed by consciousness (or some mechanisms) in the mind. We could also say that the brain is the hardware and the consciousness in the mind is the software. It is the software that controls the entire processes of all information either stored in the brain or obtained externally through senses. Yet, we should also recognize that the consciousness in the mind is a part of the brain (Penfield, 2015).

WHAT IS COGNITION?

If we explain thinking as ways of processing information in the mind, then it is attributed to the human nature of cognition. Cognition relates to the mental processes of how humans perceive information in the world, selectively capture the attended information, imagine and convert the information into graphic representation (if it is needed in graphic related tasks), conceive and interpret the information to make it into knowledge, apply the information tactically to fulfil the intended missions, make judgements with reasoning on whether the situation has been satisfied, then develop a knowledge scheme of the case and store the scheme in memory for later use, and even fetch the information embedded in previous schemes from memory for re-use. Therefore, thinking is a part of human cognition in the mind on perceiving, interpreting, memorizing, retrieving, and reasoning information. This utilization of pieces of information to turn them into human knowledge, and the application of cognitive operations (or cognitive mechanisms) are the abilities of human intelligence. It is the cognitive operations that drive human thinking.

WHAT IS DESIGN THINKING?

Design thinking is the general human thinking process with additional attribute of design aspect. Here design is defined as intentions, plans, and plots for generating an abstract or physical thing that has functional and aesthetical value. Thus, if thinking is intentionally processed for purposefully generating certain things that are functional, valuable, and beautiful; then such thinking

is design thinking. Generally speaking, design thinking is how human beings work on arranging daily routines, developing intentions for creating artifacts, or managing operational processes for business purposes (Brown, 2009).

As a matter of fact, such thinking processes should be seen as problem solving processes. Then, what is a problem? A problem is when we face a task and don't know immediately what to do; then we have a problem. As such, thinking is the processes of figuring out what to do by utilizing internal and external information to solve various problems we are facing in all aspects, and design thinking is the process of solving problems with particular cognitive operations and intentional actions. Thus, design thinking is not only a kind of problem solving activity, but also a special kind of cognitive process.

Operational wise, design thinking could have been applied for solving everyday life routines to make a better life, to solve architectural design problems for generating a functional and buildable building, to solve business problems for creating elegant product designs, to solve engineering problems for manufacturing industrial designs, to solve aesthetical problems for creating a beautiful painting or sculpture, or even solving some learning problems in teaching to achieve the best learning effects, to name just a few.

WHAT IS DESIGN COGNITION?

If cognition is seen as the mental processes of getting, developing and utilizing knowledge from learning, perceiving, imaging, conceiving, remembering, and reasoning; then design cognition should be explained broadly as how human beings process cognition in some special ways to achieve beauty, function, and market value for what they want to do. Particularly, it is critical in design professions, for instance, in the fields of architectural, landscape architectural, engineering, graphic, interior, and product design, etc., some design related cognition should be utilized for design creation. This article concentrates mainly on the cognitive operations that would be applied in the design processes, which are the mental tasks of design cognition.

WHAT ARE THE OPERATIONS OF DESIGN COGNITION?

Based on the notion that design is problem solving activities, design cognition could be categorized into eight major patterns. These cognitive patterns are the cognitive activities utilized by designers in solving design problems. These patterns have been studied by scholars and discussed in various research publications, which are summarized in short and explained below with major selective citations.

1. Design is goal oriented and bound by design constraints

Design problem solving processes have certain fixed procedures to follow, which represent a series of design steps or sequential goals to accomplish (Chan, 1990). Each goal has its own scope of issues together with certain related constraints associated to consider while achieving these goals. Different goals have different constraints attached, which could be developed before the design starts or during the design processes. These steps of sequential goal procedure on addressing the connected issues and constraints were developed through years of design practices, and are critical on solving complicated design problems.

The resulting phenomena of this cognitive process is that the design processes move along more effectively and efficiently, designers are more aware of handling the sequences that are not goal oriented. On the other hand, the

goal-oriented processes are lineally focused processes; any change or unusual change of goal sequences would change the problem structure, thereby leading to the creation of a new product (Cross & Cross, 1995). Here, the problem structure means the overall layout of the problem framework.

2. Design is making associations

As explained by scholars in developmental psychology and cognitive psychology, human knowledge is built up by association (Anderson, 1980). Making association means to link new experience with what had been previously known in memory through association (Bower, 1970). Associations are formulated either by chronological contiguity, cause and effects, frequency of connection, similarity and contrast, or stimulus and response. After the knowledge is learned, it is also recalled by the same link of association from memory for application (Winner & Shohamy, 2012).

Likewise, design knowledge is also learned and recalled by association for designing. When designers work on a restaurant design, they would make associations with related design cases for reference or find design information on similar restaurant type to aid their design generation. Such kind of association is the concentrate thinking on related information, or convergent thinking type. However, it has been proposed that design problem solving should also involve a divergent, as opposed to a convergent, thinking process (Hatch, 1988). Divergent thinking is to make unrelated connections for design. If unusual associations are linked, its resulting phenomenon would generate an unusual idea.

3. Design is also performed by asking questions

In design, designers might keep asking themselves some hypothetical and "what…if…?" questions to constantly identify their standing point and orient their position in problem solving processes. These activities, depending upon the timing of the questions asked, do have the following multiple purposes. If the questions are asked in the beginning of the design stage, then the purposes are to set up problem constraints for limiting efforts on solution search. If the hypothetical questions are asked at the stage of developing solutions, then the questions are usually posted on simulating reality for evaluating the feasibility, consequences, potential impacts, or values. Resulting phenomena of this cognitive ability are that it is thinking in action (or reflection-in-action, Schon, 1983), and it is the learning in process on accumulating design knowledge. In some cases, unusual questions asked can lead to the generation of surprising results.

4. Design is utilizing knowledge schema stored in memory

In problem solving theory, the characteristic of getting a problem solution is to find a solution through searching for heuristics (Newell & Simon 1972). A heuristic is defined as what was learned from experience and developed into the kind of rule based common knowledge or common sense. For example, in solving one type of problem, the problem solver would search from memory to find a similar type of pre-solved case, and appropriately modify it to fit the current problem context. As long as the correct heuristic is found, a solution is soon to be achieved.

The heuristic stored in memory could also be categorized as a type of knowledge and termed *schema* by cognitive psychologists. A schema has a certain format of rule structure embedded that could be applied to solve similar problems (Anderson & Bower, 1973). Some of these design related knowledge schemata do have the character that there are isomorphic images associated (Kosslyn,

1975). Some images are clear and some are abstract. Designers could apply these images directly for solving design problems. Similar notions of applying previously solved old cases for the current new problem are called case-based reasoning, which were studied in the 1990s by scholars.

Possible phenomena of after utilizing knowledge schemata are that if more of the schemata are developed through practice and stored in memory, then the abundant knowledge information base would provide designers with more chances to recall, apply, and create that certainly would achieve the expert level. More applications of the same schemata might generate more similar design solutions, which would also share similar features across design products.

5. Design is finding, modifying, and building up representations

Representation is to use something to present and represent something else (Echenique, 1972, Chan, 2011). When a design concept is ideated, it must be converted into an image format in the mind (internal representation, Chan, 1997) and present it out to the real world through media of drawings or models (external representation). In the processes of designing, the internal and external representations must be modified from time to time to match together with the conceptual development for completing final form solutions (Eastman, 2001). These are the mental design processes of finding an appropriate representation for showing the concept or establishing an elegant representation of the abstract concept. If an unusual representation is developed, then its resulting phenomenon would have an unusual design product.

6. Design is the process of utilizing some reasoning

Thinking processes are supported or driven by reasoning, which could be deductive, inductive, or abductive. For instances, designers would use some facts or data to ask a particular hypothetical question to find its related specific situation (deductive reasoning, Magnani, 2009, pp.9-10), or based on some specific situation to ask for general principles and to look for generalization (inductive reasoning, Aliseda, 2006, p. 33), or even randomly ask a question from educated guesses (abductive reasoning, Peirce, 1997, p. 242) to keep the design activities in progress. Sometimes, when designers are in the processes of addressing functional problems in space, spatial reasoning would also be applied. Spatial reasoning relates to how people reason about the spatial relations among objects (Byrne & Johnson-Laird, 1989). These reasoning cognitions set up assumptions, and generate solutions to sustain the processes of design.

An experienced designer would use rules of inference relating to the three-dimensional aspect of objects in space to arrange functional compositions, predict and evaluate results for design solution generation. The resulting phenomenon on applying reasoning in design would be that a unique inference would lead to the generation of a consequential unique product regardless of what type of reasoning was applied.

7. Design is to use strategies for generating a design

While designers are thinking on form generation, they spend effort on developing strategic procedures and/or methodologies to strategically create the form. For instance, the elevation grammar used by Frank Lloyd Wright in his Prairie Houses design is a good example (Chan, 1992). In digital architecture, methodological or algorithmic approaches are also commonly applied for form generation. For example, for generating a high-rise building tower in Grasshopper, designers would use similar functional components for: (1) flexibly setting up the number of floors, (2) determining each floor height and orientation of lift to create the tower

body, and (3) using twist and angle functions to generate twisted shapes (if the designers choose to). These are the standardized sequences of form generation bound by the modelling nature or functions available in Grasshopper. Other generally or commonly used design methods include metaphor, analogy, and iconic representation. Utilization of any well-planned strategy would lead to the phenomenon of creating an outstanding form.

8. Design has the human nature of repeating or making repetition

Repetition is a cognitive strategy subconsciously or consciously used to repeat the same action or thinking. It happens in language, music, learning and design. For example, in language, repeated words in rhetoric would emphasize the to-be-expressed linguistic message to achieve the purposes of persuasion (Boisvert, 2011). In music, repeating a fixed rhyme, beat, or melody would generate a pleasant and impressive piece of music (Yeston, 1976). In learning, a repeated exercise (or called drill or rehearsal) on a particular task would improve learning effects (Atkinson & Shiffrin, 1968). Therefore, we learn how to ride a bicycle by repeatedly practicing. In design, repeated function in design and structure would make a coherent and economic building (Goodridge, 1998, Mithen, 2005).

The resulting phenomenon of repetition created in design products is rhythm. In fact, rhythm does generate some regularity, simplicity, balance, and hierarchical order of composition in the design products that could be well perceived and easily comprehended by beholders (Chan, 2012). Alvar Aalto's church design (see Figure 1) demonstrates such beautiful phenomena shown by the four repetitions of the same curved beam on ceiling. If there are skylights on top of the beam, then the shadows and lights casting onto the walls and floor would create another additional layer of rhythm, which can be seen in his Riola Church in Riola di Vergato, Italy designed in 1966.

Figure 1. Rhythm in Alvar Aalto's Heilig-Geist-Church design in Wolfsburg, German, 1958-1962. (Christian Ganshirt/Wikimedia Commons)

WHAT ARE THE PHENOMENA CAUSED BY DESIGN COGNITION?

From reviewing these eight essential cognitive operations and drawn from study data collected from conducting psychological studies (Chan, 2000, 2001) and case studies (Chan, 2015); two aspects of design patterns should be carefully discussed. These two special aspects of style and creativity are resulting phenomena coming from executing these design cognitions. In fact, style and

creativity do signify good quality of design and, thus, have been used as labels to represent certain special characters of designing.

1. Style

Style is the designer's special ways of doing things, which create certain characters in products. These characters are signified by features in products. Thus, style is recognized by the features occurring in a product and across products. It is the repetition of the same features displayed in products that manifests a style (Chan, 1994). Here, the term *feature* is defined as either the physical appearance of an element shown in a design product, or its functional feature of the product. The reasons of generating repeated features should be the design intention applied across products on the use of similar design knowledge schema, similar generated algorithm, similar reasoning, or even similar goal sequences that generate certain similar physical appearance or functional components (Chan, 1992, 1993, 2001). The recycling of these cognitions does create similar features and the reasons for continually using these design intentions might be caused by the designers' mindset. Yet, the driving force of style is the cognitive factor of repetition by repeating some cognitive factors yielding the same features in products, which automatically manifests the appearing and existence of a style.

2. Creativity

Creativity has been seen as the ability to create meaningful ideas, forms, sounds, methods, performances and interpretations; and all these creations ought to be new. From the point of identifying the driving forces of creativity, it has been defined operationally as "the particular actions of consciously operating knowledge through some reasoning to generate a design idea that has a certain functional, aesthetic and marketable value; and that resulting production is new, novel, beautiful, and accepted by the public (Chan, 2015). When a design product is generated by a designer that has never been generated before, then the design is a creative one and the designer is also creative.

Factors that trigger creativity are the execution of the following cognitive operations, as listed in the previous section: changing the design goal that changes the problem structure (item 1), making special associations to come up with a novel form (item 2), asking special questions to lead to a novel form creation (item 3), utilizing a special schema from memory that causes a special association (item 4), finding a special representation to make up a new form (item 5), applying special reasoning (item 6), and developing a totally new strategy to create a new form (item 7). As long as the exercises of these cognitive factors do lead to the creation of a novel form that is functional, marketable and has not been created before, then creativity is used to label such a design quality and ability.

WHAT ARE THE CORRELATIONS BETWEEN STYLE AND CREATIVITY?

Style and creativity do correlate to each other, which could be understood from seeing them as entities. In style, common features, created by a designer and appearing in his/her design products, are used to label the designer's individual style. A series of psychological experiment data (Chan, 1994) has proven that the number of four features appearing in a product is the threshold of defining a style. When the number of features in products is three, then it is the threshold of recognizing the style through perception. This is because when the number of features drops down to 3, interference among features affects visual perception (Chan, 1994). Thus, more features will manifest its style stronger than fewer features. Metaphorically speaking, a larger number of features will glue the style stronger than a smaller number that appears in products (Chan, 2000).

In creativity, features shown in products are also used to demonstrate a designer's creativity. If a feature is created by a designer that is new, novel and has not been created before, then this creative feature signifies the creativity of this designer. More of such features created by the same designer do demonstrate a higher level of creativity in comparison to other designers (Chan, 2015).

However, style and creativity are both the by-products of cognitive activities shown in design products, and they do have correlations. The correlation is affected by the cognitive operation. For instance, a novel project is created by unusual cognitive activities. Without the activities, creation would not be done, and consequently no style be generated. On the other hand and seen from the product side, the features used to define an individual style must be the original creation by the same designer and four of them repeated at least in three products. Thus, a stylistic designer is also a creative creator, but a creative designer might not be a stylistic one if the design products do not have four features repeated at least three times. Furthermore, the same style should be maintained for some period of time and followed by new creation to avoid negative impact from visual fatigue. If a stylistic designer has the style created for a long time without new changes of the style, then he or she is not a creative designer.

COULD THESE COGNITIVE PHENOMENA BE IMPROVED BY CHANGING COGNITION?

As explained, style and creativity are the phenomena generated by the cognitive procedures applied by designers in designs. The change of cognitive pattern would change the resulting phenomena, which would improve either individual style or creativity. Concepts are explained in the followings.

Can style be improved?

Style can be improved by expanding the degree of style through increasing the number of common features in products to make it strong (Chan, 2000). The way of increasing the number of common features in design is to create more new features periodically and repeat these features more times in more products. The concept of having more features appear in products to improve a style could be seen in the examples given in Figure 2. Figure 2 shows the designs of Prairie Houses style by Frank Lloyd Wright, Modern Architecture style by Richard Meier, and Sea Ranch vernacular style by Charles Moore. Numbers of common features created by the architects at that time of creation representing their style are ranged from 11-8, 6-5, and 5-4 respectively; details of their names are itemized in other publications (Chan, 2000, 2015). As explained, the degree of style is in proportion to the number of features, thus Prairie Houses style has the strongest style among them, whereas Modern Architecture style is more appealing than the Sea Ranch vernacular style.

Figure 2. Buildings designed by FLW, Richard Meier and Charles Moore.
2.1- Arthur Heurtley House, 1902. (Steven Kevil/Wikimedia Commons)
2.2- High Museum of Art in Atlanta. (Chris Yunker/Wikimedia Commons)
2.3- Sea Ranch House II taken from Littlejohn (1984), in Moore Tour section.

- A product that has a cute image would definitely attract more consumers or users. It is the same in style and could be enhanced by the creation of a fashionable and avant-garde appearance. Features having modern favour and vernacular character that match with on-going cultural trends would be more visually appealing than out-of-date features. Of course, a new feature that

has not been seen before and locates on the visual focus centre would also be an attractive style. For example, by comparing the Prairie Houses style by Wright or his followers, the New York 5 of Modern Architecture style, the vernacular style by Charles Moore in Figure 2, versus the Deconstructionism style by Peter Eisenman, and the Parametric Modelling trend generated by Zaha Hadid in Figure 3; different viewers and designers would have different preferences on selecting their appreciated styles. Young viewers might select more modern appearances of the style than the conventional styles selected by other age groups.

Figure 3. Buildings designed by Peter Eisenman and Zaha Hadid. 3.1- The Wexner Center for the Arts, 1989. (labia/Wikimedia Commons)
3.2- Heydar Aliyev Cultural Center in Baku, Azerbaijan, 2007-2012 (Interfase/Wikimedia Commons)

Could creativity be improved?

- Creativity could definitely be improved by triggering cognition to make a change, or even change the pattern of cognitive procedures. One notion is to make various associations to various resources or to make unrelated associations or links in design, which is the method of divergent thinking (Guilford, 1950, 1967; Torrance, 1962, 1966; Runco, 1991). Cognitive psychologists suggest that knowledge is learned from making association. When chunks of knowledge are learned and developed, they will be stored in memory by the same format of association, and retrieved later by the same links of association as well. Thus, it is suggested to make different connections between concepts to lead to different approaches for generating creative thinking. While working on a design, it is also suggested to do more reading on different fields of accounting, business, engineering, information technology, or medicine. It is because more exposure to various areas will increase the possibilities of instantly linking different information at hand for unusual design considerations. Of course, results from unusual links would definitely generate creative forms.

- Another notion of improving creativity is to provide an encouraging environment that allows divergent thinking. For instance, in design studio teaching, unusual design concepts created by students should be allowed and accepted to encourage out-of-box thinking. Results of out-of-box thinking might create a novel design product, which provides a potential opportunity for inspiring more creativity.

- Lastly, creativity could also be triggered by finding different representations. This notion can be found in cognitive psychology that the correct representation used could help solve a well-defined problem (Korf, 1980, Kaplan & Simon, 1990). In solving design problems, the representation used shall not only be right, but be unique. As a matter of facts, designers in their design processes are always searching for representation to represent the design solution. A unique representation would generate a creative work. For instance, the simple façade of the Azuma House designed by Tadao Ando is an unusual representation for the façade and entrance design, which is a solid wall with just a door opening without door panel or windows (see Figure 4). Thus, it was a new design concept at that time and was regarded as a creative design.

CONCLUSIONS

Thinking is human intelligence. Cognition is the factors that manage thinking. Design cognition is the thinking on generating some beautiful, functional, and marketable artifacts. Style and creativity are the cognitive phenomena caused by the executions of design cognition, recognized as entities and identified by the common features appearing in design products.

Figure 4. The façade of the Azuma House by Tadao Ando. (Wikimedia Commons)

The first appearance of a newly generated feature, if it is novel, beautiful, usable, valuable, and recognized by the public, would be the index of creativity possessed by the designer. More of such new creative features generated by an individual or a group signifies a higher level of creativity of the individual or group. When the number of features grows, then a set of features is formed. If the members of the set are repeatedly applied in many products by the same designer or the same group of designers, then a common feature set is shaped and an individual, historical, regional, or group style is manifested as well. More of the number of features in the common feature set does signify a stronger style of the person, period, region, or group.

If creative features in the common set appearing in design products are not compelling enough to be recognized by viewers, a creative designer would not be seen as a stylistic designer. Likewise, a stylistic designer might not be a creative designer, if the common set of features stays for a long time without new creations. Architecture design and fashion design are two good examples in this regard.

As a summary, features that exist in products must be changed from time to time. Any change of feature would change creativity and style. However, the quantity (the number of features) change of style and creativity is not that significant as their changes on quality (the content of features). A cute product style is a generation by a creative designer driven by creative cognitive patterns that would be popularly loved by users and viewers. After the quantity of features reaches the threshold of three, its signified style is recognized, then the quality of these features is more important than their quantity.

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Embodied Time: Applied and Incidental Architectural Narratives

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Abstract

In this analysis of storytelling through building, encompassing a search for practical applications for how future buildings can embrace the passing of time, narrativity has been categorised into: the 'applied' or 'artificial', meaning the construction of a directed story, identity or philosophy; and the 'incidental' or 'organic', the accidental erosion and patination caused by weathering and human use. In 'Building Time', David Leatherbarrow considers three groupings for his analysis of buildings inhabiting the temporal dimension. The 'Time of the Project', the alterations, adaptations and adjustments made to a building, can be considered a prototype for 'applied' narrativity, while his 'Time of the World' can be linked to the gathering of 'incidental' narrativity. Leatherbarrow's third aspect, the 'Time of the Body', can be compared to the phenomenological aspects linking these categories together, directing human passage and activity through design cues and through the traces of those who have come before (Leatherbarrow, 2021). At times these categories overlap and intertwine with each other, mirroring the idea that in the communication of narrative the "the corporeal is not more fundamental than the intellectual, but… are entangled" (Austin, 2012: 108). In summary, the aim is for an architecture that may "articulate the experiences of our very existence" (Pallasmaa, 2009 :19). Therefore, as time passes and our experiences become history, we can still tell our stories through the medium of building. This methodology to create buildings with a high degree of 'story-ness' was later tested in the design of a new library and literary museum. Based in Nottingham's Lace Market, the existing tale of County House, a derelict and crudely adapted Georgian townhouse, was clarified, curated and secured, while the adjacent plots provided opportunities to experiment with applied and incidental narratives told through new buildings..

Keywords: Applied, Architecture, Incidental, Narrative, Time.

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Figure 1. Detail view of 1:20 elevational model of St. Bartholomew the Great's Church Gatehouse, Smithfield, c. late 17th Century.

INTRODUCTION: NARRATIVITY AND THE BODY

The human mind appears carefully attuned to seek out narratives and stories, through which we attempt to make sense of the chaos of existence. This inherent drive to find meaning, or "*the notion that we understand things in terms of images, or by 'telling stories' about the world*" (Hale, 2000: 109), is labelled as a result of humanity being 'ontogenetic', in opposition to the idea that the search for narrativity is a result of cultural influences (the 'phylogenetic' perspective). It is, however, "*not impossible to conflate these positions by accepting narrative may be hard-wired into the brain but can also be prompted and developed through practice*" (Austin, 2012: 108). Though storytelling can occur through the recital of facts and figures, 'narrative environments' have the advantage of "*appeal[ing] to the visitor's intellect through their body and, vice versa, through their body to their thoughts… through a variety of sensory means*" (Austin, 2012: 108), resulting in a far more emotive and 'primal' engagement. Though an individual's response to a narrative space will be subjective and can never truly be an accurate summary of interlocked and inconclusive events, the power of architecture in its role as a storage vessel for history represents the greatest possible chance for our own narratives to be remembered.

Phenomenological philosophy would appear to support the 'ontogenetic' viewpoint, with information gathered through the body's senses and naturally reconstructed into meaningful concepts by the mind though "*a kind of pre-linguistic understanding, the notion that the world is already meaningful for us before it is 'parcelled up' into language*" (Hale, 2000: 105). Deriving narratives by picking up on clues from our surroundings therefore provides the potential "*to return to that world which precedes knowledge, of which knowledge always speaks*" (Merleau-Ponty in Hale, 2000, 105). In architecture, then, narratives can be written that create bridges through time, speaking of the values and technologies of previous societies, personal identities and aspirations, the history and traces of human movements and desires, and further back to an area's geological past, its climate, resources and flora, along with our own place within

history. Via the various senses received by the body, the past can live again, aiding us in 'orienting' ourselves within the world. While phenomenological place can be defined as anywhere where 'dwelling' (human activity) occurs, where environments are felt to be 'meaningful' (Norberg-Schulz, 1980: 5), narrative too can be said to be 'gathered' wherever human activity takes place. While technologies and fashions may pass, it is the notion that humans never truly change that provides our 'existential foothold'.

In this analysis of storytelling through building, encompassing a search for practical applications for how future buildings can embrace the passing of time, narrativity has been categorised into the 'applied' or 'artificial', meaning the construction of a directed story, identity or philosophy, and the 'incidental' or 'organic', the accidental erosion and patination caused by weathering and human use. In 'Building Time', David Leatherbarrow considers three groupings for his analysis of buildings inhabiting the temporal dimension (Figure 2). The 'Time of the Project', the alterations, adaptations and adjustments made to a building, can be considered a prototype for 'applied' narrativity, while his 'Time of the World' can be linked to the gathering of 'incidental' narrativity. Leatherbarrow's third aspect, the 'Time of the Body', can be compared to the phenomenological aspects linking these categories together, directing human passage and activity through design cues and through the traces of those who have come before (Leatherbarrow, 2021). At times these categories overlap and intertwine with each other, mirroring the idea that in the communication of narrative the "*the corporeal is not more fundamental than the intellectual, but… are entangled*" (Austin, 2012: 108). In summary, the aim is for an architecture that may "*articulate the experiences of our very existence*" (Pallasmaa, 2009 :19). As time passes and our experiences become history, we can still tell our stories through the medium of building.

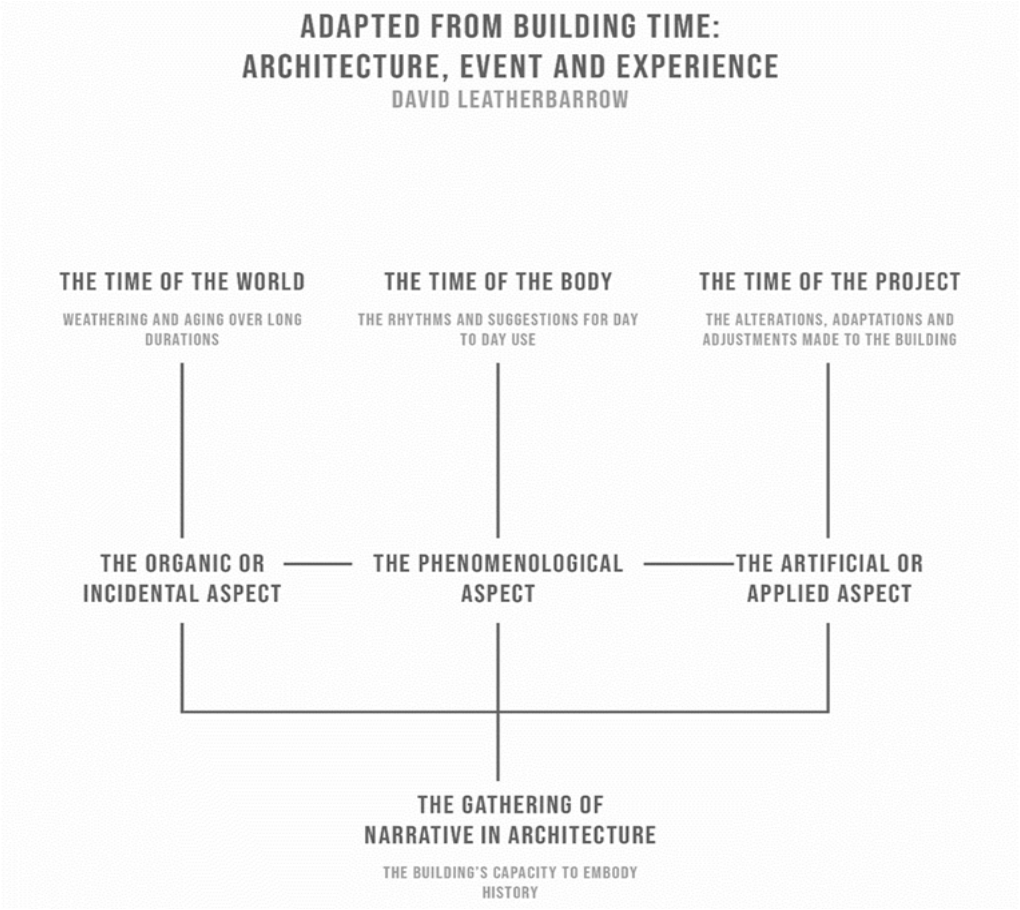


Figure 2. Adaptation from Leatherbarrow's 'Building Time' tracing 'Applied', 'Incidental' and 'Phenomenological aspects of narrative in architecture.

APPLIED NARRATIVITY: THE TIME OF THE PROJECT

As buildings are "*created out of specific circumstances… determined by the available means, techniques and traditions*" (Cramer and Breitling, 2007: 15), all buildings inevitably hold a fundamental (but at times unintended) level of applied narrativity. Within this lies the story of the cultural, technological and material qualities of a structure's time and place. This can be seen to some extent in any building: Le Corbusier's Villa Savoye speaks of a conscious rejection of a certain past and an optimistic belief in purity and new technology after the Great War, while the Nottingham Contemporary communicates a curated viewpoint of the development of its site in its form and materiality, as well as of its increasingly eco-conscious time of construction. In responding to its surroundings, architecture can manifest a place's 'genius loci', allowing, whether "*based on religious beliefs or the structure of the cosmos… narratives [to be] 'concretised', in ways specific to their geographical context*" (Hale, 2000: 115), but also a building's positioning within time.

This 'applied' narrativity can also be seen in the continued adaptation, alteration and deliberate destruction of buildings to suit new uses. While entropy will naturally alter a structure over a period of years, "*more often, it is functional requirements and the needs and wishes of the owner and user that result in changes being made to existing buildings*" (Cramer and Breitling, 2007: 15). These changes can result as a rich palimpsest of history, brought about by *the* "*quick succession of different historic circumstances, of fashions and styles and the rapid development of new building techniques*" (Cramer and Breitling, 2007: 17). In a pertinent historic residential case where variables other than the changing of fashions have largely been controlled, Shropshire's Bletchley Manor features two surviving Elizabethan forms and one 1830 rebuild. These iterations are similar in form, spatial characteristics and material technologies, but distinctly different in styles, as a result of Georgian financial difficulties that foreshadowed *The Society for the Protection of Ancient Building*'s (SPAB's) deliberate approach to denoting change by forty-seven years. Elsewhere, Eric Parry's germane work at the late fourteenth century Old Wardour House, Wiltshire, "*weaves a skein of connections between past and present*" (Hunt and Boyd, 2017: 133), evoking the spirit of the ruin through the use of contrasting lightweight glass and solid stonework, ensuring a key period of the house's history can be experienced in changing lighting conditions and senses of mass as it is passed through. While built using the same materials as the older building, the join is legible, with new stone being contrastingly "*smooth and refined – as if imitating the characteristic of glass… and inviting the striations of history that will themselves become history*" (Hunt and Boyd, 2017: 133). Even where a building's physical fabric has been largely preserved, the narrative of a place can be read in the reconfigured spatial hierarchies. At Astley Castle in North Warwickshire - a moated fortified sixteenth century manor house where new intrusions do not "*mimic the original or pretend to be historic*" (Slocombe, n.d.: 18) and can be understood clearly as part of the building's evolution - another layer speaking of the castle's downfall and resurrection can be experienced (Figures 3-4). The Great Hall, once the heart of the building, now forms a dramatic open courtyard that poetically underscores Astley's changing fortunes (Figure 5).

Figure 3. 21st Century alterations to Astley Castle show obvious signs of contemporary repair, highlighting the building's recent history.
Figure 4. The stabilisation of a ruin, fixing it at a certain point of decay, overlays an applied narrative over the incidental damage that has occurred over time. Shown here are Nottingham's 1857 Great Northern Railway warehouses, damaged by arson attacks and left a roofless shell.

Figure 5. Changing spatial hierarchies over time at Astley Castle can be read in the building's fabric.

The SPAB's approach is not uncontested, with classicist Robert Adam seeing *"nothing wrong and everything right about using obvious and understandable tradition in new design"* (Adam, 1998: 37) and arguing that this is a practice that has been occurring for centuries through the periodical revival of older styles, and perceiving that in the present-day modernism has become *"no longer a break with tradition; it has existed for over seventy-five years to become our tradition"* (Earl, 2003: 85). A potential weakness of this approach is that abiding by the rules of a style too rigidly and not daring to change and adapt to new times can result in the erasure of true narrativity. Rather than contrasting for its own sake, the grammar and language of a building can instead be understood and adapted to in manners which transcend notions of architectural style. At Poundbury, an experimental development that seeks to replicate the characteristics that make historic towns and cities rich in activity and persistence, alterations to buildings must adhere to principles set out in a design code, which limits even minor alterations to the colouring of doors and window frames (Figures 6-9). In pathologically preserving an applied 'sense of place', this mentality avoids the fact that a place's spirit (genius loci) develops through a history of inhabitation, and *"is never complete. A [place] can never completely escape its own time, whatever misfortunes may befall it, but neither can it remain locked changeless in that time"* (Earl, 2003: 75). While later editions of the code are more permissive towards alterations, narrativity, adaptability, and therefore durability are potentially stifled by a lack of recognition of a changing world. Focusing solely on outward appearance, the code does not consider spatial characteristics and alterations, through which a rich history of bodily responses and connections through time are possible.

Figure 6. Poundbury elevation original. *The natural selection of architecture: Poundbury's potential futures when narrativity and adaptability are stifled. A structure that cannot adapt will fall into disuse, while one which may adapt will survive.*

Figure 7. Poundbury elevation abandoned. If a lack of adaptation is enforced excessively strictly, the durability of Poundbury's architecture will be reduced, contrasting the Georgian structures Poundbury seeks to emulate which have survived through changes in functions, lifestyles and facilities.

Figure 8. Poundbury elevation traditional. Alterations carried out to the design code may allow a building to adapt to changing times, but real narratives are made illegible where buildings cannot speak of their own time and evolution. New spatial types, such as garages, may sit uncomfortably in an existing style.

Figure 9. Poundbury elevation modern. Where a building can freely adapt to suit changing times it has a greater chance of long-term survival. The applied story of the building is made readable, with adaptive reuse of existing elements (the garden wall arch) contributing to the accumulating layers of history.

This category of narrativity also considers the architectural choices made to direct visitors through a building. Orientation towards natural light can direct desires and potential bodily actions, while the denial of it can "*dim the sharpness of vision, make depth and distance ambiguous, and invite unconscious peripheral vision and tactile fantasy*" (Pallasmaa, 2012: 50), heightening more 'primal' sensory experiences. Museum design, the central purpose of which is often to construct and relate a coherent narrative, commonly manipulates bodily responses to communicate stories. All the senses can be involved: with sound creating "*a wider space; it implies excavated architectural space and makes us aware of the not-immediately-visible, of presences we can sometimes only intuit*" (Pollard in Littlefield and Lewis, 2007: 196); touch "*mediat[ing] the messages of invitation or rejection, nearness or distance, pleasure or repulsion*"; with even smell and taste at times adding to recreating an atmosphere, be that of oily machinery or sea air, as is the case at Portsmouth's Mary Rose Museum. In "*recreat[ing] the dark and claustrophobic atmosphere found below a ship's deck*" (Frearson, 2013), WilkinsonEyre have enclosed an amphitheatre-like space, representing "*a coming together*" (Norberg-Schulz, 1971: 44) across time, and putting visitors into the sphere of orientation of their Tudor forebears by replicating the missing half of the hull. Dim lighting and cool temperatures heighten the experience while aiding in the conservation of artefacts, while sound effects and projections mimic the lives of Tudor seafarers as part of a constructed narrative. This results in far more emotive and connected responses than could be achieved through a straightforward recital of known facts.

INCIDENTAL NARRATIVITY: THE TIME OF THE WORLD

"It seems possible, even probable, that given this intimate symbiosis between people and buildings… buildings might absorb some of the evidence of our existence, our narratives." (Littlefield and Lewis, 2007: 228)

The laws of entropy dictate that disorder and degradation occur naturally as time passes. This is an unavoidable fact of existence, despite frequent attempts to resist it in the quest for timeless idealism. Rather than fighting against it, mild dereliction can instead be a boon for design: traces of human life are left in the erosion and decay of architectural elements, recording an 'organic' or 'incidental' narrative and providing a phenomenological link through time to the actions of generations who have come before, thereby placing people in direct contact with the same bricks and stones that were scuffed and handled by our predecessors. This ability to relate and emote via *"the traces and scars of history [that have left] their mark[s] on the building fabric in successive layers"* (Cramer and Breitling, 2007: 15) is arguably a far more powerful tool for an assessment of an ancient building's significance than its relative completeness: these characteristics become *"an inseparable part of a building and its qualities."* (Cramer and Breitling, 2007: 15).

At its most literal, incidental narrative can be 'gathered' by an architectural work through the accruing over time of *"biological debris – the dust of flaking skin, the hair, the exhaled air, the humidity, heat and bodily fluids that get left behind by generations of occupants"* (Littlefield and Lewis, 2007: 10), all of which can *"only combine to form a peculiarly human trace"* (Littlefield and Lewis, 2007: 10). Though traces of human activity may fade as time passes or surfaces are cleansed, for long periods *"the warmth, grease and breath of past inhabitants will have contrived, however subtly, to alter the fabric of the place"* (Littlefield and Lewis, 2007: 11). It is clear that this 'gathering' of a building's incidental narrative is a quality that must be earned, rather than created. The discovery that implied aging and erosion expressed through a building has been falsified, however effectively, *"diminishes [the building] in stature and [makes it] less worthwhile: and this although the building remains the same. The entire change has been in the mind"* (Warren, 1998: 16), thus illustrating the subjectivity of experiencing a story. While the mental abridging and editing of the stories implied by factual physical evidence of human activity can perhaps never accurately recreate the past, the act of experiencing an ancient building *"is about as good an expression of how people lived as it is possible to get"* (Moth in Littlefield and Lewis, 2007: 20).

A physical link to the past through repetitive human activity can be found in the eroded stone steps of the Chapter House at Wells Cathedral, Somerset. Dating from c.1286 (Historic England, n.d.), these stairs have been worn smooth over the last seven centuries by the continued passage of users, with a clear groove having been cut in the floor one arm's length from the handrail running alongside the passageway. A second, less defined trace runs parallel to the main channel, standing as testament to those who have walked alongside others, pushed out towards the centre of the staircase. A less desirable inner route up the stairs, obstructed by a stone moulding at the base of a column, remains almost pristine (Figure 10). This is architecture acting as a record of human life, and *"implied in that record are human interests, orientation, and desires. As ages pass and the temporal horizon widens, the work functions less like a clock or calendar than a chronicle… These steps… have authored a book whose later chapters are still to be written"* (Leatherbarrow, 2021: 15).

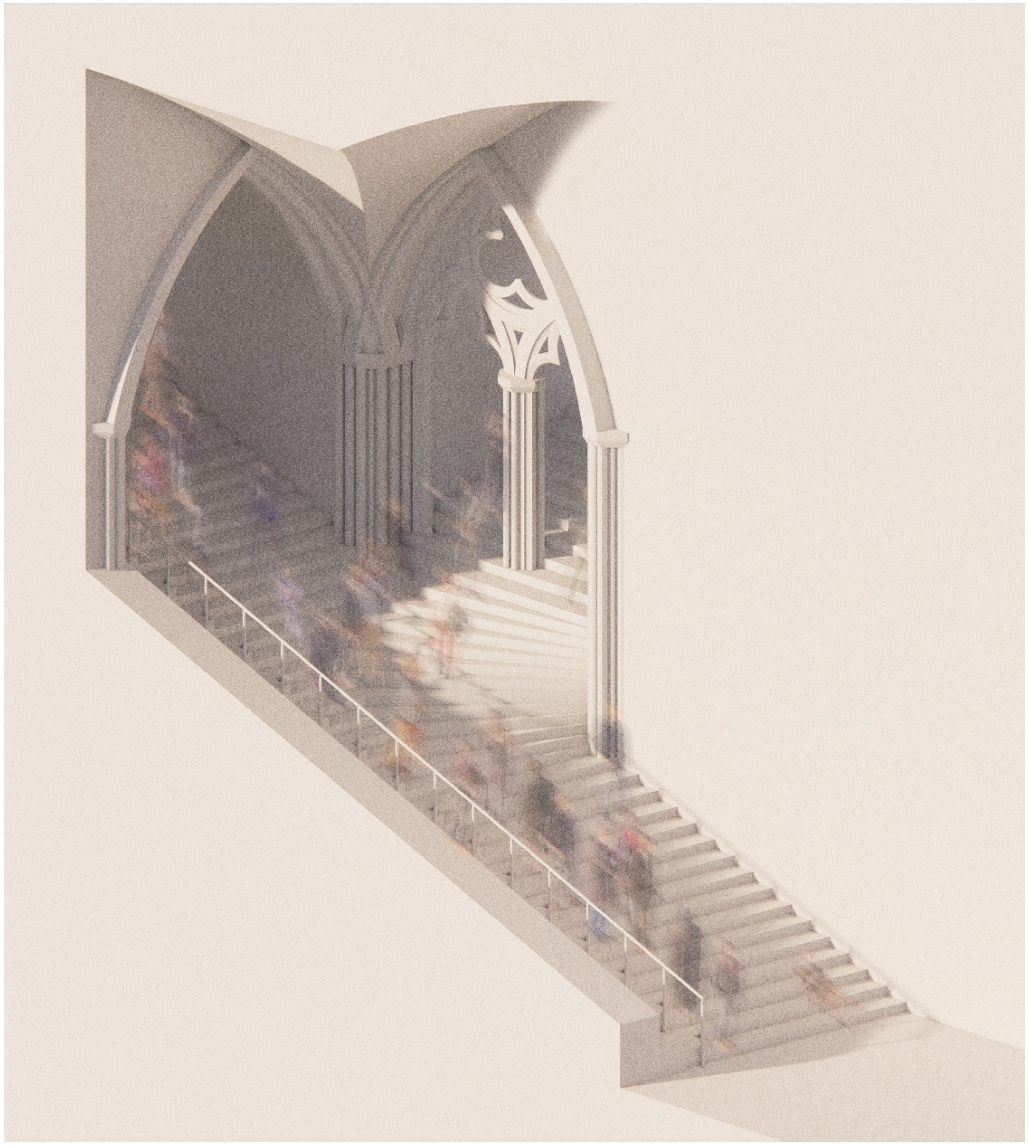


Figure 10. Steps on the approach to the Chapter House at Wells Cathedral record centuries of activity.

The erosion of the Chapter House steps physically positions the user in the footsteps of their predecessors, the traces of their footsteps echoing through time as *"a continuous meeting and joining of the hands of successive generations"* (Pallasmaa, 2009: 51). The stone surfaces act here as *"coordinated elements of visual and tactile sensations"* (Hale, 2000: 121). This can perhaps be considered as a reconciliation of the 'mortal' and 'divine' of Heidegger's 'gathering of the fourfold', with each individual (mortal) user seemingly barely impacting the surface but primally acknowledging their part in the broader continuum of humanity with our similarities across time (the divine). The faint trace left behind by every person to have ever climbed these stairs *"is the impression that appears once the force comes to rest; or, put differently, it is the rest of the movement, its remainder, or remnant. In perceptual experience, a remainder is often a reminder. Legible architecture offers experience remnants of this kind"* (Leatherbarrow, 2021: 67).

The other pairing gathered by 'the fourfold', the earth and the sky, is recorded in the ways in which the building's material elements weather and change with age. The greying of timber in sunlight, the erosion of brickwork caught in the wind and the streaking of walls from rainwater, like *"a face thus saddened by tears… also bear[s] witness to being in the world and the passing of time"* (Mostafavi

and Leatherbarrow, 1993: 69). The concept of aging and weathering on a building as a negative factor, supported by the modernist view of architecture as a Platonic ideal, can be opposed by the Aristotelian system of assigning more value to real objects, 'added to' by their imperfections. New buildings are often spoken of as 'bedding in', the reality of which is that they are subtly physically adjusting and responding to their place and beginning to record its story. This 'genius loci' (Norberg Schulz, 1979), recorded through weathering, will include the building's orientation towards the sun, where in a notional building towards the north a surface may "*become darker in colour; on the sun side, the hue has lightened, saturated, and bleached surfaces*" (Leatherbarrow, 2021: 68). Local climate conditions and the area's history will also be recorded in time. The soot blackened façades of Lenton's Holy Trinity Church in Nottingham, streaked vertically by falling rain, narrate clearly the city's industrial heritage along with frequent precipitation (Figures 11-13). Though weathering tends to *be "a power of subtraction, a minus, under the sign of which newly finished corners, surfaces, and colours are "taken away" by the rain, wind and sun"* (Mostafavi and Leatherbarrow, 1993: 6), the relatively recent scrubbing of Manchester Athenaeum's sooty crust seems a loss, the erasure of the city's coal-fired past in an 'applied' alteration to the city's apparently self-conscious image to erase the time when *"the soot had crystallised and the buildings actually glittered in black"* (Crompton in Gallagher, 2018). This romanticism, however, is admittedly not always practical; after all, *"the patina of decay… lose[s] all sense of meaning in the wreckage of a long-empty building… if decay goes unchecked, the building will eventually fall apart and become a ruin."* (Littlefield and Lewis, 2007: 17).

Figure 11. Holy Trinity Church, Lenton, Nottingham. Axonometric sketch.

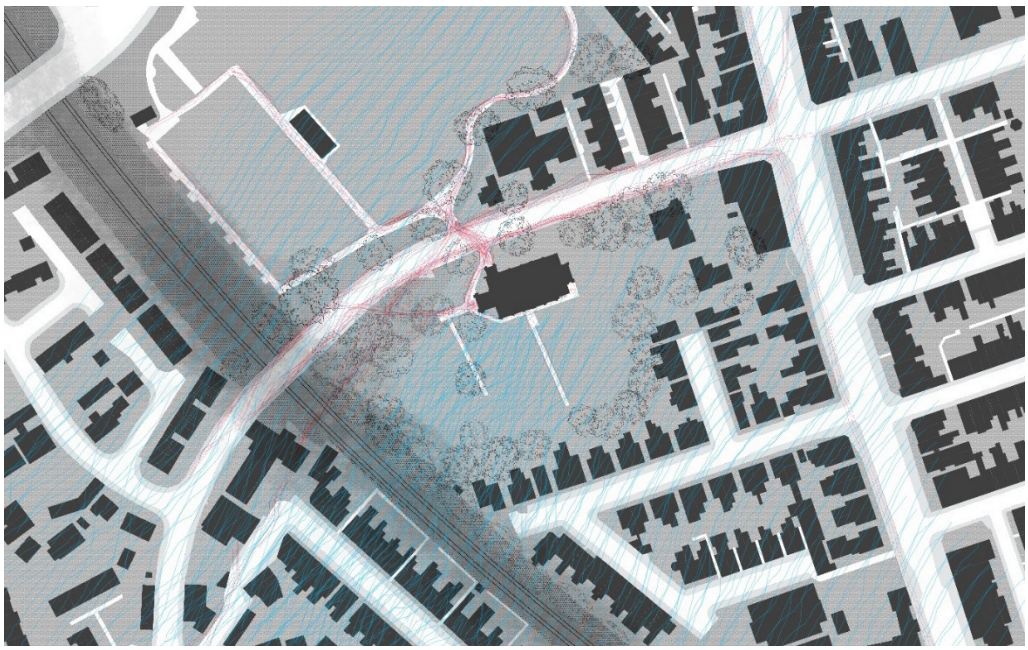


Figure 12. Holy Trinity Church, Lenton, Nottingham. Weathering patterns.

Figures 13. Holy Trinity Church, Lenton, Nottingham. Photographs of weathering.

Analysis of routes, local building traditions, the climate and societal and technological trends can allow the broad sweeps of incidental narrativity to be predicted and applied narrativity to be understood. A useful tool for design work, this methodology can be tested against architectural works that have stood long enough to have gathered weathering, in this case Lenton's Holy Trinity Church of 1842. Analysis suggests that the south and western facades should be the most heavily streaked with soot, with prevailing winds driving pollution from the adjacent railway onto these faces and sunlight fixing particles into place. The greatest foot traffic occurs to the north and is likely to have resulted in deterioration of steps and surfaces. The history of the building can be read in the legible repairs and alterations which have taken place over the years, and a phenomenological link can be made to past generations through the actions of chisels on stones, feet on steps and hands on railings.

NARRATIVE CYCLING: BUILDINGS THROUGH TIME

Narratives written into the construction of buildings, along with the alterations wrought by natural and man-made interactions, do not exist in isolation. Proverbially, from "*the moment the last craftsman has left a house… decay begins*" (Cramer and Breitling, 2007: 15), immediately pushing a building along a

linear spectrum from the applied towards the incidental. Once the accumulated palimpsest of aging and alteration has been ongoing for centuries, how can a building as a complex whole be considered to embody only one of these narrative types? A more appropriate model, based on the historic precedent of buildings aging and crumbling before being repaired and altered, may be cyclical, with history repeating itself time and time again (Figure 14).

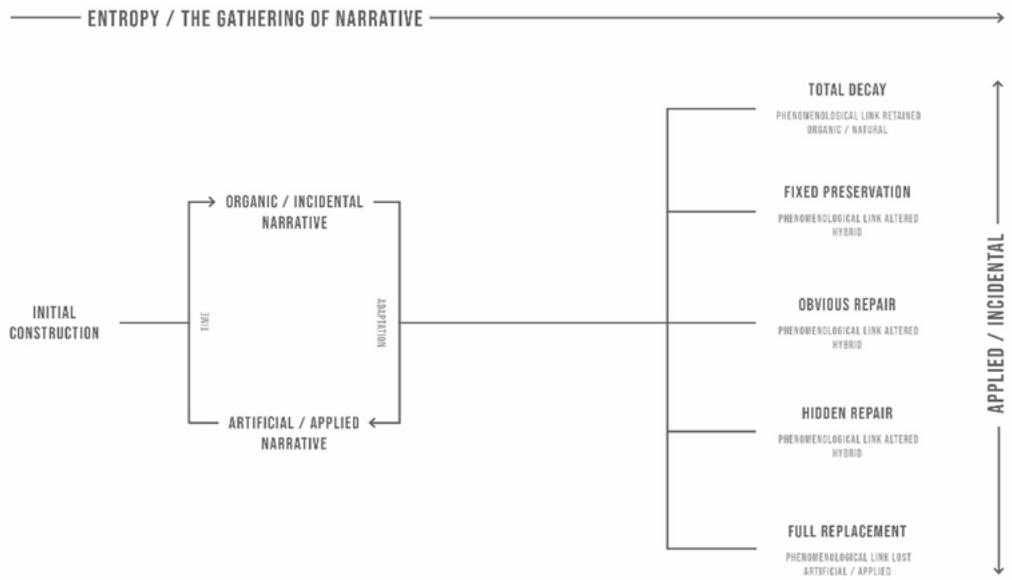


Figure 14. Diagram demonstrating narrative cycling.

This conclusion is most apparent when the building elements most susceptible to change are examined, often the parts most exposed to human touch or most exposed to uncontrollable external conditions, but which are large enough to warrant phased repair and alteration rather than wholesale replacement. This theory can be tested against the facades of the gatehouse of St Bartholomew the Great, Smithfield, itself initially constructed in the 13th Century as part of the church's nave (Figures 15-16). At the dissolution of the monasteries the building was ransacked and partially demolished in 1543 in an act of overlaying a new applied narrative (the removal of historic elements at times being an equally powerful tool in storytelling, in this case of the downfall of the priory and the supremacy of the Tudor monarchy). After a period of decay, a new timber-framed gatehouse was constructed over the old arch in 1595 as a London residence for the powerful Scudamore family, its grand, then modern, façade ornately decorated with their coat of arms and religious carvings. Over time, this timber structure will have warped and greyed in the south-western light, its wattle and daub infill crumbling and vegetation climbing the structure; an incidental narrative recording declining fortunes. In the Eighteenth Century the building's appearance was modernised with the addition of mathematical tiles mimicking brickwork, its inexpert bonding perhaps speaking of financial difficulties in contrast to the desired narrative of modernisation and a new London arising from the surrounding clay. As is inevitable, in time this elevation also decayed: period photographs document the loosening of tiles and the blackening of the brickwork amid the smog of the industrial revolution, but also small eddies of applied narrativity in the abortive attempt at plastering the façade and the addition of signage indicating the structure's new role as retail premises. These changes were lost in 1916 during a German Zeppelin raid, resulting in the collapse of the Georgian façade and the rediscovery of the gatehouse's medieval origins, at which point applied narrativity took over once more and the building was restored to its current condition, complete by 1932,

Figures 15. 1:20 models of the façade of the gatehouse at The Priory Church of St Bartholomew the Great through time, illustrating the cyclical relationship between applied and incidental narrativity.

as an artificially directed view of London's past. Though the traces of this raid were expunged from the building, losing an opportunity for phenomenological links back to the time of the First World War, an arguably less poignant memorial to the fallen was affixed to the building, along with a written record attesting to the building's 20th Century reconstruction. Since this time, the building has again begun to weather and change, embarking on another loop of its narrative cycle through the embodiment of incidental influences. In 2020, by which point *"the gatehouse had become dark and dingy, the handsome iron lanterns were not working, the paint was flaking and the ironwork was corroded"* (Heritage of London Trust, 2020), a new narrative eddy was applied in the restoration of the heraldic gates, although less telling to the observer due to their exact replication of what had come before.

Figure 17. Surviving fragments of the Augustinian priory, reused and heavily altered over the intervening years, record changing fashions, fortunes and technologies in physical form.

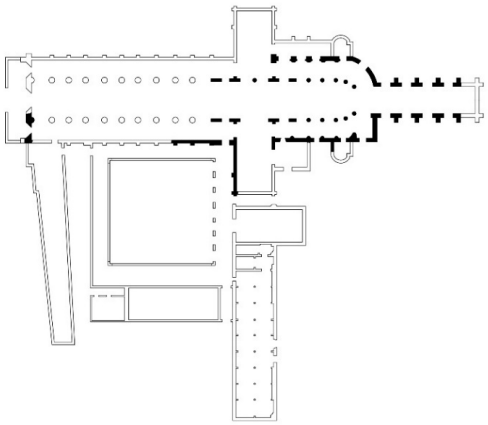


Figure 16. A speculative reconstructive sketch of the church's nave facing Smithfield has been created based on surviving fragments, archaeological data and 16th Century maps, giving an impression of the appearance of the building before 1543.

In writing about weathering and clear alterations to buildings, excessively *"romanticising the patina of decay could easily become a dangerous cliché"* (Littlefield and Lewis, 2007: 17). No building can last forever, and in time, once a building (or building element) reaches a point at which it can no longer be effectively used, a change must be implemented. While framed here as the outcomes of the breaking of a narrative cycle, it is also worth considering that these methods may form just another stage of that same loop, themselves eventually turning to dust. Returning to the example of the Chapter House steps at Wells Cathedral, a series of models illustrate five potential outcomes, each method increasing in its degree of applied narrativity away from incidental decay, but with each intervention diminishing a potential phenomenological

link to the past (Figures 18-23). Fred Scott divides the fate of all architecture into *"remain[ing] unchanged, to be altered or to be demolished"* (Scott, 2008: 26), though here alteration and remaining as-built have been further split to reveal differing approaches in restorative building philosophy.

Figure 18. Initial Construction: Potential to gather incidental narrative.
Figure 19. Total Ruin: Phenomenological link retained.
Figure 20. Fixed Preservation: Phenomenological link altered.
Figure 21. Obvious Repair: Phenomenological link altered.
Figure 22. Hidden Repair: Phenomenological link altered.
Figure 23. Fixed Preservation: Phenomenological link lost.

Arguably the purest approach, the least reliant on curated narrativity, would be to let old buildings fall into total decay without intervention. In this case, the traces left by our forebears and the other ravages of time remain unaltered, though of course these too will eventually dissolve beyond meaningful bodily interpretation. While it may be tempting to believe that a building can remain in this romantic state forever, this is *"largely an idle and pointless fantasy"* (Littlefield and Lewis, 2007: 17) if the building is to have any practical purpose. The wish to conserve a structure in a permanent state of decay, here titled 'fixed preservation', paradoxically involves an applied interpretation of the past. The resultant building, cleansed of 'the wrong type' of organic decay, *"does not represent a 'natural' state of the monument, neither can it be said to have achieved the perfectly sustained, nearly unchanging state of a museum object. It is in many ways a work created to fulfil instructional, aesthetic and emotional needs"* (Earl, 2003: 70). Rome's Colosseum, before the 19th Century was a wild and overgrown garden with *"long grass growing in its porches; young trees of yesterday, springing up on its ragged parapets, and bearing fruit: chance produce of the seeds dropped there by the birds who build their nests within its chink and crannies; to see its Pit of Fight filled up with earth… is the most impressive, the most stately, the most solemn, grand, majestic, mournful sight conceivable"* (Dickens in Cooper, 2017). Though saved from destruction through stabilisation and pruning, the lifeless sterility has meant a significant chapter of the building's history has been lost. A weakness in the interpretation (and therefore the rewriting) of narrative is its inconsistency: *"certain parts of a crumbling building, the ancient stones and arches, for instance, are deemed "proper." Other parts, like the plant life and the later historical stages of the ruin, are deemed "improper" and are removed"* (Cooper, 2017).

Where a building can be practically repaired, perhaps the more 'honest' approach is to make repair work visible and legible, as seen in the 2012 repair of worn 16th Century stone steps at the University of Cambridge where a composite resin was used to recreate the missing fabric. This can be juxtaposed with the almost untraceable repairs seen alongside. While undeniably exhibiting a high degree of craftsmanship, and while in both cases the experiential link to the traces of former users has been lost, where repairs are clearly denoted they can at least be read visually, balancing sentiment with practicality. Different

approaches will always be suitable in different situations: John Earl, writing in Building Conservation Philosophy, admits his tendency to *"sometimes wonder whether it is really necessary to shout the truth from the house-tops. Aggressively visible repairs can distract attention from the very qualities that mark out a building for preservation. A little discretion may be no bad thing"* (Earl, 2003: 109) A final outcome, and one which may follow many cycles of alteration, is a building's total demolition, taking with it all traces of those who once inhabited it. While this may seem like the end of one narrative and the beginning of another, this is not necessarily always the case: intangible traces of the old structure, and the world it was built into, may persist long after all physical traces are gone. New towers within the City of London remain constrained by a street plan that was set out centuries ago between plot sizes dictated by timber-framed spans. This pattern of new buildings squeezed into ancient plots is common to many British cities, and can be seen clearly in Nottingham's Lace Market, where few truly ancient structures survive (Figures 24-26).

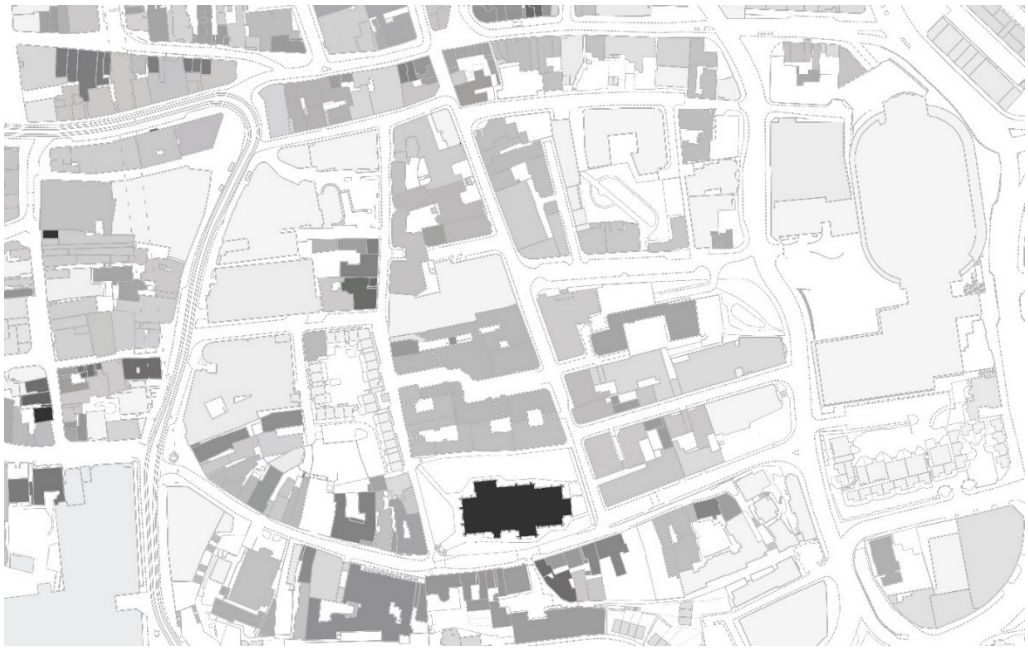


Figure 24. Building persistences.

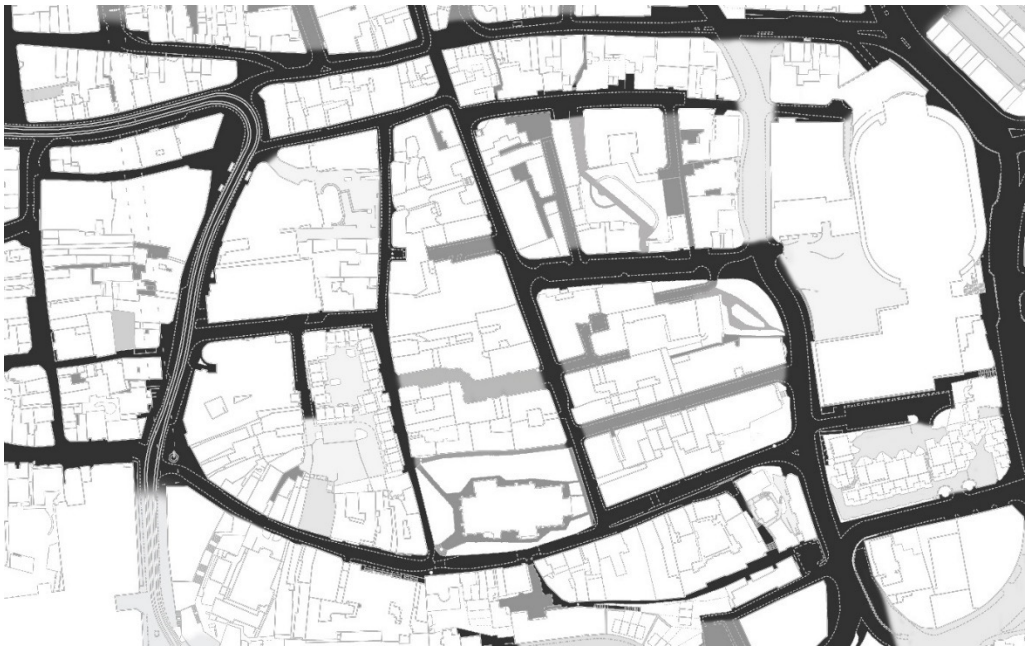


Figure 25. Route persistences.

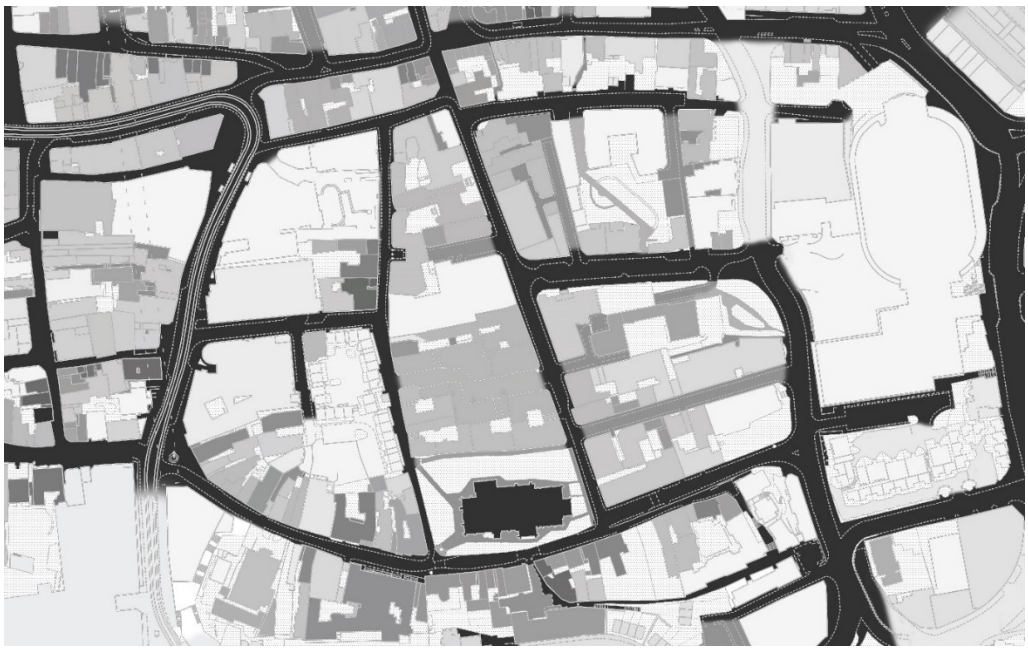


Figure 26. Composite persistence drawing.

Buildings within Nottingham's Lace Market are largely Georgian or Victorian but fit into a street pattern and plot sizes dictated by ancient spans of timber.

PREDICTING THE FUTURE: PRACTICAL APPLICATIONS

This analysis of architecture's capacity to embody and playback the narratives of those involved in a building's construction, use and adaptation raises a question: how can architecture be built with the capacity to record our own histories? Though initial storylines and atmospheres can be created using relatively conventional means, can the route a building takes on the proposed circle of narrativity be predicted, allowing initial 'applied' narrativity to direct 'incidental' change and growth? "*Might that be the measure of the project's intelligence: its capacity to absorb unanticipated effects and benefit from the result?*" (Leatherbarrow, 2021: 6).

While much has been written about 'appropriate' ways to adapt old buildings, predictions of the weathering and erosion of buildings through time appears less common, though still precedented. An early example of a designer's consciousness of entropy can be found in Joseph Gandy's 1830 painting of John Soane's Bank of England in ruins, standing as a monument to the might of the British Empire in a distant, future world where the "*City of London is imagined as a swampy wilderness, as desolate as the Roman Forum in the dark ages*" (Woodward, 2006). The painting illustrates Soane's intentions for his building as a receptacle for a directed form of incidental narrativity across time. A century later, Albert Speer, tasked with designing structures that would outlive the 'Thousand Year Reich', revisited these themes in 'A Theory of Ruin Value', arguing that "*buildings of modern construction were poorly suited to form that 'bridge of tradition' to future generations which Hitler was calling for*" (Speer, 1995: 97). Illustrating his theory through drawings of his work "*after generations of neglect, over-grown with ivy, its columns fallen, the walls crumbling here and there, but the outlines still clearly recognizable*" (Speer, 1995: 98), Speer proposed that future public buildings of the Reich should be constructed using solid stone masonry, the aim being to steer the ravages of time into creating appropriately 'heroic' monuments.

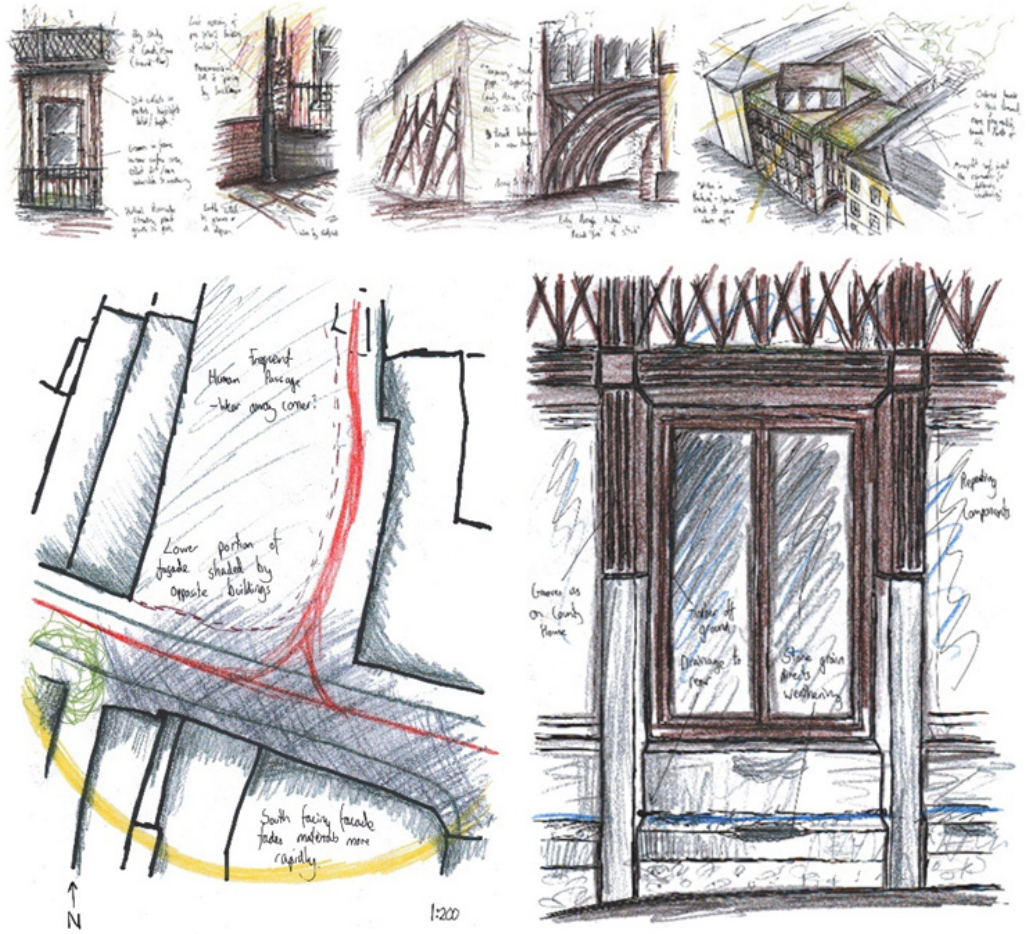
While both Soane and Speer utilised forms of classicism as a means of legitimising their respective societies as the heirs to Roman might, their consideration of the

material qualities employed have wider practical applications for new works. Though taken to an extreme in total ruination, the material specifications chosen at the time of construction are crucial to how the building will fare through time. In a phenomenological reading, so-called 'natural' materials "*allow the gaze to penetrate their surfaces and they enable us to become convinced of the veracity of matter. Natural material expresses its age and history as well as the tale of its birth and human use. The patina of wear adds the enriching experience of time; matter exists in the continuum of time. But the materials of today – sheets of glass, enamelled metal and synthetic materials – present their unyielding surfaces to the eye without conveying anything of their material essence or age*" (Pallasmaa, 1994: 29). Advocating "*materials and surfaces that speak pleasurably of time*" (Pallasmaa, 2000: 79), Pallasmaa goes on to note the primal knowledge of stone speaking of its ancient origins and its durability symbolising permanence, the manner in which exposed metalwork records the passing of history in its collecting of patina, timber recording its duality as both a growing tree and as a crafted object, and brick and its inherent suggested construction. These are materials where the tool marks of their creators, in the carving of wood or stone, or the moulding, carving and joining of brick, can be read, each recording "*an extension and specialisation of the [craftsman's] hand that alters the hand's natural powers and capacities*" (Pallasmaa, 2009: 47-48) that is subconsciously mentally mimicked by observers. These can, perhaps, be considered materials that naturally lend themselves to embodying both applied and incidental narrativity.

The SPAB also note that specific materials "*such as stone and timber, which can be used and enjoyed for their lively surface, character and colour, tend to weather satisfactorily, enduring well and looking better as they age*" (Hunt and Boyd, 2017: 90-1). Taking a step beyond simply praising the characteristics of different materials, the society urge caution at the design stage, noting that "*the way timber cladding is affected by the weather can be markedly different on north and south elevations*" (Hunt and Boyd, 2017: 90-1). Contrary to convention, why should this be considered negatively? The varying responses in material qualities depending on their articulation can be celebrated as part of an architecture unbreakably linked to the unique details of climate, orientation, exposure and human use of its site.

Leatherbarrow speaks of material usage in stages: that of pre-qualification (the inherent characteristics and strengths of a material); qualification (the manner in which they are assembled and located in a design); and re-qualification (the effects of weathering and aging) (Leatherbarrow, 2021: 10). While these phases can readily be mapped onto a model of applied and incidental narrativity, considering and altering the 'qualification' of materials contrary to their 'pre-qualification' may produce interesting results at the level of a building's components. Using a stone block as a case study, Leatherbarrow describes how in construction using load-bearing stone "*it was discovered that stones should not be placed vertically on their sides, with the grain pointing upward, but horizontally, in order to prevent pressure from the load above from cracking the stone*" (Leatherbarrow, 2021: 36-9), a legacy of the block's natural arrangement in a quarry face. While it is acknowledged that "*the placement of stone in construction recalls the stone's origins in cutting and anticipates its aging in weathering*" (Leatherbarrow, 2021: 36-9), the implication is that a contemporary architect, potentially freed from using stone in a load-bearing capacity, can alter the way an individual block will weather and adapt over time to its surroundings by specifying counterintuitive orientations. The organic, incidental narrative of a building could theoretically be predicted and fine-tuned at the time of its construction to a high degree of detail (Figures 27-29).

Figures 27. Sketch models of benches to be incorporated into a South-facing façade, with the unconventional orientation of stonework allowing weathering and erosion to be predicted and directed. This analysis of architecture's capacity to embody and play back the narratives of those involved in a building's construction, use and adaptation raises a question: how can architecture be built with the capacity to record our own histories?



Figures 28. Illustrated here are initial designs for a south-facing façade in Nottingham's Lace Market, designed to reference historic features of the site as well as to have the potential to record a story of its own.

Figure 29. Site axonometric sketch: Potential exists to embody applied and incidental narrativity at County House, Nottingham.

None of the above is to say that novel materials need be disregarded in 'intelligent' narrative design. Weathering steel, as the name implies, is specifically designed to change in tone and texture as it ages. In one of the few architectural examples given sufficient time to embody 'incidental' narrativity, Eero Saarinen's 1964 John Deere World Headquarters manifests the action of rainwater upon its surface, highlighting details of shelter and exposure. Here, programmatic adaptability and rejection of the Corbusian concept of material purity, its "*volume and colour, as absolute, without the possibility of mistake*" (Mostafavi and Leatherbarrow, 1993: 69), has seen Saarinen's work survive in continual use as a record of its time. 'Harder' materials, less receptive to receiving incidental narrativity, may provide relief from the aging that surrounds them, or direct imprints to be made on other building elements. Considered material usage can allow "*a domicile for the touch of our bodies, memories and dreams*" (Pallasmaa, 2009: 102), altering the sounds, textures, smells and appearances of spaces through time by providing the conditions in which phenomenological temporal links can develop. Rich in applied narrativity, the Museum of Scotland has been subject to a financial battle regarding its poor ability to last through time, largely "*blamed on Benson & Forsyth's adherence to the purist modernist doctrine that all visible walls should be sheer and uncompromised by copings*" (Spring, 2007). Resultant water damage causes conservation issues and raises maintenance costs, while the untreated 'natural' sandstone flooring, recording human activity through "*ingrained dirt and abrasion from visitors' shoes*" (Spring, 2007), has proved problematic, resulting in water damage to exhibits during necessary cleaning. Though this may have been acceptable in other areas of the building, it is clear that the programmatic aspects of a space must be considered.

Designs which are readily adaptable will be most likely to survive. Logic dictates that historic buildings still in meaningful use are, "*by definition, survivors, and one important reason for survival is the fact that… [structures] assembled from small components of long-available materials… and with relatively short-span[s]… have proved to be adaptable and resilient. Modern long-span buildings, rigidly structured in non-traditional materials, have shown themselves to be rather less so*" (Earl, 2003: 92). It would, however, be a fallacy of survival bias to suggest that this provides a guarantee of a building's future persistence: statistically, many more short-span buildings have been destroyed over time, while long-span structures have had relatively little time to prove their worth in a consumer society with an age-based assessment of a building's significance, making the adaptation of 20th Century buildings less likely. An appropriate exercise may involve testing different functions against the essentials of a building's plan, without damaging the identity of the building's 'type' (Rossi, 1982).

Building for the long-term and accepting future adaptation is surely a more economically and environmentally sustainable model of building than the design of structures of limited use and lifespan. The conventional contemporary lifespan of a modern building of around sixty years, symptomatic of a society without respect for their position in future history and accustomed to replaceability, could be vastly extended: through early investment against the cost pressure that "*means that buildings are constructed so as to only fulfil their current purpose*" (Piffaretti, 2007); as well as designing to avoid or allow the replacement of "*modern building materials like insulation products [or plastic adhesives with unpredictable lifespans, which] don't last as long as wood and stone*" (Piffaretti, 2007). The principles of designing for adaptable structural systems that can accept the damage of history as a means to 'gather narrative' can also be applied to building services, with simple, passive strategies based on solar and climatical constants seeming preferable to 'high-tech' systems, which rapidly

become obsolete (and may prove impossible to alter without the destruction of a building's fabric). In this way, a building not only increases its efficiency but becomes attuned to the narratives of its site, linked to the movements of the sun and weather systems, as well as Leatherbarrow's times of the 'body' and of the 'world'. Designing around other relative constants, such as human proportions, desires and actions, will aid in increasing a building's potential for 'narrative mass', the peak of 'story-ness' that it can embody. Where these constants are concerned, even in the adaptation of old buildings, "*temporary arrangements [should be] avoided wherever possible and preference given to good permanent solutions that will serve for the long term*" (Hunt and Boyd, 2017: 136) so as to nurture the potential for human 'dwelling' to be recorded.

DESIGNING FOR NARRATIVITY

The principles of designing for applied and incidental narrativity outlined above formed the framework around which 'Nottingham: City of Literature', a hypothetical new museum and library in Britain's East Midlands, was conceived. A site consisting of two empty plots adjacent to a derelict Georgian mansion (County House) was selected, providing opportunities to develop narrative ideas in new structures, allowing a new applied narrative to be started almost from scratch and to enable the testing of directed weathering and decay. In existing buildings, the creative challenge was that of curating and rationalizing the layers of accumulated alterations and adaptations to form a usable building, without obliterating the history that made County House worth saving. The key to this form of design is to understand that this is not the end of the building's adaptation through time: with good fortune, County House will continue to cycle through time and adaption, gaining more successive layers of applied and incidental narrativity in the future, among which will be its 21st Century adaptations.

As an initial design exercise, attention was given to a small area of the southern façade of the new western wing, closely following Leatherbarrow's ideas of material 'qualification' and 'pre-qualification'. Taking into account the sun-facing orientation of this elevation, a sketch design was developed that incorporated deep timber bays, intended to grey and warp in direct sunlight but to remain relatively pristine in deeper recesses, mounted above stone benches with blocks arranged to weather and erode slowly due to the continuing patterns of human use. Drainage channels were directed to weather in specific areas, while an arched entranceway evoked the forces created by the timber supports fitted to the building between 1931 and 2015 (Figures 27-29).

Over the course of several months, these design sketches developed into a coherent set of drawings for a functional building, but still one based on the cyclical model of applied and incidental narrativity (Figures 30-34). The new museum wing became more civic in character, partially in reference to the severe classicism of neighbouring public buildings but largely to develop an applied narrative of this being, at least in its initial form, a socially prominent building for the city. Importantly, while the new structures clearly follow a language of the 21st Century, speaking of increasing environmental awareness and improved accessibility around the ancient structure and new museum wing (an applied narrative of the building's time of construction), low-tech solutions are used wherever practicable. Rather than relying on complex mechanical systems that will likely become outdated within a relatively short period, passive ventilation, shading and drainage systems route the building within the unique conditions of its site while also prolonging the usable lifespan of the building through making it suitable for future adaptation, a key feature for the potential

gathering of narrativity over time. Internally, structural beams are fitted to the new hall that could potentially be used to add a new floor within the double-height space. While currently in use as a grand exhibition hall, it is pragmatic to envisage a time when different uses may be applied to the space even when these run against the wishes of the original designer, for no building can ever remain entirely unchanged. In another exercise in architectural narrativity, in their final design form the new buildings were largely constructed of architectural salvage, most notably from the nearby Broadmarsh Centre (currently undergoing partial demolition and the total removal of brickwork). This reuse speaks of the sustainable concerns of the current time, as well as allowing the new library to gather the stories of the surrounding city's past, both through its architecture and through its housing of literature. The weathering gathered previously and the building's reconstruction with brickwork panels are both clearly legible, adding other layers of storytelling and recording through time to the design.

Within the existing building the simplification and alteration of contorted circulation routes inevitably resulted in some history being lost, but where this has occurred traces remain to ensure the timeline of County House can be read: a redundant 19th Century staircase is moved from the centre of the old house to the new building, but marks on the walls where it was previously fitted are legible to those who seek it. Wherever possible, damage and decay through time are respected as part of the building's incidental history. Rather than trying to repair or replace collapsed floors, voids through missing floors allow for dynamic double height galleries, spanned by blue-painted timber walkways supported by circular brass columns; a reoccurring design language, denoting 21st Century alterations, that will itself weather through a long-time span. The dimension of time has also been addressed for short-term changes: planting will eventually cover the building's walls, deliberately powdery render will flake off the walls of the inner courtyard revealing the reused brick below, and the sand excavated from caves beneath the site that paves the courtyards will be rearranged day by day as footprints are made and remade.

Figures 30. County House, High Pavement, Nottingham, elevation. The new museum structure repairs the line that was broken in 1931 with the demolition of the home of Henry Kirke-White, while remaining in scale with surrounding ancient structures. The South facade features large sash windows, allowing access to small balconies and mirroring the 1833 ballroom, along with shutters to minimise unwanted solar gains. Guttering directs water to weather in desired paths, creating a design routed specifically in its site.

Figure 31. County House, High Pavement, Nottingham, façade. The southern façade onto High Pavement is designed to accommodate future weathering, with projecting drainage directing staining, encouraging visitors to sit and erode the in-built benches, shutters providing shading to the south-facing glass, provision for planting and wall ties denoting the story of how the brick panels of the nearby Broadmarsh Centre were salvaged and used to construct this new form. The façade is also clearly civic, mediating between the severe National Justice Museum in its restrained detailing and proportions, as well as the Nottingham Contemporary with its vertical brick ribs covering panel joints.

Figure 32. County House's original entrance chamber retains as much of the existing fabric as possible but balances this with the need to make repairs and to rationalize the internal layout. Floor tiles, where damaged, are swapped with travertine replacements formed using crushed brick from nearby demolition works, while traces remain of the timber Victorian staircase, removed and fitted elsewhere. New doors in the place of windows are picked out in brass, as are structural interventions.

Figure 33. County House, model of café. Where areas of structural damage are severe, it would be against the principles of incidental narrativity to inconspicuously restore these spaces. Instead, stabilization works will take place, denoted using brass columns, while the removal of rotten floorboards allows lighting, signage and museum displays to be hung through the remaining joists. Changing levels within the building are resolved by building up the floor height in new timber walkways, with lower levels becoming display areas.

Figure 34. County House, rear courtyard. Buildings are adapted, rather than replaced, wherever possible. A portico fitted to the North of County House provides a secondary entrance from this space, also creating a focal point in an outdoor cinema. This is constructed of the same materials as internal interventions, creating a legible language of 21st Century alteration. The 1931 East wing is extended upwards using concrete cast using fragments of its 1949 appendage.

BUILDING NARRATIVITY: CONCLUSION

"Time is the dimension in which buildings actually come to life: how their shadows and steel engage the days and seasons of the world, how they guide the movements of people and things, and how they project the past into the future, the once-was into the could-be" (Leatherbarrow, 2021: 3).

Despite the best efforts of architects throughout history to build for eternity, forming fitting reminders of their age and world, their narratives and technologies, time waits for no man. Attaching to this storytelling, however, an understanding of the mechanics through which buildings evolve, weather, decay and adapt, and embracing this nature rather than fighting it, prompts an investigation into an intriguing methodology on how we can build for the future. Good design, "*seen as just one phase in a long timeline spanning decades, even centuries*" (McCloud in Hunt and Boyd, 2017: v), will likely eventually become the only tangible reminders of our existences, communicated to future generations in a considered narrative-rich architecture.

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Images

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Genius Logi: Towards the Phenomenology of Gated Community

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Abstract

Gated communities have emerged around the world for a variety of reasons including increased fear of crime, security, prestige, and a desire to be different. In Turkey, gated communities have emerged because of neoliberal policies that promotes high-income segment seeking prestige. Gated communities are constructed not only in metropolitan cities such as Ankara, Istanbul, and Izmir, but also in Anatolia. One of these cities is Aydın. Gated communities in Aydın have a unique infrastructure. They are based on the cooperative process that was widely established after 1950. this study aims to investigate whether there is a meaningful connection between the characteristics of Aydın and the gated communities. In order to determine the phenomenon of place in the city of Aydın, a hermeneutic method was used to interpret information about the location and its spirit and transferred to the table through Norberg Schulz (1976)'s work "Genius Loci: Towards a Phenomenology of Architecture". According to the table, the phenomenon of place is divided into phenomena as image, identity and meaning. The table was designed to analyze the place identity of the city of Aydın and the phenomenon of place.

Keywords: Aydın, Genius Loci, Gated Communities, Place Theory, Sense of Places.

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INTRODUCTION

City making is a presentation of cultural production. The basic human needs of new world understanding have increased the quality of minimum comfort conditions in comparison to the past. In the modern world, housing is produced not only for the basic needs of shelter and protection, but also for expressing status, identity and personal value. While the starting point of gated communities was security, it become a prestige issue. This transformation reduces gated communities to certain forms, materials and technological infrastructure that are disconnected from context and meaning. This study will discuss the relationship between the concept of place and the gated communities in the city of Aydın. The hypothesis of this study is that the gated communities in Aydın do not have spatial arrangements suitable for the spirit of the place. The theory of place at the centre of the discussion is examined phenomenologically through the case of the gated communities in the city of Aydın. Is it possible to create a sense of place in gated community neighbourhood unit based on fear instead of friendship? How has the transformation of the relationship between human, city, life, culture, fear and prestige influenced the sense of place? The answers will be discussed on the city of Aydın by matching the basic concepts of the concept of place in the literature and the basic combinations of gated communities. Aydın is a city in Turkey's Aegean Region, located at the heart of the lower valley of ancient Meander River at a commanding position for the region extending from the uplands of the valley down to the seacoast. The city of Aydın presents an appropriate area for discussing that issue with its historical process, scale and the rapid transformation of neighbourhood units into gated communities.

AIM AND SCOPE

I this study aims to investigate whether there is a meaningful connection between the characteristics of Aydın and the gated communities. In order to determine the phenomenon of place in the city of Aydın, information about the place and the spirit of the place has been interpreted with a hermeneutic method and transferred to the table through Norberg Schulz (1976)'s work "Genius Loci: Towards a Phenomenology of Architecture". According to the table, the phenomenon of place is divided into phenomena as image, identity and meaning. The table was designed to analyse the place identity of Aydın and the phenomenon of place. Is it possible to create a sense of place in gated communities, which are symbols of social segregation? It is important to provide direction to future designs with the answers to these questions. This study includes the gated communities and traditional texture in the city of Aydın. In the study, place features of the city of Aydın are examined. This study contributes to the studies carried out in this field because of providing the context of gated communities.

MATERIAL AND METHOD

The conceptual literature research conducted on gated communities, the gated communities in Aydın categorized as data. Information about place classified using the literature. The spatial equivalence of interchange with the location of gated communities in the city of Aydin was analysed with the hermeneutic method. The method of this study is a scientific method based on understanding and interpreting hermeneutic texts. Wilheim Dilthey, Martin Heidegger, Hans-Georg Gadamer pioneered the use of hermeneutics as a scientific method and its use in practice. It is not possible to accept a single understanding and interpretation method adopted by the hermeneutic theory. There is a lot of parameters for the correct interpretation of a text. The concept of place is not

a mechanical but a spiritual and emotional set of spiritual elements. In order to examine the connection of the gated communities and the sense of place in Aydın, information about the place and the spirit of the place has been classified through the work titled "Genius Loci: Towards a Phenomenology of Architecture" by Norberg Schulz (1976). It was graphically expressed in order to collect data. The table prepared was designed to analyse the place identity of the city of Aydın and the phenomenon of place.

RESTRICTIONS OF THE RESEARCH

In this study, the closed sites in the city of Aydın have been examined through the concept of place. In order to reveal the place phenomenon of the region, it should be investigated in these contexts. However, concepts such as sense of spirit of place are directly related to humans and are also a result of human relations. In this context, due to the covid-19 epidemic during the research period in the region, sufficient data could not be collected in this phase of the research. Since the research was conducted only in the city of Aydın, the results are special. Data is insufficient for general conclusions.

THE PROBLEM OF THE RESEARCH

The compatibility of place theory contexts with gated communities design approaches is discussed. Is it possible to create a sense of place in gated community neighbourhood unit based on fear instead of friendship? How has the transformation of the relationship between human, city, life, culture and meaning for fear and prestige influenced the sense of place? The answers will be discussed on the city of Aydın by matching the basic concepts of place in the literature and the basic combinations of gated communities.

SUB-PROBLEMS OF THE RESEARCH

The core of the debate is to determine whether the concept of gated communities and place have context. The second important subject of the study is the characteristic features of the closed sites in the city of Aydın. It is also the traditional texture of the city of Aydın. Is it possible to change the design criteria for gated communities within the framework of place theory? Can the characteristics of the residences reflecting the Aydın city identity? These questions constitute the sub-problems of the study.

RESEARCH HYPOTHESES

The hypothesis of this study is that the gated communities in Aydın do not have spatial arrangements suitable for the spirit of the place. In general, it is hypothesized that gated communities do not fit into the context of place theory. It has been hypothesized that the gated communities, which emerged from such as fear, urban crime, do not have place identity, place spirit and cultural characteristics.

CONCEPTUAL FRAMEWORK

The decrease in the attraction of the rural areas and the increase in migrations resulted in the failure of many of the individuals coming to the city to directly participate in the urbanization process. This situation led to a rise in insecurity and crime rates in the city. Moreover, as a natural result of the migration movements in cities that were unprepared to meet large population movements, the housing problem emerged. Gated communities have walls, barriers, fences, alarms, security cameras (CCTV) and security guards due to security concerns,

but they also have various social activities such as walking paths, seating areas, bicycle paths in the garden layout arranged as landscape. They also include social facilities such as sauna, gym, swimming pool, cafe, market and hairdresser saloon. The reasons for the emergence of gated communities include cultural, economic and social factors. Fear of crime and insecurity in urban areas are considered to be the main reasons for moving to gated communities in many studies (Carvalho, M., Varkki George, R. & Anthony, K., 1997; Calderia, 2000; Low, 2000: 45-58; Landman, 2002: 1-10; Webster, 2002: 1-41; Ladman 2004: 5; Fabiyi 2004: 380-397). Ellin 1997 and Bala 2018 defines the gated community an architecture of fear, namely fear of the neighbours, fear of theft, fear of living outside the gates. Socio-economic concerns, poverty and presence of lower classes are among the reasons for the emergence of gated communities (Massey and Denton,1993: 340-342; Low, 2000: 45-58; Wilson-Doenges, 2000: 597-611; Roitman, 2005: 1-24; Olusevi, 2006; Mingione, 1996: 1-448; Svampa, 2001: 181-184; Borsdof 2002: 15; Pinto & Rovira 2002: 39-44). While crime and urban fear rates are cited as the reasons for their emergence in Brazil (Carvalho, 1997: 734-768), the reasons for their emergence in Africa are seen as racism and social discrimination (Landman, 2004: 1-16). Many authors have referred to the process of choosing a gated community as an act of voluntary segregation, a conscious act and decision taken by an individual or family, contributing to the process of urban social segregation (Greenstein et al., 2000: 6; Borsdorf 2002: 15; Bala, 2018: 333-357). Researchers such as Wilson-Doenges (2000) have showed that gated communities are not such a safe place to live. On the other hand, it is important to note that although most of the time the bad effects of living in a segregated place, which is not only segregated but poor as well, are highlighted. Living in a segregated but wealthy place like a gated community also has many drawbacks for its residents. There are various names and definitions for gated communities in the literature. Studies have been published in the literature that categorize gated communities. These studies are about the authors' areas of case studies and divided into groups as a result of features such as physical barriers (like walls, fences) of gated communities, security guards, and the privileged environment created by the high-income segment of the society (Table 1).

As the concept of gated communities, The place theory has as wide and deep literature in the discipline of architecture. In addition to physical elements, the environment includes messages, semantic signs, and codes that humans perceive based on their perceptions of the signs and motives of deciphering (Rapaport, 1990: 1-256, Turgay, et al., 2017: 65-66; Danaeinia, 2021: 38-49). Questioning the concept of place phenomenologically, Heidegger defines the concept of place as a site with certain boundaries, using the concepts of "space", "place" and "location". Human beings, who attain meaning to and create memories in the place, develop a sense of belonging (Sharr, 2013: 1-129; Danaeinia, 2021: 38-49; Noormohammadi, 2018: 80-94; Yalçın, et al., 2020: 35). based on Heidegger's thoughts Norberg Schulz (1976), handles the concept of place phenomenologically. While describing the place, he states that an explanation cannot be made without mentioning its spatial data, but the exact answer is not just spatial, either. He divides the place into the concepts of 'character' (identity), 'appearance' (image), 'space' and 'spirit of place'. In addition to the physical properties of the place, the character (identity) has the sense/meaning attributed to the place, which defines the atmosphere and the sense of place. Schulz refers to the fact that the spirit of place occurs in the place independent of its observer because it is natural. He uses the concepts of identification and orientation to explain and perceive the spirit of place. While defining the spirit of place, he uses the concept of Genius Loci, the concept of the ancient Roman belief that every being has a protective spirit. According to Schulz (1980), Genius loci is a phenomenon related to what things or beings

want to be. The combination of the three-dimensional extensional elements of place creates the natural place and man-made place. The man-made place as a figure-ground relationship with natural places arising from a combination of landscape and topography. If the relationship between the figure and the place is lost, the identity of the place will also be lost. David Seamon (1979) is another geographer who tries to explain the place through phenomenology. Micheal De Certeau (1984) attempts to define and explain space and place through daily practices. Robert Hay (1998), discovered that people who grew up with their family members in a fixed place with inherent norms had a strong sense of place.

		Parameters	Names of Typologies
Blakely and Syner's Gated Community Typology	residential areas that offer a better lifestyle for people, and offer many alternatives for high-income segments, which are closed to the outside and separated from the public for security considerations.	**Community feeling (sense of community) Exclusion Customization Stagnation**	Lifestyle (1st precondition-customization/last condition-community feeling) Prestige (1st precondition-stagnation/last condition-customization) Security Zone (1st precondition-exclusion/customization)
Landman's Gated Community Typology	Areas where the passage of normal people staying outside is restricted and blocked by physical barriers by limiting the area belonging to the public.	**Physical barriers**	Security Village (Secure premises) (living space and multi-use) Enclosed Neighbourhoods (living space only)
Burke's Gated Community Typology		**Geographical Position Physical-Social Characters**	Urban security zones Secure apartment complexes Secure suburban estates Secure repost communities Secure rural-residential estates
Grant and Mittelsteadt's Gated Community Typology		**Opportunities Facilities Welfare level Secure appearance Character of spatial textures**	Ornamental gating Walled subdivision Faux-gated entries Partially gated roads Fully gated roads Bounded areas with restricted entry
Caldeira's Gated Community Typology		**customized, enclosed and "monitored" areas for consumption, leisure and work.**	Fortified enclaves
Aalbers's Gated Community Typology		**high security housing estates social groupings isolated from segregated people providing safe modern spaces**	Heaven separated from unsecure
Ellin's Gated Community Typology		**fear of the neighbours, fear of theft, fear of the one living outside the gates.**	architecture of fear, Isolation and Segregation

Table 1. Gated Community Typologies

Individuals, who were mobile and unstable in general, had little attainment of a sense of place. The communication and emotional attachment established between places and people as a result of human experience and the development of this attachment are defined as belonging (Prohansky et.al., 1983: 57-83). There exists a sensory, perceptual and cognitive communication between place and human beings. People collect memories somewhere, touch, feel, sense, and develop a sense of belonging (Hidalgo and Hernandez, 2001: 81). There are numerous studies examining the concepts of place and space in literature (Table 2).

Table 2. The Concept of Place with Different Approach

	Parameters	**Phenomenological approach**
Heidegger's approach	site with certain boundaries with the atmosphere experienced The bond that relates the place to the historical process as a consequence of memories and experiences	Questioning the "space", "place" and "location made sense of and captured by human beings in the environment.
Norberg Schulz's approach	spirit of place lies, by virtue of its being natural, in the place independent of its observer. identification and orientation protective spirit (referring to ancient Roman belief) natural place and man-made place figure-ground relationship landscape and topography	'character' (identity), 'appearance' (image), 'Spirit of the place' (sense/meaning) Genius Loci
David Seamon's approach	movements-activities in daily life The repetition in certain processes in space of bodily movements	a routine sequence is formed in space
Micheal De Certeau's approach	the uncertainty and unpredictability spaces that cannot be experienced and where the element of movement cannot be used lack meaning While the space is produced as a result of the actions on it, place involves empty systems on which such actions take place	daily practices as grammar just like a language dealing with meaning
Robert Hay's approach	In his study, he discovered that while people who grew up with their family members in a fixed place with inherent norms had a strong sense of place, individuals who were mobile and unstable in general had little attainment of a sense of place.	Sense of Place in Development Context cultural context
Hidalgo and Hernandez's approach	certain boundaries, with its positional features	physical features, spatial data and three-dimensional volumes
	The spatial and physical features alone is not sufficient to define and perceive the place. The diversity of meaning and emotions that is associated with that place by individuals and groups. The communication and emotional attachment established between places and people as a result of human experience and the development of this attachment are defined as belonging	

Security, one of the changing features of the place, is the main element of change. The security element, which is found naturally in the place, is reinterpreted within the concept of gated community and its boundaries are recoded for a certain space with physical barriers (Köksal, 2003: 56-78). As a result of the fragmentation that gated community has caused in the public sphere, the features belonging to the public space are attributed to the private space. The formation of the place involves the relationship that people establish with the place, context and sense of belonging. In order to evaluate the gated community in Aydın in the context of place, basic common points of sense of place were analysed hermeneutically from the literature as Table 3.

Table 3. Basic Common Points of Sense of Place

A IMAGE	B IDENTITY (SPACE-CHARACTER-IDENTIFICATION	C SEMANTIC VALUE/ MEANING
SPATIAL FEATURES OF THE MAN-MADE SETTLEMENT INPUTS OF NATURAL PLACE	**LANGUAGE OF FABRIC SPATIAL FEATURES DISTINCTIVE PHYSICAL FEATURES**	**SYMBOLIC VALUES AND ATMOSPHERE THEY REPRESENT**
Concrete Elements topography, mountains, geomorphological structure, flora and fauna, green texture, water element	Material-Texture-colour	Defining Identity
	Construction Technique	Values Affecting Identity
	Formal Structuring	Memory-Recollections
	Scale-Proportion	Symbolic Values -Atmosphere They Represent
	Fabric-Colour	Defining Identity
Order-Cosmic Order	Façade Analysis	Values Affecting Identity
Identity (Spatial Inputs of Climate and Vegetation)	Horizontality-Verticality	Memory- remembrances
Light-Shadow (Sunshine) Analyses	Inside-Outside Relationship	Positioning
Time	Light-Sunshine-Climatic Effects	Organization-(orientation)
Silhouette	Topographic Features	articulation
Settlement-landscape	Silhouette	Symbolic values it represents and the atmosphere
The elements that constitute the identity of the city and the place are shaped and formed around the characteristics of the natural place and the man-made place that are unique to them. These features are the texture, colour rhythm, silhouette formed by the features of the construction elements that comprise the man-made place, as well as the topographic features and seasonal and climatic features of the natural place of the city.		

CASE STUDY AREA

The city of Aydın is located in the Aegean region of Western Turkey. Aydın has characteristics that differ in terms of location from other cities due to its identity and historical and cultural background. The city, which enjoys mild temperatures as a result of the Mediterranean climate, has fertile lands thanks to Meander

River feeding the plain. In addition to its location between two mountains with centuries-old olive trees and fig trees, the city has a special atmosphere, image and appearance. Moreover, the Liberation War, the historical events after and the culture of Efelik (swaggering) are the features that distinguish Aydın from other cities. The city of Aydın was chosen as the study area due to its characteristics reflecting its unique place identity. Examples of civil architecture from the Republican era were accepted as the construction products reflecting the identity of the city of Aydın (Figure 1).

Figure 1. The Current Gated Community Location in Aydın.

Gated communities in Aydın may be considered to have begun with the state-sponsored cooperative buildings. Parallel to the growth and development of the city, immigration and housing problems emerged. This type of state-supported buildings surrounded by walls where the entrance and exit were controlled can be deemed as the beginning of gated communities in the city of Aydın. The gated communities in Aydın did not have different types and various features as mentioned in the literature. However, it was found that they had physical barriers, separated from the public with security measures, and some had specialized activities and social spaces for leisure time. Gated communities with the above-mentioned features constitute the study area within the scope of the study (Figure 2).

A-Image (Natural Place-Man-Made Place); When the climatic data of the Aydın examined, it is seen that the Mediterranean climate causes high temperatures in summer and a mild weather in winter. This leads to the formation of extensional elements of the natural place such as evergreen oak and pine trees, olive and fig trees and various citrus trees. It also gives rise to such? as the courtyard in traditional construction products and the presence of large balconies in modern construction products. Oak, pine, olive and fig trees, which constitute the plant and tree elements of the natural place, are important elements that form the identity of the city. They not only create the natural place of the city they are also one of the basic elements of the image that constitutes the city's identity. The spatial setting of the structural elements on the regular grid settlement of the man-made place, is one of the most important facts suggesting that the city of Aydın was constructed with an order of openness in mind. According to the information given in the Table 4, it has been observed that the natural place of Aydın has a unique character, fabric and identity, and these elements have affected the urbanites with the spatial characteristics of the man-made place in the historical process. The spatial characteristics of the physical environment have been affected by the natural place inputs, and this effect has gradually

been replaced by the elements of modern architecture. Therefore, the spatial settlement features of the man-made place cannot be explained around a single fact or feature; it has a complex image with many features and elements.

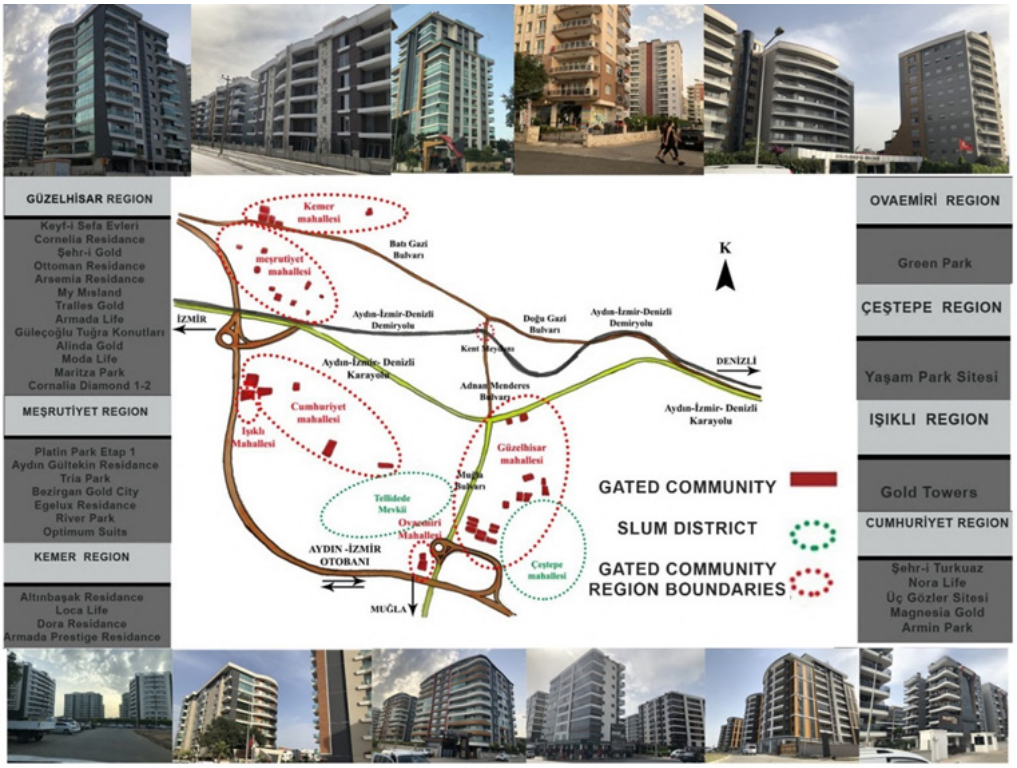


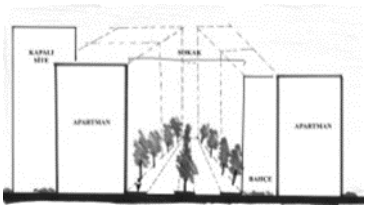
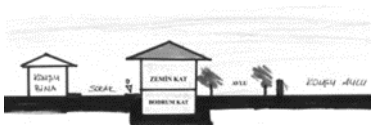
Figure 2. The Current Gated Community Location in Aydın

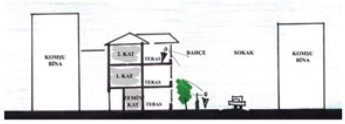
Table 4. A-IMAGE Table of the Place Analysis of the City of Aydın

IMAGE		
SPATIAL FEATURES OF THE MAN-MADE SETTLEMENT		INPUTS OF NATURAL PLACE (Landscape)
CONCRETE ELEMENTS (topography, mountains, geomorphological structure, flora and fauna, vegetation, water bodies	• Republican era buildings • Modern buildings • The main centerlines and roads that make up the urban fabric of the city, which has a grid plan • Ottoman period religious buildings	• Aydın Mountain, Menteşe Mountain • Oak, Pine, Olive, Fig, Cotton • The Büyük Menderes River • Fertile land
ORDER-cosmic order	• Grid plan plane, slum plan plane	• Naturally formed cosmic order
IDENTITY (Spatial inputs of climate and vegetation)	• Architectural identity of the traditional construction products • Architectural identity of the modern construction products	• Fertile land • The openness caused by the climatic feature
LANDSCAPE	• Buildings with modern architectural style, traditional construction products of Aydın city, slum buildings	• Vegetation and olive and fig trees accompanying the forest texture consisting of oak and pine trees
SILHOUETTE		

B-Identity (Character-Space-Identity); Since the concept of identity is directly influenced by human and natural place, it contains many components. The man-made place of gated communities differs from the traditional construction products of the city of Aydın. The gated communities and modern housing construction products are multi-story buildings in contrast to the traditional context in Aydın. Traditionally built environment in Aydın has an image and identity with proportions close to the human scale, emphasizing the element of horizontality rather than verticality. However, the gated communities in the city of Aydın are high-rise and their plans are designed to emphasize their verticality. The courtyard, found in traditional construction products in gated communities, has been replaced by large balconies and landscaping with specialized functions for the residents of gated communities. The courtyard, which is found in the traditional construction products of the city of Aydın, is a spatial element designed to create a special area of privacy for residents. Since the public space is open to use by people from all walks of life, the courtyard is designed as a transition space to the private space that the users have created for themselves and is a semi-private-semi-public space. The area of privacy has been created with the separation of the public and private spaces by the courtyard wall, and it can also be argued that traditional residences have the advantage of being closed to the outside. Although the concept of closedness is not rigid in traditional houses, the phenomenon of closedness-openness has been emphasized with transition spaces. The proportions in traditional construction products are close to the human scale and have an atmosphere that does not exclude the human element, but rather embrace it. The courtyard, which is found in traditional construction products, can be regarded as a component of the climate that prevails in the city. The identity of the place includes the geographical and human characteristics provided by its location, its general spatial and steric structuring, and the elements of characteristic articulation (Table 5).

Table 5. B- IDENTITY (Space-Character- Identification) Table of the Place Analysis of the City of Aydın

IDENTITY (Space-Character- Identification)		
Language of Fabric	Spatial Features	Distinctive Physical Features
	Gated Communities in Aydın	Traditional Man-Made Place in Aydın
MATERIAL	• Concrete • Aluminium-iron • Precast concrete panel • Glass cladding	• Stone • Brick • Iron • Wood
CONSTRUCTION TECHNIQUE	• Reinforced concrete	
FORMAL STRUCTURING	• Garden with various functions and common areas with landscape arrangements • Having private areas in residential and apartment buildings • Spatial designs unlike the Turkish house plan • Wet areas inside the house • The buildings located parallel to the corners and sides of the plot.	• Court yarded • No specialized space • Plan type with a hall • Having an oriel window • Wet areas outside the house • The buildings located in the corner of the plot
SCALE-PROPORTION		

FABRIC-COLOR	• Solid textural ground: residential areas, sports grounds, pedestrian ways and driveways. • Smooth textural ground: Soil areas, water bodies, plants, trees	• Solid textural ground: residential area, courtyard ground • Smooth textural ground: garden area located in the courtyard, plants, trees
FAÇADE ANALYSIS	• Casing decorations around window openings • Joint decoration element made on the facade • Decoration items made with modern materials that show the floor level at the bottom and top dimensions of the balcony • Vertical decoration elements made with modern materials that emphasize the verticality of the facades. • Floor-height window openings • Balcony railings made of glass material • Silicone glass cladding that completely covers a part of the façade vertically or horizontally.	• Plaster decorations around window openings • Rectangular panels • Plasters made of gypsum material in the facade corners • Grooved decoration elements made of plaster along the floor level • Grooved decorations with gypsum material that connects by following the window decorations along the facade • Decorative balcony and window railings made of iron material
HORIZONTALITY-VERTICALITY	• Vertical extension with high number of floors	• Single or two-storey horizontal extension
INSIDE-OUTSIDE RELATIONSHIP	• The garden with landscape arrangement being both a public and a private space-openness feature • Garden walls, barriers-used for separation from the public indicating closedness • Efforts of openness-closedness features to exist by destroying each other	• Soft and layered transition with the an iwan arrangement and entrance into the building through courtyard, which is a semi-private-semi-public space, • Use of closedness-openness features without destroying each other
LIGHT-SUNSHINE-SEASONS AND CLIMATIC EFFECTS	• Large balconies • Built-up roof	• Court yarded building • Smaller window openings • Curb roof • Plant fabric in the residential garden
BUILDING OUTDOOR RELATION	 street-building relation in Aydın context	 street-building relation in gated communities

C- Semantic Value of the City Sense (Genius Loci-Spirit); The city's sense of place involves its existential roots, its identity in the historical process, the symbolic values it represents and the memory of the city. it can be argued for Aydın that the traditional architecture that constitutes the urban identity have become symbolic values of enlightenment, rebirth and identification in the city that were reconstructed after the Liberation War. The works of the Republican period, which constituted the traditional architecture of the city, were structures that had a Turkish house plan and were built with the architectural building materials of the period. The identity of the traditional fabric bears characteristics such as the plan features of the Turkish house conveyed through the experiences and practices of the Anatolian people. The values that affect the identity can be considered as both spiritual and physical characteristics such as the architectural understanding of the Republican period. The symbolic values of the gated communities in the city of Aydın involve prestige, security, social segregation

and differentiation, which are parallel to the reasons for their emergence in the world. Given that gated communities arose with security concerns, factors such as crimes in the city, urban fear, and crime rates in urban areas and regions that cannot coexist with the city have a direct impact on their identity. They can be considered to lack urban memory and individual memories accumulated there (Table 6).

Table 6. Semantic Value of the City of Aydın

SEMANTIC VALUE		
	Gated Communities in Aydın	Traditional Architecture in Aydın
SYMBOLIC VALUES AND ATMOSPHERE THEY REPRESENT	Prestige Security Social Segregation and Differentiation Privilege	Traditionality New-Modern Outlook Enlightenment Reconstruction
DEFINING IDENTITY	Prestige Privileged Life Sense of Security	Traditionality Reconstruction Republic
VALUES AFFECTING IDENTITY	Insecurity Rising Crime Rates Urban Fear Prestige Privileged Life	Republic Turkish House Plan Features Occupation and Destruction Reconstruction Enlightenment-Liberation
MEMORY-RECOLLECTIONS	No memory values No belonging Any semantic construction	Liberation War Occupation-Destruction Proclamation of the Republic Enlightenment-Liberation Traditionality

DISCUSSION

Although the concept of place is spiritual and emotional rather than mechanical, the main parameters are defined as image, identity and semantic value. To discuss about the theory of place within the context of gated community is quite difficult since the ontology of these two phenomena is opposite. Literature review of gated community -whatever the names of typologies- based on security (walls, barriers, fences, alarms, security cameras (CCTV), security guards) (Blake and Snyder, 1997: 1-208; Massey, D., & Denton, N., 1993: 340-342; Low, 2000: 45-58; Wilson-Doenges, 2000: 597-611; Roitman, 2005: 1-24) and social opportunities (sauna, gym, swimming pool, cafe, market, hairdresser, walking paths, seating areas, bicycle paths in the garden layout arranged as landscape). Having security without fear of crime and social facilities in a house environment seems to advantage. However, living in a gated community means voluntary segregation and isolation. The fear of those who live outside the gates prevents to get the spirit of the place which requires not only three dimensional natural and man-made components but also perceptual, cognitive memories. Gated communities in Aydın are analysed in terms of the parameters of image, identity and semantic value as follows;

Image: Aydın's natural environment has a mild climate, many days, fertile soil, fauna consisting of pine, oak, olive and fig trees, and has the image of Meander River. The built environment of Aydın has the image of Republican period civil architecture, single or two-store residences, cooperative structures that can be called first gated communities, apartments, modern gated communities. While it has a zoned grid-planned settlement in the central part of the city, it has increasingly scattered, non-linear streets and closed sites on the peripheries. As a result of the fragmentation that gated community has caused in the public sphere, the image of Aydın has been damaged by gated communities.

Identity: The construction elements that have survived to the present day and reflect the city's place identity have been examples of Republican period civil architecture. Aydin's identity is defined by the spatial, structural and functional characteristics of Turkish residential architecture. The building materials in the construction products that define the identity of Aydın are natural materials such as brick and cut stone. This situation gives rise to an appearance that creates a feeling to touch the facade of the building. Besides highlighting the fabric identity of the city, it is thought that these facades were also influenced by the Hungarian masters who visited the region. Plaster ornaments in the window openings, rectangular panels accompanying the plaster texture in some buildings and flower motifs on the panels are characteristic elements in the facades of these buildings. In addition, plasters positioned at the corners of the building facade and grooved plaster decorations following the floor alignment along the facade are the basic elements of the facades. the identity of residential areas with smooth and solid grounds is in harmony and integration with traditional construction products. The courtyard, which is found in the traditional construction products of the city of Aydın, is a spatial element designed to create a special area of privacy for residents. The area of privacy has been created with the separation of the public and private spaces by the courtyard wall. Although the concept of closedness in traditional houses is not rigid, the phenomenon of closedness-openness has been emphasized with transition spaces (courtyard, iwan). Traditional construction products have the Turkish house plan type and are generally single or two-storeyed. They are closer to the human scale with their single or double-storey appearance. The gated communities, which are the main components of the man-made place and the subject of this study, differ from the traditional construction products of the city of Aydın in terms of their general appearance and image. and identity of the gated communities are different from the traditional fabric. The concept of private space and its reflection on the housing space have emerged with modernization and the historical process. While there are private spaces for users in the spatial structuring of the gated communities, which are among the modern housing construction products, wet areas are designed inside the house. In addition, gated communities are located parallel to the edge of the building plot or have forms compatible with them. As modern housing construction products, gated communities have many different elements of fabric including reinforced concrete, soil and sometimes water. The earth ground around these spaces, trees and the water element form a smooth textural ground in some gated communities. Both forms of texture are not always in harmony and integration with gated communities that have different designs. The courtyard, which is found in traditional construction products in gated communities, has been replaced by large balconies and landscaping with specialized functions for the residents of gated communities. Having landscaping arrangements that are open to the use of all gated community residents, these spaces do not offer privacy for all users, but are used by a certain group and have a public nature. This situation in gated communities also disrupts the openness-closedness relationship. The gated communities, which are modern housing construction products, are multi-floor buildings. The gated communities in the city of Aydın are also high-rise and their plans are designed to emphasize their verticality. It can be seen in the visuals with traditional construction products below that the city has an image and identity with proportions close to the human scale, emphasizing the element of horizontality rather than verticality. The gated communities in the city, on the other hand, have a form far from the human scale with their high-rise appearance (Figure 3).

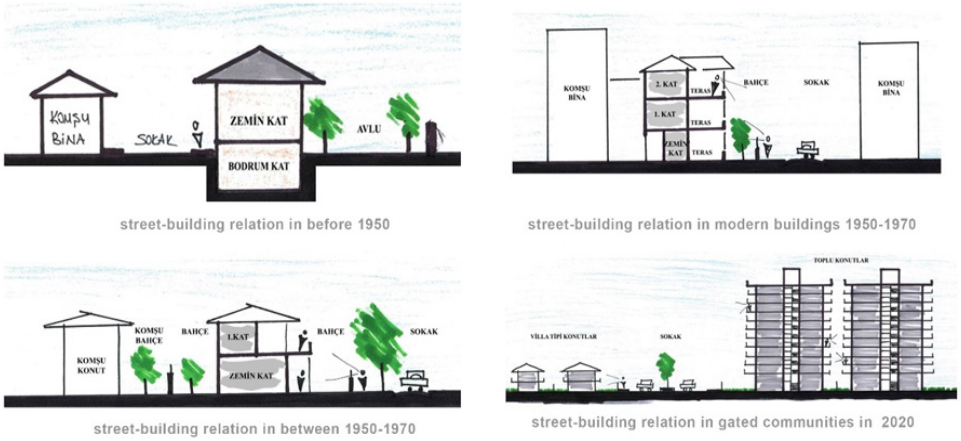


Figure 3. The Changes of Street-Building Relation and Scale (produced by Özlem Yıldız)

Semantic Value of the Sense of City (Genius Loci- Spirit): Traditional structures have essential and unique meanings for the city of Aydın due to its historical and cultural background. In the city, the works of the Republican period are the symbols of enlightenment and reconstruction. The symbolic values of the gated communities in the city of Aydın involve prestige, security, social segregation and differentiation, which are parallel to the reasons for their emergence in the world. The gated communities in the city have an atmosphere that reinforces the attraction of being different, encourages this life, and the concept of prestige is felt strongly. The prerequisites for the values represented by gated communities can be cited as prestige, distinction, separation, and a privileged life style. Due to the fact that gated communities have representation values such as prestige and security in the world and in our country) (Blake and Snyder, 1997: 1-208; Massey, D., & Denton, N., 1993: 340-342; Low, 2000: 45-58; Wilson-Doenges, 2000: 597-611; Roitman, 2005: 1-24) prestige, trust and privileged life are interpreted as the defining elements of this housing type. The gated communities in the city of Aydın are privileged and prestigious living spaces with their place identities and safe spaces. Reasons such as social and psychological separation between low- and high-income people, rising demand for luxury and prestige, and increasing insecurity in urban areas directly affect the identity values of gated communities in the city (Low, 2000: 45-58 Roitman, 2005: 1-24; Carvalho, 1997: 734-768). Considering that gated communities emerged with security concerns, reasons such as crimes in the city, urban fear and crime rates in urban areas and regions that cannot coexist with the city have a direct impact on their identity. Since the gated communities, which are the symbols of the privileged life in the city, do not have features that make up the city and cause the development of sense and belonging, they can be considered to lack urban memory and personal memories accumulated there. Independent of the atmospheric spirit of the place, the atmospheric effect provided by their own identity values is felt in the safe space they provide with walls, and this effect is transferred to the whole of the city either incompletely or in a way that is incompatible with the city's norms (Schulz,1976: 5-202). The gated communities in the city of Aydın have an identity different from the identity values of the city of Aydın. The gated communities, which are symbols of privileged life, are construction products designed not to establish a context in the place but to allow their users to develop a context and a sense of belonging within their own safe space. They are intended to have individuals develop a sense of belonging and orientation through the spaces with diverse functions designed within the "safe" area surrounded by barriers and walls. These spaces, which lack historical context, recollections-reminiscences and urban memory contain differences from the spirit and meaning of the city of Aydın with their semantic values.

CONCLUSION

The conceptual literature research about place and Genius Loci: Towards a Phenomenology of Architecture written by Norberg Schulz (1976) analysed through the hermeneutic method. Aydın was chosen as the study area because of its features reflecting its unique spatial identity, as well as the gated communities that have been built rapidly in parallel with the growth of the city. As a result of this study;

- While gated communities in Aydın have semantic values such as prestige, security, social separation and differentiation, the identity has semantic values such as re-enlightenment and tradition. For this reason, it has been determined that gated communities in the city do not coincide with the sense of place and the spirit of the city.
- It has been determined that gated communities and traditional fabric have different characteristics in terms of semantic values, defining identities, values they represent and the symbolic elements in the case of Aydın.
- The features that gated communities have changed regarding the place are as follows: Security, Semi-public and-semi private spaces, social relations (neighbourhood), Place Attachment, The character of the place, Human identity, Urban identity, Cultural identity.
- Also, the detachment, replacement or transformation of these elements, which are involved in the formation of the place, at the same time dissociate the place from meaning. Therefore, gated communities can be considered non-places. The gated communities that affect the character, identity and semantic value of the place also make changes and transformations in the identity, cultural and semantic values of the city of Aydın.

SUGGESTIONS

Within the scope of the study, it was investigated whether there is a context between the gated communities in the city of Aydın and the theory of place. According to the research, it has been concluded that gated communities can be described as non-places. A contribution has been made to future designs that respect the place theory. According to the results obtained from this study;

- Less floor height should be preferred in closed site designs in Aydın city.
- Housing designs should be made in accordance with the place property for each city.
- Design elements such as exterior decorations, large balconies should be used to help gated communities establish their relationship with people and the context of the place.
- Cultural features, urban identity and the spirit of the place should not be neglected in housing designs.
- The structure of gated communities that causes social segregation can be replaced with designs that are compatible with the theory of place.

Conflict of Interest
No conflict of interest was declared by the authors.

Authors' Contributions
The authors contributed equally to the study.

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Works of Art in the Turkish Grain Board (TMO) General Directorate Building

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Abstract

Turkish Grain Board (TMO) General Directorate Building was designed by Vedat Özsan, Cengiz Bektaş and Oral Vural (Özsan-Bektaş-Vural Architects) in 1964 and constructed between 1964 and 1968 in Ankara. One of the significant aspects of the building is the involvement of works of art. One percent of the building cost was allocated to the works of art. Moreover, the architects get inspired by some artists during the building design. Such kind of art and architecture synthesis was common in modern architecture between 1950 and 1980 both in Turkey and in the world. However, this aspect of the TMO building is not known enough in the literature. The aim of this study is to analyze the works of art in TMO General Directorate building in terms of art and architecture synthesis. The research method was mainly based on the analysis of the building on site and the evaluations of existing artworks with the literature about art and architecture synthesis, individual writings of architect Cengiz Bektaş and some artists (Bedri Rahmi Eyüboğlu, Burhan Alkar etc.). These works of art vary from wall ceramic to stained glass, and after 1988, a monumental sculpture was added to the building via competition. Moreover, after this sculptor competition, TMO established a plastic arts application center in 1989.

Keywords: Art and Architecture Synthesis, Modern Architecture, Turkish Grain Board (TMO), Cengiz Bektaş, Bedri Rahmi Eyüboğlu.

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INTRODUCTION

Turkish Grain Board (TMO) was established in 1938 in order to support farmers and consumers, and its first settlement was in Sıhhiye in Ankara. While the institution and Ankara were growing, it was decided to build a new building for the general directorate in the ministries area in Kızılay. The new land was in the corner of Milli Müdafa Street and Kumrular Street. Hence, TMO organized an architectural competition for this general directorate building in 1964. A project, designed by Vedat Özsan, Cengiz Bektaş and Oral Vural (Özsan-Bektas-Vural Architects), won the competition. The construction of the building completed and opened in 1968. TMO General Directorate Building is one of the significant modern buildings of the 1960-1970 period for the architectural history of Ankara and Turkey. It is a significant example of buildings whose every detail was designed by architects from urban scale to every furniture details. It is also a pioneering building in which some innovations were applied for the first time in Turkey, from new construction techniques to flexible function solutions. Moreover, as Özsan et al. (1968) stated, one percent of the building cost was reserved for works of art, and the building was decorated with these works of art.

It is known that "art and architecture synthesis" was common in modern architecture between 1950 and 1980 both in Turkey and in the world. In the literature, the most mentioned example of the synthesis of art and architecture seen in Turkey is the Istanbul Manifaturacılar Çarşısı (İMÇ) building, which was completed between 1959 and 1966. In addition, the buildings of Vakko Factory, Divan Hotel, Marmara Hotel, Ankara Ulus Business Han, Anafartalar Bazaar, Hacettepe University Children's Hospital and Büyük Efes Hotel İzmir are among the known examples of architecture and art synthesis (Bozdoğan, 2008; Yavuz, 2008; Erkol, 2009). Since the interior spaces of these buildings, which are open to the public and have functions such as hotels, bazaars and hospitals, are widely recognized, they have been able to taken place in the literature with their works of art. However, this feature of the TMO General Directorate building is remained hidden and could not be included in the literature comprehensively.

The aim of this study is to analyse the works of art in TMO General Directorate building in terms of art and architecture synthesis. The research method was mainly based on the analysis of the building on site and the evaluations of existing artworks with the literature about art and architecture synthesis, individual writings of architect Cengiz Bektaş and some artists (Bedri Rahmi Eyüboğlu, Burhan Alkar etc.). The steps of the research could be summarized as follows: 1) all the existing art works in the building were found and documented, 2) they were examined in terms of their position and function in the space, 3) their visual narratives were examined in terms of the mission of TMO, 4) its architects' writings and open achieves were examined in the focus of TMO building, 5) the artworks of the similar buildings designed in the same periods were scanned in the literature and compared with the ones in the TMO building.

ART AND ARCHITECTURE SYNTHESIS BETWEEN 1950S AND 1970S

The cooperation of artists and architects in building design was a trend that spread to the world in the 1950s. According to Erkol's (2009) statement, modern architecture, which became anonymous and ordinary after the transition to rapid production after World War II, began to be criticized aesthetically and socially, and the synthesis of art and architecture emerged as a tendency. Bozdoğan (2008) stated that the synthesis of art and architecture offered a creative solution in those years for young architects of Turkey and similar countries, who were caught between their belief in international modernism on the one hand and their search for national identity on the other. It was

effective in "nationalizing modernism". Yavuz (2008) expressed this synthesis as the integration of a universalized modernist architecture with works of art, that contain folkloric elements and have traces from the local. While all techniques were rapidly becoming universal, emotions became national. Bozdoğan (2008) defined this synthesis as an attempt to give life to modernist spaces, that were thought to have been sterilized until then, with sculptures, wall panels and paintings.

In the architectural literature of this period, some buildings were written with their art works as well as their architecture. In the example of Büyük Efes Hotel İzmir, designed by Paul Bonatz and Fatih Uran, the construction was completed in March 1964 and the decoration and furnishing works were completed towards the autumn of the same year. The building was published as a paper in Arkitekt (Bonatz and Uran,1965) and a list of works of arts and their artist were also written. The main subtitles of this list were artistic oil paintings, moulage works, artistic glass mosaic works, artistic ceramic works, artistic glass works, artistic copper works (Bonatz and Uran,1965). Unfortunately, such kind of information could not be found about the artworks in the TMO building, neither in 1968 nor in the following periods. Therefore, questions related to the total number of artworks, their qualifications and their artists, remained unanswered in the literature.

There are various theses which focus on artworks in the buildings of this period and analyse comprehensive examples from Turkey. For instance, Tulum Okur (2018) focused on art and architecture synthesis in Turkey from 1950s to 1970s, and she examined 84 buildings. However, TMO building was not written among these buildings. Yavuz (2015) studied the dialogue of architecture with the arts in post-war Turkey, and she attempted to comprehend the formation of the idea of "collaboration" between arts and architecture. In her study, TMO building (with her translation as "Agricultural Products Office Headquarters") was written among the 31 buildings in the list of selected works performed in post-war Turkey. Yavuz (2015) wrote the names of three artists, Erdoğan Ersen, Turan, Erol and Eren Eyüboğlu with the TMO building in the list. Moreover, in her interviews with Cengiz Bektaş and Tural Erol, the TMO building was mentioned in some sentences. However, the information specific to the TMO artworks has remained superficial. Except the monumental sculpture in the garden, only one photograph was found about the artworks in the TMO building in the literature. In the thesis of Can (2018), which focused on ceramic murals in public spaces in Ankara, a photograph from 1978 illustrates a wall ceramic in TMO building and it is written as the work of Erdoğan Ersen. Since these theses were not focusing mainly on the TMO building, the total number of art works, their qualifications and their artists, are still unknown for the TMO building. Özyıldıran's research about the architecture of TMO building was published in 2010 and 2011; however, these publications were not focusing on the artworks of the building. If the TMO artworks could be well examined and documented, the TMO building might be discussed in more detail in the related research studies.

ARCHITECTS' AND ENGINEERS' INTERACTION WITH ARTISTS DURING THE TMO BUILDING DESIGN

In 1959, Cengiz Bektas graduated from Munich Technical University and Oral Vural graduated from İstanbul Technical University. After their graduation both of them worked in architectural offices in Germany. When they returned to Turkey, they first met in the Middle East Technical University (METU) in 1962. They were both working in the construction office of METU. One year later, they left the work at METU and opened their own architectural office with Vedat Özsan called "Özsan-Bektas-Vural Architects". They took part in five architectural project competitions and received awards from all of them. In two of these

competitions, they won the first award and their projects were applied; Turkish Republic Embassy in Bonn and TMO General Directorate building in Ankara. Both competitions were held around 1964 and their constructions completed around 1968. Hence, in the following texts, Embassy in Bonn will be also mentioned.

TMO General Directorate building has the common architectural features of 1960s; its form is made of square planned prisms surrounding a court, and spreading to the land according to its functional needs. Besides its common design approaches of its time, it also pioneered some construction techniques, such as precast façade and open office systems. In this building, architects considered everything from urban analysis to the design of all furniture details. There are hundreds of detail drawings for this building with the signature of Bektas-Vural Architects. They designed every detail of the building sensitively so that some structural solutions for some structural problems (such as insulation, drainage etc.) also looks like works of art (Figure 1).

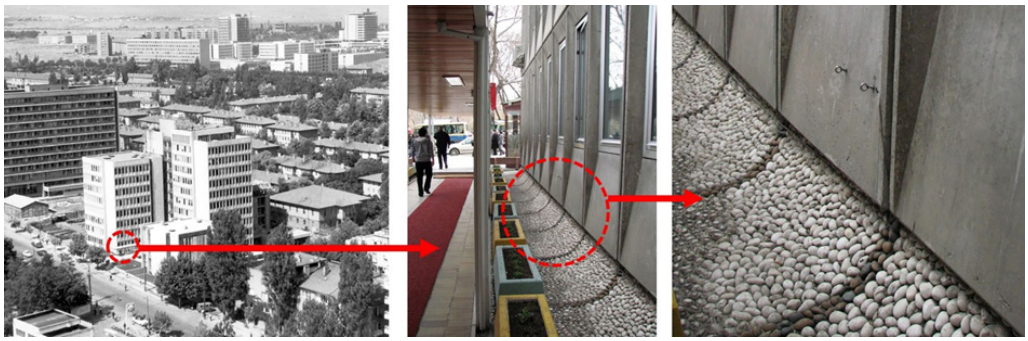

Figure 1. Architects' design considerations from urban design to small structural details for TMO General Directorate building; a) a general view of the building with its closed surroundings in Kızılay (TMO Press and Public Relations Directorate archive), b) a human scale view of the building entrance (Photographed by the author, 2008), c) a detailed view the same façade (Photographed by the author, 2008).

Since TMO building pioneered some construction techniques, such as precast façade and open office systems, the contribution of engineers (civil engineer, mechanical engineer and electrical engineer) also became significant. Moreover, their works corresponded the designs of the architects' inspiration from artists and the expressionist movement. Bektaş (1987) explained how they work together as follows:

"In the work areas there is a cassette ceiling, in the service block there is a beam that looks like Piet Mondrian's paintings. Static engineer Ali Terzibaşoğlu was the only one in his field in Turkey today, whom I respect, love, believe in... With his efforts, wherever there was a current of power, we tried to arrange the beam in its proper place and to show the work it was doing with its thickness and measurements. It was a reflection of the expressionist movement in us" (Bektaş, 1987) (Figure 2).

Figure 2. One of the ceilings of the service block in the TMO General Directorate building; a) general view with the wooden elevator doors and black marble floor (Photographed by the author, 2008), b) a closed view of the same ceiling (Photographed by the author, 2008), c) schematic representation of the beam plan of the same ceiling part (drawn and colored as a Mondrian painting by the author, 2022).

Not only the engineers but also the artists searched innovative techniques in order find compatible solutions with the architects' designs. For the example of the Embassy building in Bonn, Bektaş said:

"We worked with Bedri Rahmi (for the glass blocks of the Bonn Embassy) in

Paşabahçe for two years. They could not cool the 7 cm thick glass here. We were determined to do it. So Bedri Bey went to Germany. He went to a workshop there. A man-made glass coloured by putting something inside the concrete. Bedri Rahmi has a figure with a fruit saddle, which could be used in this technique very well. Then he did it." (SALT, 2020) (Figure 3).

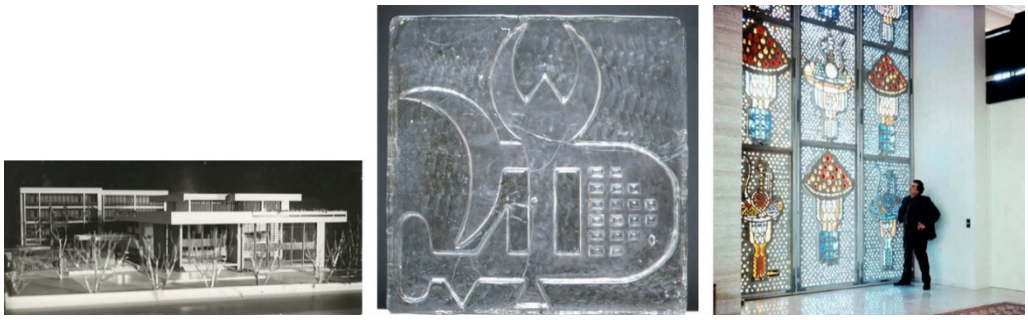

Figure 3. Turkish Republic Embassy in Bonn;
a) scale model of the building (SALT Research, 2019-b),
b) a glass block designed by Bedri Rahmi Eyüboğlu for the building (SALT Research, 2019-b),
c) a stained glass designed by Bedri Rahmi Eyüboğlu for the building (Yazman, D., 2011).

Bektaş explained why he worked with Bedri Rahmi Eyüboğlu so close in his works as follows: "Bedri Rahmi is a person who paints with the motifs of my culture in my country as opposed to the people who try to create Turkish painting by working only with Western techniques" (SALT, 2020). For the TMO building, Bektaş also mentioned the contribution of Bedri Rahmi Eyüboğlu:

"Bedri Rahmi Eyüboğlu added the colours of the interior. From the beginning, I always included artists(painters) in my work... Because I know they love colour more than we do. We architects are afraid of everything. We are especially afraid of colour. Everything is scratched in grey from our cowardice... However, they know how to warm welcome people by using beautiful purples, greens and reds. I believed in the rightness of making use of this long before the post-modernists" (Bektaş, 1987).

Bektaş's (1987) criticism about architects' colourless designs and his support of artists' (painters') contributions to the architecture seem parallel with Bozdoğan's (2008), Yavuz's (2008) and Erkol's (2009) statements about "the art and architecture synthesis between 1950s and 1980s".

WORKS OF ART IN THE BUILDING FROM 1960s

As mentioned above, Özsan et all (1968), stated that one percent of the cost of TMO General Directorate building was allocated to the works of art. However, the details about these art works, such as their numbers, names, their artists etc., were unwritten in the literature. Moreover, there was no accessible written information about them in the archives of the institution. In the site analysis in 2008, five types of works of art were found and photographed in the TMO General Directorate building. These were a wall ceramic in the meeting room, a wall ceramic in the old cafeteria, a wall mosaic with stones in the conference hall foyer, three skylights with stained glass over the conference hall foyer and a stained glass on a corridor window.

Wall Ceramic in the Meeting Room

In a rectangular planned meeting room, the wall in the short side is covered with dark brown wooden panels. In the middle of these panels, there is a wall ceramic from ground to ceiling (Figure 4). Unfortunately, there are not any accessible old photographs and writings related to this wall ceramic. The first furniture, which was designed with the building, and the wall colours might be changed in the period of time. Hence, it is hard to understand the relation of this wall ceramic with its original surroundings in the room. However, it is clear that this wall is an attractive background for the head of the meeting table and the wall ceramic is the focus of the room.

Figure 4. A wall ceramic on the background of a meeting room in the TMO General Directorate building;
a) general view of the whole wall,
b) closed view of the wall ceramic (Photographed by the author, 2008).

When the wall ceramic is examined in more detail, the circular form in the middle is the dominant figure. It is made up of concentric circles with radial lines. Although the general geometric shape can be clearly defined, all the lines have amorphous forms in detail like an ancient work of art. This type of art work reminds Atilla Galatalı's art works. In the Büyük Efes Hotel İzmir, Galatalı has two different art works using this type of ceramic in around 1964 (Figure 5). Moreover, he derived two art works with this circular ceramic and attended the 3th International Vallauris Biennale, which was directed by Picasso in France in 1972 (Galatalı, 1972) (Figure 6). In this biennale, one of his works won the international first prize and was taken to the permanent collection of the Ceramics Museum in Vallauris (Figure 6-a). Galatalı's these circular ceramics is said to be inspired by the sun and the Hittite art. By considering these similarities, it can be inferred that the wall ceramic in the TMO building might belong to either Galatalı or another artist who has an interaction with Galatalı. For the surrounding square elements of the wall ceramic, similar things can be inferred when comparing with the Galatalı's work in TPAO building in 1980 (Figure 7).

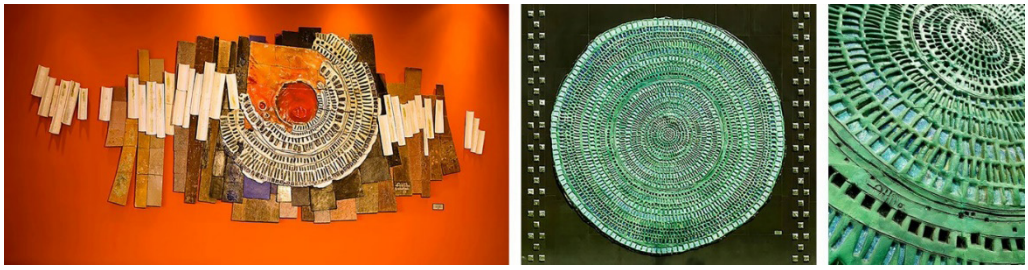

Figure 5. Atilla Galatalı's two ceramic works in Büyük Efes Hotel İzmir from 1964;
a) the building was completed in 1964 with its works of art, however some resources dated this art work to 1985,
b&c) 1964 (Büyük Efes Sanat, 2022).

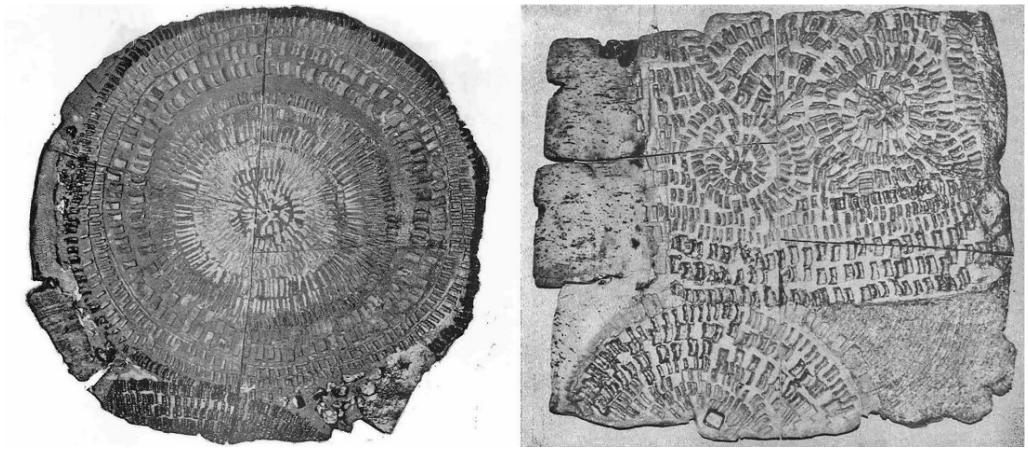

Figure 6. Atilla Galatalı's two ceramic works in the 3th International Vallauris Biennale in France in 1972;
a) Galatalı's work which won the international first prize and was taken to the permanent collection of the Ceramics Museum in Vallauris,
b) Galatalı's another work from the biennale (Galatalı, 1972).

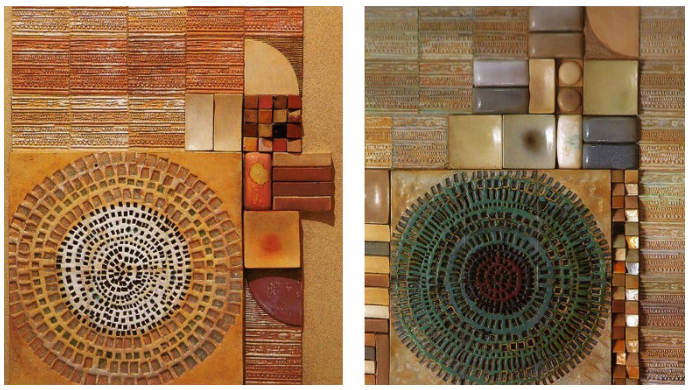

Figure 7. Two small parts of Atilla Galatalı's wall ceramic in TPAO head office in Ankara from 1980 (Bakla, E., 2022, Pinterest collection).

Wall Ceramic in the Old Cafeteria

The upper floors (8, 9 and 10) of the building were designed for special working functions, such as library and archive, in the preliminary project. However, in the application, these three floors were designed as cafeterias; tenth for a la carte service, ninth for tabldot (ordinary) service and the eight for official service. The kitchen was in the middle of these floors, in the ninth one. In the site analysis in 2008, a wall ceramic covering a partition wall was remarkable in one of these upper floors (Figure 8). Since the application plan of the related floor could not be reached, it is not clear whether this ceramic wall was first designed for a library or cafeteria. In 2008, it was seen that the cafeterias were moved to the appendix building in the west and these upper floors were used as offices as seen in Figure 8-b.

Figure 8. A wall ceramic on a partition wall in the TMO General Directorate building;
a) a black white photograph from early periods of the building around 1969 (SALT Research, 2019-a),
b) a colored photographed from 2008 (Photographed by the author, 2008).

The ceramic wall consists of brown lines parallel to the ground from edge to edge (Figure 8). The intervals of these lines are not equal. It is seen that they are thick in some rows and thinned in others. The background colour of each row changes between blue and white respectively. The rows with blue background are full of abstract figures as reliefs. Exceptionally, there is a figure in three of the white rows. Only three colours are used in the figures; black, white and orange. From these abstract figures, various plants, birds and horned animals, such as deer, are the ones which can be easily understood at first sight. These figures resemble the figures in Anatolian ancient arts. Moreover, they also resemble the motifs in rugs, calicos and other works in Anatolian culture.

Can (2018) mentioned this wall ceramic in her master thesis about "Ceramic Murals in Public Spaces in Ankara". A coloured old photograph of the ceramic wall was illustrated by referring the undergraduate thesis of Zeynep Yasa Yaman from 1978 (Figure 9). She cited that the photograph was from the TMO cafeteria in 1978. However, she also emphasized that the existing place and the situation of the ceramic were not known. In that photograph, some dining tables were partially seen near the both sides of the wall (Figure 9). She also stated that the

wall ceramic was Erdoğan Ersen's work of art. When one of Ersen's work from Büyük Efes Hotel İzmir in 1964 is analysed, similarities with the one in the TMO building can be identified (Figure 10). This similarity supports the statement of Can (2018).

Can (2018) defined the composition of the ceramic panel wall as clear, abstract and stylized quality. It was made by creating square-shaped tiles. The artist designed motifs by interpreting the archaeological and folkloric design elements. These motifs were placed as reliefs on horizontal stripes on the surface of the ceramic panel wall (Can, 2018).

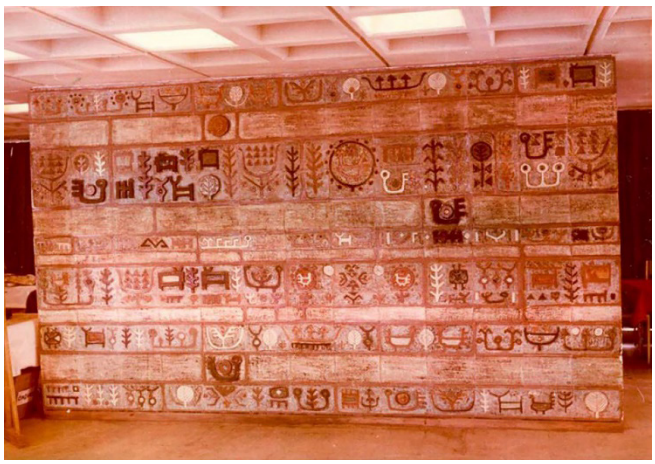

Figure 9. A photograph of the wall ceramic on a partition wall in the TMO General Directorate building from 1978 (Can, 2018).

Figure 10. Erdoğan Ersen's one of the wall ceramics in Büyük Efes Hotel İzmir around from 1964 (Büyük Efes Sanat, 2022).

Erbay Aslıtürk (2014) asked Ersen his materials, methods and colour preferences for his ceramic works. His answer was as follows: "I like colours a lot. But as Özdemir Asaf said white comes first. First of all, I would dream of making a white form. Colour comes in the secondary plan, even though I like colour". And he emphasized that he preferred technically high-quality cooked ceramics and loved terra rosa as earth (without being glazed) (Erbay Aslıtürk, 2014). These explanations also clarify the technique used in his art work in the TMO building (Figure 8).

Wall Mosaic with Stones in the Conference Hall Foyer

One of the qualified art work in the TMO building is the wall mosaic with stones in the second basement (Figure 11&12). This art work is covering the retaining wall of the conference hall foyer. Not only does it break the monotony of the blind wall, but it also creates a focus for those waiting the conference in the foyer.
With the natural colours of the stones used in the mosaic, the wall has colours ranging between beige, taupe and yellow. In its composition, a steppe landscape attracts attention. The first impression of the composition, reminds the landscape of the Middle Anatolia with its small hills. Same composition also resembles wheat fields with haystacks. However, a black tree branch is the clear and dominant figure of the composition due to its size and colour contrast. Why the branch has no leaf is in question. The artist might want an autumn

composition, the harvesting season, and emphasize it with a leaf-fallen tree. Another purpose might be to emphasize the aridity of this steppe land.

Figure 11. General view of the wall mosaic with stones in conference hall foyer, in the 2nd basement floor of the TMO General Directorate building. (Photographed by the author, 2008).

Figure 12. Detailed view of the wall mosaic with stones in conference hall foyer in the 2nd basement floor of the TMO General Directorate building. (Photographed by the author, 2008).

As in the case of other art works in TMO, there are not any accessible old photographs and writings related to this wall mosaic. In order to find an information, Cengiz Bektaş's achieve in SALT Research was searched in detail. In Denizli Halil Bektaş Primary School, one of his projects in 1968, a wall mosaic with marbles was remarkable (SALT Research, 2021) (Figure 13). Both the technique and the composition have some similarities with the one in the TMO building. In some of its photographs, following explanation was written: "marble mosaic work made by Tural Erol". Bektaş explained more information about this mosaic wall in one of his final interviews in his life (SALT, 2020). In around 1968, he said to his father (Halil Bektaş, the donor of the school); "If you allow me, I will ask my friend Turan Erol to make this wall a marble mosaic for 75 thousand liras". After his approval, he invited Tural Erol from Ankara. Moreover, Bedri Rahmi Eyüboğlu and Ahmet Berk also attended to the work. Bektaş stated that they made a mosaic by laying marble shards (SALT, 2020). The composition is composed of some group of trees and small one-floor houses which are also mostly used subjects in children's drawings. In general, the composition is an abstracted representation of a pastoral scene like a village. The perspective distortions resembles both the traditional miniature drawings and Picasso's modern cubist paintings. The construction dates of this wall mosaic were very close to the construction of the TMO Building (1964-1968) and it has some similarities with the wall mosaic in the TMO building. Hence, by considering the effects of the same architect, Bektaş, the participants and the technique of the wall mosaic might be similar in both buildings (Figure 11&13-b).

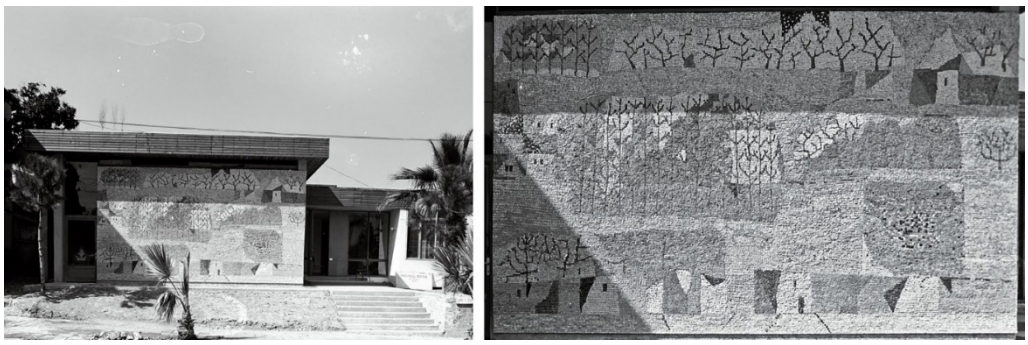

Figure 13. Denizli Hacı Bektaş Primary School, around 1968; a) front façade of the building with marble mosaic wall, b) closed view of the marble mosaic wall designed by Turan Erol (SALT Research, 2021).

Tural Erol mentioned about one of his art works in TMO in a newspaper interview in 2011 (Bildirici, 2011). He said that "We didn't always live on a salary. I also earned from murals. Efes Hotel in Izmir is one of the first things I did. For example, I have a 27 square meter stone mosaic panel composition in the in the foyer of the meeting hall of TMO". According to this description, the mentioned mosaic panel might be the one in Figure 11, which is around 3m x 9m. It is interesting that he mentioned this example after his first work on Büyük Efes Hotel İzmir. It might be one of his significant master pieces. It is also understood that the TMO, as an institution, valued the artists and was able to give the economic rewards of their works.

Erol's sayings about his paintings are also significant in order to understand the composition of the wall mosaic in the TMO building. He emphasized that he was not fond of accepted beauty in his pictures (Bildirici, 2011). He insisted that there was sadness in his paintings, and he added "If someone standing in front of my paintings feels calmness, silence, loneliness and sadness, I will have achieved my goal". He explained this as follows; "There is sadness in this land. My paintings are the reflection of this land. What does the artist do? His life reflects the world in which he lives. That's what I do." (Bildirici, 2011). This general description about his paintings also clarifies the yellowish and calm composition of the wall mosaic in the TMO.

Stained Glass over the Conference Hall Foyer

In the second basement of the TMO building, the wall mosaic is not the only art work but also the ceiling has an artistic reflection (Figure 14). Although the foyer is in the second basement, it has natural lighting from three skylights opening to the sunken courtyard of the first basement (Figure 15). Daylight coming from these skylights is filtered by stained glass (Figure 14). Moreover, the artificial lighting is also attached in these skylights and directed to the stained glass.

In the general design of the building, square forms are significant and the building is design with 12m x 12 m grids. In the preliminary project, it is seen that the sunken courtyard is also square shape in plan. There are three square planned skylights; however, their sizes and locations are designed free from each other (Figure 15). Their three-dimensional forms are truncated pyramids but symmetry was avoided in both plan and section planes. In the application project, these skylights were designed in the details of 1/20 and 1/1; however, stained glass was not drawn or mentioned in any of them (Figure 16). Hence, the stained glass might be designed after the building constructed in around 1968 or in late periods. There is not any other accessible written information about the stained glass in the TMO building.

Figure.14- Stained glass in the skylight of conference hall foyer, in the 2nd basement floor of the TMO General Directorate building. (Photographed by the author, 2008).

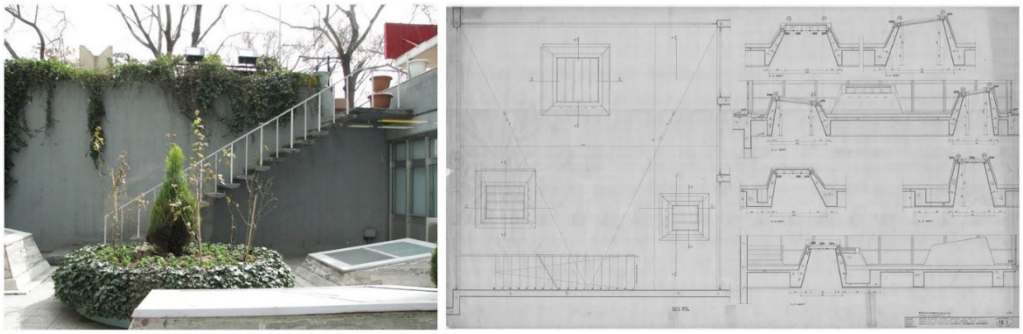

Figure 15. a) Courtyard and the skylight of conference hall foyer (Photographed by the author, 2008),
b) Plans and sections of courtyard and the conference hall foyer, in the 2nd basement floor of the TMO General Directorate building (TMO Technical Affairs Department project archive).

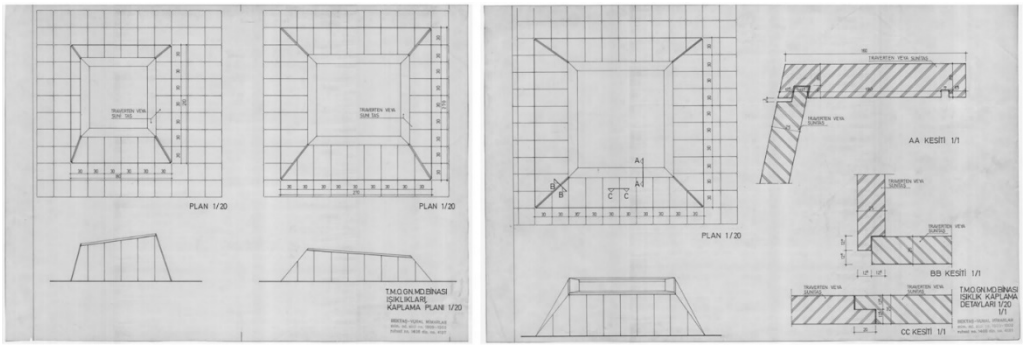

Figure 16. Application project details for the skylight of conference hall foyer, in the 2nd basement floor of the TMO General Directorate building (TMO Technical Affairs Department project archive).

Stained Glass on a Corridor Window and Other Art Works

In the site analysis in 2008, when the works of art in the building were asked to the TMO Technical Affairs Department project, the above mentioned four works were illustrated. However, while walking around the corridors, a stained-glass window was appeared by coincidence (Figure 17). Likewise, there might be other existing works of arts in the hidden details of the building. Moreover, although all of the first furniture of the building were designed with the building, it was hard to find the old ones in 2008. Similarly, some works of art might be moved to other buildings of TMO or lost in the renovations in the period of time.

A MONUMENTAL SCULPTURE FROM 1988: AN ARTISTIC ATTACHEMENT OF THE BUILDING

Ankara, as a capital city, is the place where all public institutions have their administrative buildings. In the garden of these buildings, monumental sculptures support their corporate identity and gain urban landmarks. In the 50th anniversary of TMO in 1988, a significant art event started for the TMO building. TMO organized a monumental sculpture competition in order to celebrate the 50th anniversary. Burhan Alkar was also one of the participants of the TMO competition. He was the artist of the monumental sculpture called "Tarımcı Atatürk (Agriculturist Atatürk)", which won the first prize in the competition of Atatürk Forest Farm (AOÇ) in 1981 (Figure 18). Hence, he experienced the subjects of agriculture in his previous works of art.

Figure 17. Stained glass window in the TMO General Directorate building. (Photographed by the author, 2008).

AOÇ monument is located in an open area that can be viewed from all sides. The sculpture is composed of five figures standing back-to-back. Özcan (2009) explained these figures as follows: The front side of the monument (welcoming the garden gate) symbolizes the agriculture of current time (Figure 18-a) and the back side symbolizes the agriculture of old times (Figure 18-b). In the front side, there is the figure of Atatürk in the front, a female figure (the symbol of abundance and fertility) on the right, an agricultural worker with a pickaxe in his hand on the left, and an agricultural technician (with a book in his hand) next to him. In the back side, there is a peasant, a shepherd and sheep. In this sculpture, Atatürk is depicted giving the title deed of the Forest Farm in his hand to the public. He is satisfied with the result, smiling and happy, and other figures also experience this happiness (Özcan, 2009). The monument is in a sloping land, and in both side of the sculpture, there are open stairs climbing from garden gate to a hill of the AOÇ. As a part this monument, Alkar also designed reliefs (about agriculture in Anatolia) in the corners of these stairs (Figure 18-c).

Figure 18. Burhan Alkar's "Tarımcı Atatürk" monumental sculpture in Atatürk Forest Farm AOÇ, 1981. (Burhan Alkar Atelier).

After a great experience in the monument of AOÇ in 1981, Alkar studied a similar subject eight years later. However, at that time, the context, the surrounding built environment were different and the subject was more specified in the mission of TMO. Taking these into account, Alkar, designed the monument called "Hasat Sonu (The End of The Harvest)" and won the first prize in the competition (Figure 19).

While the mission of the AOÇ is to create an exemplary farm in all areas of agriculture, the mission of TMO is summarized as "the friend of the farmer and the consumer even in the black days (hard times)". Hence, the composition of the monument should be changed accordingly. Moreover, the place of the monument is more limited area and has its own characteristics. It is in the corner of the garden, in which two streets from north and east are intersecting. Hence, the monument has two significant directions perpendicular to each other. Moreover, the corner of the garden is significant because it faces to the Güven Park connecting to the Kızılay Square which is the centre of the capital

Ankara. And the governmental buildings start from this corner to the south and west. Hence, the monument is not only a symbol of TMO but also a landmark of Ankara.

Figure 19. Burhan Alkar's TMO 50th anniversary monumental sculpture called "Hasat Sonu (The End of The Harvest)" in the garden of the TMO General Directorate building, 1989. (Photographed by the author, 2008).

Sönmez (2015) defined the TMO monument as it presented a scene from the life of farmers in accordance with its location. When the figures are examined in detail, it represents the moment just after the harvest. The man is holding a pitchfork and the woman is holding a baby. They are tired and sit on the rock and lean their backs against the wall, since they made a handwork. However, they are proud of producing, and they are happy and healthy because they can get paid for their labour. Similar composition can be seen in one of Alkar's small sculptures in Figure 20. It seems like the figures are sitting on a rock and leaning to a (unseen) tree. However, in the TMO monument, the farmer family is sitting on the abstract cylindrical forms (like the silos of TMO) and leaning to the letters of TMO (Figure 19). Therefore, the supportive mission of TMO after the farmers' harvest is represented.

Figure 20. a&b) Burhan Alkar's 40x44,25cm small sculpture which has similar figures with his TMO monumental sculpture (Sanat Mezat),
c) A wall of Burhan Alkar Aterlier and two hanging photographs of the TMO monumental sculpture (Burhan Alkar Aterlier, red marks were added by the author).

Rudolf Belling (the first foreign guest lecturer to train monumental sculpture in Turkey between the years of 1937 and 1966), emphasized the relations between "sculpture and architecture" and consider sculpture as "the synthesis of plastic and space" (Özyıldıran, 2021). In this point of view, the monumental sculpture of TMO has also significant aspects. The two main figures are facing towards the corner of the garden, which is directed to the Kızılay Square. Although their shoulders are touching each other, their sitting positions are perpendicular to

each other. While the man is sitting towards one street, the woman is sitting towards the other street. Hence, the monument is facing towards all the pedestrians coming from all directions. Similar angles are used for the TMO letters in the background. Letters are not in parallel lines, each of them turning to one of the two streets and he square, respectively. Although the figures of the man and woman (resting after hard work) are in static position, the position of the child adds dynamism to the composition. The child, sitting on mother's lap and looking at the different direction, is energic and curious to play games. In general, the monument is telling that the farmer family worked hard and gain with the support of TMO, and their future is hopeful. Moreover, with its synthesis of plastic and space, this monument is one of the significant landmarks of the city.

ART SUPPORTIVE MISSION OF TMO GENERAL DIRECTORATE: TMO DR. AHMET ÖZGÜNEŞ PLASTIC ARTS APPLICATION CENTER 1989-1994

Burhan Alkar's TMO monument was appreciated by the TMO. Hence, the sculpture competition in 1988, inspired TMO to establish a plastic arts application centre. The details of this centre were written in Özcan's (2015) interviews with Alkar. After the competition, the general directorate of TMO, Ahmet Özgüneş, requested Alkar to establish an art centre to teach art to TMO staff and other willing people over the age of 18 in Ankara. As an emeritus educator from Gazi Institute of Education, Alkar gladly accepted the request. The centre established in 1989 with the name of "TMO Dr. Ahmet Özgüneş Plastik Sanatlar Uygulama Merkezi" in one of the hangars in the Güvercinlik campus of TMO in Ankara. The aim was to introduce the problems and basic concepts of art to people who love art but have not found any chance to practice and work in this field, to develop their constructive and creative features, to train artist candidates and art lovers for society. Alkar defined this centre as follows: "This Art Centre is the place where my dreams, even the possibilities and beauties that I could not even dream of, come true." (Özcan, 2015).

The centre included many branches of art. Art experts from Gazi Institute of Education (such as Söbütay Özer, İhsan Çakıcı, Vedat Can, Zeki Şahin, Sabri Akça, Erol Batırberk, Hulusi Sezer and ceramics teachers Banu Serim, Seçil Külahçıoğlu and Ahmet Ünal) participated the centre as educators. Alkar said: "There were no obstacles for it to be an exemplary art centre. We acted accordingly." The workshops were open all days of the week between 09:00 in the morning and 22:00 in the evening, under the supervision of the gallery manager and the staff of the art centre. Classes were held at night, on Saturdays and Sundays. In the rest of the time, the trainees were able to do unlimited self-employment. Alkar emphasized that TMO gave all the required support for mandatory materials, technology or even technical personnel in workshops (Özcan, 2015).

Alkar stated that the garden of the art centre was equipped with mine, plastic, wood, cement, bronze and ceramic sculptures in a short period of four and a half years. They opened some exhibitions in and outside Ankara, and they aroused great interest in all branches; such as painting, graphics, stained glass, photography, ceramics and sculpture. In 1994, the art centre was closed due the changes in the circumstances in TMO. The art centre educated more than 200 students, and some of them (such as Erkan Ük, Güher Argın ve Adile Homan) continued their art works in a professional level (Özcan, 2015).

RESULTS AND DISCUSSION

In this study, existing examples of art works in TMO General Directorate building were tried to be found and analysed. In this context, two wall ceramics and a wall mosaic were found from 1960s. However, almost nothing was written about

them in the literature. The owners of the art works were tried to be detected by comparing similar examples from same periods and writings about the artists. According to this research, the wall ceramic in the meeting room belongs to Atilla Galatalı (or another artist who has an interaction with Galatalı), the wall ceramic in the old cafeteria belongs to Erdoğan Ersen, and the wall mosaic with stones in the conference hall foyer belongs to Turan Erol. However, Bektaş reported that Turan Erol did not work alone in the wall mosaic in Denizli Halil Bektaş Primary School, Bektaş, Bedri Rahmi Eyüboğlu and Ahmet Berk also helped for both the design and the construction of the work (SALT, 2020). In this regard, the art works in the TMO building might also be the products of collaborative works. According to published interviews, it is known that architect Cengiz Bektaş had a position that dominated all the details of the TMO building design and Bedri Rahmi Eyüboğlu inspired the overall interior design of the building as an artist. Moreover, Galatalı, Ersen and Erol were students of Bedri Rahmi Eyüboğlu from Academy. Hence, although mainly the names of the three artists were found for the three artworks, both Cengiz Bektaş and Bedri Rahmi Eyüboğlu might also have influence on these works. At least, they might determine what kind of art works was needed in which part of the building and who could design them.

When these three works are compared, an important common point draws attention. All of the art works have subjects related to Turkish Grain Board; sun, nature, agriculture and Anatolian culture. Since these are abstracted and interpreted representations, it is hard to understand the subject companion at first sight. However, the monumental sculpture produced in 1988, is clearly representing the mission of TMO with its figures of a farmer family. The comparison of Burhan Alkar's "Hasat Sonu (The End of The Harvest)" monument in TMO and "Tarımcı Atatürk (Agriculturist Atatürk)" monument in AOÇ is also significant. Although both of them represents the agriculture in Turkey, they differentiate in their focused subtopic. While the AOÇ monument addresses the agriculture in general (mostly by emphasizing the traditional old agriculture and the science-oriented new agriculture), the TMO monument focuses on the mission of TMO as the supporter of the farmers and the consumers. Moreover, both monuments were designed according to their place. This situation reflects the Rudolf Bellings' perspective of sculpture as "the synthesis of plastic and space" (Özyıldıran, 2021). Above all, the monument is not only a symbol of TMO but also a landmark of Kızılay in the centre of Ankara.

While searching about the monumental sculpture of TMO, the following story about the establishment of TMO Dr. Ahmet Özgüneş Plastic Arts Application Centre was also significant. This situation illustrated the general approach of TMO to the fine arts in the 1980s and 1990s. The institution was a pioneer in art education for both TMO employees and the people in Ankara. In this context, no written source could be found in the literature, except a written interview of Alkar (Özcan, 2009). However, this subject is so rich that might be a research subject in itself.

The limitations of this research were the detailed information about the stained-glass artworks and the missing artifacts, if any. Neither the dates nor the artists of the stained-glass artworks were able to be found in this research. At least, their places and forms are known. They are defined and illustrated for the future research. And existing wall mosaic and wall ceramics are documented as detailed as possible for the further research.
In conclusion, TMO General Directorate building is a significant example of art and architecture synthesis from 1960s. Similar to the Yavuz's (2008) definition about this type of synthesis, the TMO building is an integration of a universalized modernist architecture with works of art, that contain folkloric elements and have traces from the local. With this type of approach, Bozdağan's (2008) concept

called "nationalization of the modern", can be seen in the TMO building. This design and construction of the TMO building was the result of the collaboration of a large number of architects, engineers and artists who are experts in their fields. At this point, the approach of TMO, the employer institution, was also significant during the design and construction phases of the TMO building. Moreover, the institution's relationship with art did not remain in the 1960s, but it was also continued with the monument sculpture competition opened in 1988 in its 50th year. Furthermore, the establishment of TMO Dr. Ahmet Özgüneş Plastic Arts Application Centre seems a significant mission for art education in Ankara between 1989 and 1994. It is hoped that the TMO General Directorate building and its works of art become known in the literature in order to conserve the cultural heritage and shed light to the further research.

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Ethics Committee Approval
Ethics committee approval was not required for this article.

Legal Public/Private Permissions
In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions, and organizations) during the survey and in-depth interviews.

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Formaldehyde Emission in Different Positions of Wood-Based Boards Used in Interior Architecture

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Abstract

This research focuses on determining the effects on the formaldehyde emission (FE) of the middle and edge parts of two different wood-based boards (WBBs) consisting of medium density fiberboard (MDF) and particleboard (PB), which are widely used in interior architecture. Samples with the thicknesses of 18 mm were analyzed for FE at a temperature of 20 °C and 65% relative moisture content for 1, 2 and 3 hours after manufacture. In the PB samples, the highest value of FE (0.4119 ppm) was determined in the samples obtained from the center while the lowest emission value (0.0875) was observed in the samples obtained from the edge. In the MDF samples, the highest value of FE (0.3012 ppm) was determined in the samples from the center while the lowest emission value (0.1807 ppm) was observed in the samples from the edge. The PBs have a higher environmental impact (0.2497 ppm) than the MDFs (0.2454 ppm). For distances to minimum values (0.10 ppm), while the furthest value for the central samples of PB was 311%, the closest value for the edge samples of PB was -12.5%.

Keywords: Formaldehyde Emission, Furniture, Interior Architecture, VOC, Wood-Based Boards.

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INTRODUCTION

Interiors play a significant role in people's lives (Klepeis et al., 2000). For this reason, interior air quality is very important for people's right to live a healthy life. The World Health Organization (WHO, 2014) reports that every year, approximately 4.3 million people die as a result of internal pollutants. As argued by Zhuge et al. (2018) and Landrigan et al. (2018). The global burden of illness is significantly increased recently, Bad interior air quality can be partly attributed to organic chemicals from wood-based boards (WBBs) (Zhangcan et al., 2019). In recent years, as Çınar (2018) states, the intense demand from the construction and furniture industries has seriously affected the consumption of wood materials in the manufacture of WBBs, which are widely used in the furniture industries. The reduction of many natural resources due to global industrialization has become the driving force for product differentiation in the wood industry. Therefore, wood-based materials are widely used and preferred in the production of fixed or movable interior equipment, in the construction industry, and in repair and restoration work. In addition, increasing environmental concerns in recent years, such as public intense, pressure and tougher regulations have altered the way business is conducted. The resulting environmental pressures have a direct impact on the preferences of consumers who are aware of the growing need for sustainable furniture. Wood products industry has begun to improve the properties of products in terms of environmental processes in order to reduce negative public awareness about timber production and management. Moreover, wood-based boards (WBBs) are highly preferred in furniture production and various interior design projects due to their easy processing and dimensional stabilization properties (Zhang et al., 2018).

The rising awareness has led consumers, entrepreneurs and decision-makers to improve their sustainable environmental requirements. This situation impresses the forest products and furniture industries, including the manufacturing and environmental aspects of WBBs (Çınar et al., 2018). WBBs such as medium density fiberboard (MDF), plywood (HWPW) and particleboard (PB) are widely used in interior reinforcement elements and thin construction elements. Their usage time is also quite long (Shalbafan et al., 2016; Trianoski et al., 2017; Latorraca et al., 2009; Salthammer et al., 2010 and Tang et al., 2009). As a result, the manufacture method and stages of WBBs have become a very important issue in terms of being compatible with the environment wood based materials and products. In some studies, it is stated that organic chemicals such as phenolic compounds, organochlorins and formaldehyde (F) emitted from these products cause serious health problems on employees/users (Pearson, 1994; Yıldırım 2013; Cinar and Erdoğdu, 2018). In recent years, many scientific studies have been carried out on formaldehyde emission (FE) and gases emitted from wood-based panels. Free Formaldehydes (Fs) remaining in WBBs are the main source of interior pollution (Zhang et al., 2018). In particular, significant quantities of synthetic adhesives such as phenol (P) or urea formaldehyde (UF) are required for the production of boards. Synthetic adhesives are predominately used in the production of WBBs such as MDF, PB, plywood, and wet-process MDF. UF resin is one of the most preferred synthetic adhesives due to its high performance and low cost, which is widely used in the production of WBBs (Tang et al., 2009; Park and Kim, 2008). The biggest disadvantage of the most popular and widely used UF resin is that it contains FE.

F is defined as a distinctive, colourless, gaseous and flammable substance that exists in various forms at room temperature (Pearson, 1994). The accumulated effect of the concentration of F emitted from the interior equipment and various products can pose a serious danger to the health of people in a closed space. F

concentrations among 0.1 ppm and 0.5 ppm can cause redness and burning in the nose, eyes and throat, and some sensitive people can detect this irritation by smell (Salem and Böhm, 2013). Pearson (1994) states that FE produces irritation to the nose, eyes, skin and throat. Given the problems encountered, it often appears to be related to nosebleeds and breathing difficulties and is suspected to be carcinogenic at levels of 0.5 to 1.0 ppm. It can also cause dermatitis as a result of an allergic reaction to organic chemicals on contact (Isaksson et al., 1999). According to Schafer and Roffael (2000), F in wood varies depending on the quality of the wood and the inner layers of the pre-processing. In fact, F concentration is usually very low. Still, the actual release of F comes from the wood adhesives used during and after the production of WBBs. Several case studies on the production, environmental properties and applications of finishes of WBBs have been conducted (Rivela et al., 2006, 2007; Raffael, 2006; Wilson, 2010; González-García et al., 2009; Benotto et al., 2009; Antov et al., 2021; Silva et al., 2013, 2014; Kouchaki-Penchah et al., 2016; Saravia-Cortez et al., 2013; Nakano et al., 2018). Also, some studies focused on the environmental properties of WBBs and the investigation of various varnishes used (USEPA 1998, 2001; Brockmann et al., 1998; Kim and Kim, 2005; Cinar, 2005; Gonzalez et al., 2011; Zhongkai et al., 2012; Chuck and Jeong, 2012; Khanjanzadeh et al., 2014; Aghakhani et al., 2013). Some other studies focused on the effects of the temperature and humidity on FE (H'ng et al., 2012; Luo et al., 2005; Oliveira et al., 2017; Funk et al., 2017, Akkuş et al., 2021). The study of Cinar et al. (2018) shows that there is a strong relationship between increasing FE and increasing thickness and temperature. Furthermore, panel-processing (edge banding, covering panel surfaces, and drilling holes for hinges or handles) has a significant impact on FE (Cinar et al., 2018).

When evaluating WBBs, the literature discussed above provides a useful background on the importance of considering board manufacture, material selection, and regional characteristics. The revelation of the environmental effects of WBBs through scientific studies will be an important factor for manufacturers in developing new products from an environmentally friendly standpoint, thereby accelerating their entry into the growing green products market. Considering environmental factors at the preliminary decision stage before beginning product development and design will eliminate significant health problems that may arise later. (Cinar, 2005). In the market, WBBs are usually sold with dimensions of 210cm x 280cm or 183cm x 366cm with different thicknesses. Furniture is made with the largest dimension ranging from 60cm to 80cm in the furniture industry. The question here is to investigate the FE of WBBs after being processed in the fabrication of furniture using common dimensions. This research aims to analyse the effects of WBB types on FEs for the MDFs and PBs, which are generally used in the solid and composite wood furniture production sector in Türkiye. According to the literature discussed above, the research hypotheses developed as required by the research content are listed below.

H1: There are significant differences between formaldehyde emission measurement values between medium density fibreboard and particleboard wood-based boards.

H2: There are notable differences between formaldehyde emission measurement values for different positions of wood-based boards.

H3: Formaldehyde emission measurement values of medium density fibreboard and particleboard will vary according to the measurement time after preparation of the samples in the laboratory.

MATERIAL AND METHOD

This research determined impacts of board type, temperature and thickness on FE emission from the wood-based samples, which were prepared from different positions of MDF and PB. The obtained emissions were analysed and compared with the limited values of eco indicator as parts per million (ppm). Eco-Indicator 99 (Goedkoop and Spriensma, 2000) was used to check the quantitative data representing FE, which was measured in accordance with TS EN 717-1 (2006) by a MultiRAE multiple gas analyser.

Boards and Adhesive

Two different types of WBBs with 18 mm thickness were tested: 1) MDF, manufactured according to TS EN 622-5 (2008) and 2) PB, manufactured according to TS EN 312 (2005). UF adhesive, code 230026592, W-Leim Plus 3000, Lillestrom, Norway was used for the board production processes. These are the standard materials used in the Türkiye furniture industries. The MDFs and PBs were supplied from Türkiye's main WBB producing factories. Test samples were acquired from the boards of 210cm x 280cm x 0.18cm with respect to TS EN 326-1 (1999). The features of boards and adhesive are given in Table 1 and Table 2.

Table 1. Main features of the boards

Boards	Dimension mm			Weight gr	Density gr/cm³
	Thickness	Width	Depth		
MDF	18	500	500	3620.58	0.7433
PB	18	500	500	2867.15	0.6433

Table 2. Features of the adhesive (UF)

Adhesives	Density (20 ◦C) (g/cm³)	Viscosity (20 ◦C mPas)	pH 20 ◦C	Amount of adhesive application (g.m³)	Amount of solid material %
Ure-Formaldehyde	1.220	16.000 ± 3.000	8.0	180- 200	55±1

Sample Preparation

Twenty samples were prepared from 18 mm thick MDF and PB pieces used in the experiments. Board samples were cut to 500 mm by 500 mm, weighed with a sensible scale, Precia Gravimetrics 312-6200C, in compliance with TS EN 326-1 (1999), and each sample was numbered from 1 to 20, packed with transparent nylon to prevent FE (Figure 1), and stored at the room temperature of 20°C and 65% humidity to achieve a moisture value equal to indoor physical environment conditions with respect to TS EN 2471 (2005).

Figure 1. Number of samples at positions and keeping samples for experiment

Application of Experiment

FE measurements were taken from the newly produced MDF and PB, which were stored less than 3 days in a large-scale board manufacturing factory. These experiment samples were put into the Climatic Test Cabinet TK600NUVE (2012) at 20°C and 65% humidity and their corresponding FE values were calculated by a gas analyser at 1, 2, and 3 hour intervals. The experiment samples were

prepared from the boards supplied directly from the factory in accordance with EN 13986 (ECS, 2015) and test method TS EN 717-1 (2006). The climatic test cabinet and the multi-RAE multi-gas analyser are given in Figures 2ab.

a. Climatic Test Cabinet b. Multi-RAE Multiple Gas Analyzer

Figure 2.a/b Climatic test cabinet and Multi-RAE Multiple gas analyzer

Statistical Analysis

The data obtained from the F measurements are presented in summary to determine the effects of FE on unprocessed and processed wood-based boards, as well as to compare the findings scientifically and make them more understandable. The measurements of the FE in different positions of the WBBs (MDF and PB) were identified as dependent variables (Table 4), whereas, the exposure time of the WBB within the test cabinet and the selected board position were defined as independent variables. Subsequently, single variance analysis (ANOVA) was used in order to examine the impacts of board positions (Figure 4) and time (1st, 2nd and 3rd hours) on the release of the FE in the WBBs. The mean values were determined to be important in the variance analysis and the results were presented in a graph.

RESULTS

The reliability of the "dependent variables" covering FE values at different positions of WBBs was analysed using Cronbach's Alpha reliability test. Cronbach's Alpha estimates of inner consistency for the two scales, as well as the FE values in Table 4, were as follows: MDF: 0.989 and PB: 0.993 (Table 3). In previous articles by Cronbach (1951) and Panayides (2013), it was clearly expressed that alpha reliability coefficients for all items (1st, 2nd and 3rd hour interval measurements) could be accepted as 'reliable' if they were above 0.70. Thus, this scale may be considered to be good reliable. Reliability analysis results of the variables for FE on WBBs are given in Table 3.

Table 3. Results of the variables' reliability analysis

Boards	Scale Items	Item Reliability	Scale Reliability
MDF	1st hour	0.984	0.989
	2nd hour	0.980	
	3rd hour	0.988	
PB	1st hour	0.992	0.993
	2nd hour	0.986	
	3rd hour	0.992	

Notes: MDF: Medium Density Fibreboard and PB: Particleboard.

The FE measurements in the different positions of the WBBs over a 3 hour period including the distance of mean to limit value (0,10 ppm) are demonstrated in Table 4.

Table 4. FE for different board positions and distance to limit ≤ 0.1 ppm

Boards	Hours ppm				Distance to limit ≤ 0.1 ppm	
	1	2	3	Mean	ppm	%
MDF whole	0.2217	0.2483	0.2663	0.2454	0.1454	145.4
MDF edge	0.1567	0.1833	0.2021	0.1807	0.0807	80.7
MDF centre	0.2867	0.3133	0.3306	0.3102	0.2102	210.2
PB whole	0.2218	0.2540	0.2732	0.2497	0.1497	149.7
PB edge	0.0576	0.0947	0.1103	0.0875	-0.0125	-12.5
PB centre	0.3861	0.4133	0.4361	0.4119	0.3119	311.9

Notes: MDF: Medium Density Fibreboard, PB: Particleboard, Edge: Measurement of the samples on the edge of the PB/MDF, Centre: Measurement of the samples on the middle of the PB/MDF.

According to the results given in Table 4, the release of FE from the edges of the boards is less than the release from the middle parts in both MDF and PB. The differences for the FE in the different positions of the boards were tested with ANOVA. In the analysis results in Table 5, prominent differences between the variables including the measurement results of the FE at different positions of the boards were determined to be statistically important at the p<0.001 level for all items related to the research scale.

Table 5. Analysis results of the variables regarding FE in the different positions of the boards (MDF and PB)

FE in Different Positions of Boards		Sum of Squares	df	Mean Squares	F	Sig.	Results
1st hour	Between groups	0.105	1	0.105	14.591	0.000*	*P* < 0.001
	Within groups	0.849	118	0.007			
	Total	0.954	119				
2nd hour	Between groups	0.103	1	0.103	15.005	0.000*	*P* < 0.001
	Within groups	0.812	118	0.007			
	Total	0.915	119				
3rd hour	Between groups	0.116	1	0.116	16.230	0.000*	*P* < 0.001
	Within groups	0.843	118	0.007			
	Total	0.958	119				

*Note: * a: 0.001 is the level of significance.*

The differences between the values of FE depending on the different positions of the boards are illustrated in Figure 3. It can be observed that the PB releases more FE than the MDF with the passing of time for each variable. According to this result, the hypothesis put forward in H1 is supported. This finding indicates that the cellular structure of the fibres used in MDF may be due to the more deformation of the cellular structure of the fibres used in PB. On the other hand, the higher FE content of PB may be related to panel density when compared to MDF. This result may be related to the higher FE content panel density of PB in comparison to MDF. The most significant result is that the samples of P7, 8 and 9 and P12, 13 and 14 in the board's centre, released more FE than P1-6, P10-11 and P15-20, which are placed at board's edge.

According to the results, it is possible to say that less FE is released from the experimental samples cut from the edge parts of both boards than the middle part. At the end, the differences between the different positions on the boards have a critical impact on the values of the FE. This shows that less FE is released from the edges of the untreated (uncut) board compared to the middle portions. These results indicate that the hypothesis advanced in H2 is supported.

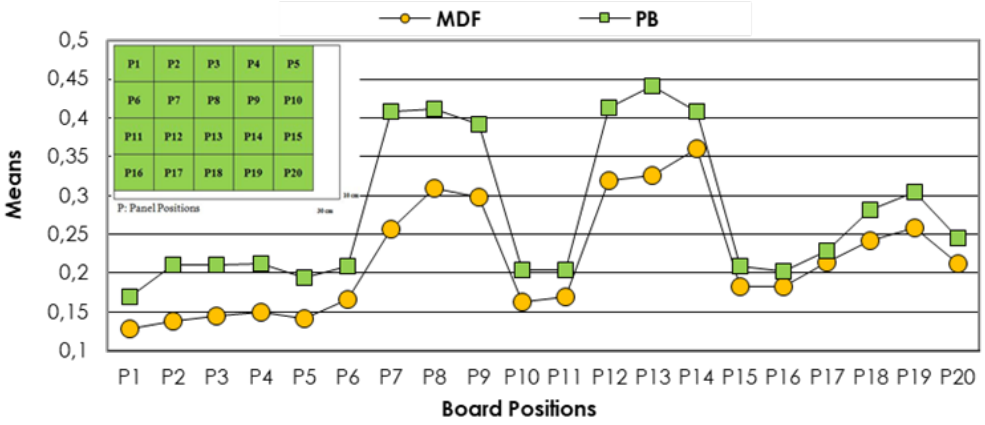

Figure 3. Impact of the different board positions on measurements (MDF and PB)

The differences between the FE values according to the different positions of the MDFs were tested with ANOVA. In the analysis results in Table 6, prominent differences between the variables including the measurement results of the FE in the different board positions were determined to be statistically important at a level of $p < 0.001$ level for all the items (1st, 2nd and 3rd hours) related to the scale.

Table 6. Analysis results of the variables regarding formaldehyde emission in the different positions of the MDF

	MDF Board	Sum of Squares	df	Mean Squares	F	Sig.	Results
1st hour	Between groups	0.316	19	0.017	195.677	0.000*	$P < 0.001$
	Within groups	0.003	40	0.000			
	Total	0.319	59				
2nd hour	Between groups	0.285	19	0.015	143.007	0.000*	$P < 0.001$
	Within groups	0.004	40	0.000			
	Total	0.289	59				
3rd hour	Between groups	0.311	19	0.016	77.098	0.000*	$P < 0.001$
	Within groups	0.008	40	0.000			
	Total	0.319	59				

*Note: * a: 0.001 is the level of significance.*

The differences between the FE values depending on the different positions of the MDF are illustrated in Figure 4. As seen, the experimental samples cut from the edge parts of the MDF releases more FE than the experimental samples from the middle part in time. Consequently, the changes between the different positions have an important effect on the FE values. Figure 4 clearly indicate the differences between the release of FE from edge and middle parts of MDF.

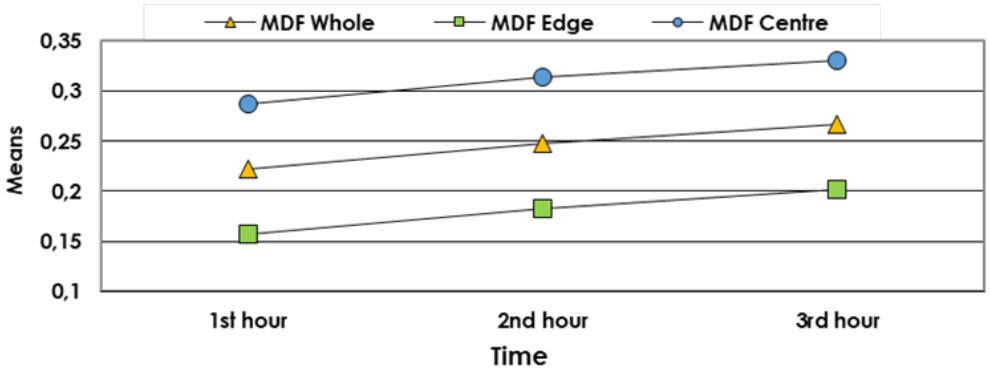

Figure 4. Impact of the different board positions on measurements (MDF)

The differences between the values of FE according to the different positions of the PB were tested with ANOVA. In the analysis results in Table 7, prominent differences between the variables including the measurement results of the FE in the different board positions were determined to be statistically important at a level of $p < 0.001$ level for all the items (1st, 2nd and 3rd hours) related to the scale.

Table 7. Analysis results of the variables regarding formaldehyde emission in the different positions of the PB

	PB Board	Sum of Squares	df	Mean Squares	F	Sig.	Results
1st hour	Between groups	0.528	19	0.028	475.994	0.000*	$P < 0.001$
	Within groups	0.002	40	0.000			
	Total	0.530	59				
2nd hour	Between groups	0.520	19	0.027	432.093	0.000*	$P < 0.001$
	Within groups	0.003	40	0.000			
	Total	0.522	59				
3rd hour	Between groups	0.520	19	0.027	304.011	0.000*	$P < 0.001$
	Within groups	0.004	40	0.000			
	Total	0.523	59				

*Note: * a: 0.001 is the level of significance.*

The differences between the FE values depending on the different positions of the PB are illustrated in Figure 5. As shown, for each variable according to the time, the experimental samples cut from the edge parts of the PB releases more FE than the experimental samples from the middle part. As a result, the differences between the positions have an important effect on the FE values. Figure 5 clearly indicates the differences between the release of FE from edge and middle parts of PB.

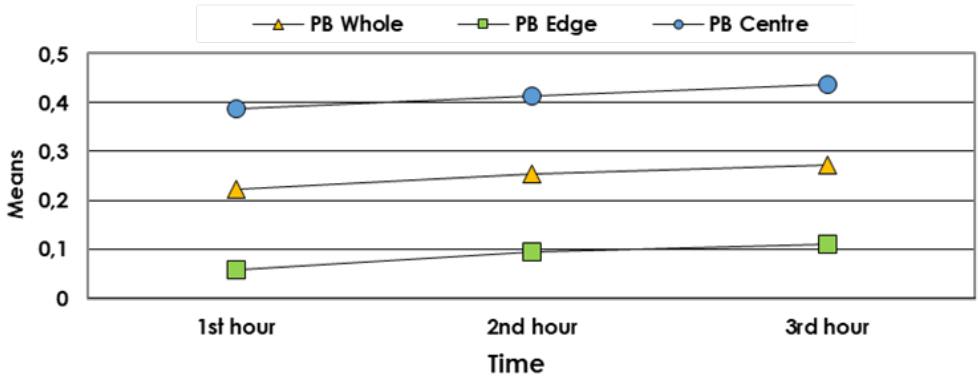

Figure 5. Impact of the different board positions on measurements (PB)

The results provided in Table 6 and 7 show that the hypothesis put forward in H3 is supported.

CONCLUSIONS AND SUGGESTIONS

The results of this research yields that the cut parts from the wood-based boards (WBBs) is significant in terms of the formaldehyde emission (FE) because of the place overall position of the boards. Following are some possible conclusions:

- The highest FE value (0.4119 ppm) was determined in the samples taken from the centre, while the lowest FE value (0.0875) was obtained from the samples taken from the particleboard (PB) edges.
- The highest FE value (0.3012 ppm) was obtained from the samples taken from the centre, the lowest FE value (0.1807 ppm) was obtained from the samples

taken from the edges of medium density fibreboard (MDF).

- The PBs have a higher environmental effect (0.2497 ppm) than the MDFs (0.2454 ppm).
- While the farthest value to the limit values (0.10 ppm) was 311% for the central samples of PB, the closest value was determined as -12.5% for the edge samples of PB.
- Based on these results;
- By keeping the parts to be cut from the edges of the boards waiting for less time, they can be assembled more quickly.
- The parts to be cut from the inner parts of the boards can be waited for a while until the formaldehyde emission reaches the limit values before production and assembly, and then processing can be started.

In the selection of WBBs and complementary elements, which are widely used in various design projects in the building and furniture industry, their possible negative effects on humans and the environment must be considered. It should be noted that the ratio of organic chemicals in these panels should not exceed the limit values published by the World Health Organization. To reduce the gas emission in indoor environments, it is strongly recommended to wait for a certain period of time after the panels are cut in the manufacture of panel furniture, and then it is recommended to start the processes such as veneer covering coating and edge banding etc. (Cinar et al., 2018). In the short term, it can be expected that the concept of green design will be more prominent in project solutions, as it is now with universal design. Consequently, more research on the impact of some design decisions regarding product and environmental quality should be conducted, and future work in this area should be encouraged.

Conflict of Interest
No conflict of interest was declared by the authors.

Authors' Contributions
The authors contributed equally to the study.

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Ethics Committee Approval
Ethics committee approval was not required for this article.

Legal Public/Private Permissions
In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions, and organizations) during the survey and in-depth interviews.

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