

**DAYLIGHT IN ARCHITECTURE:
A STUDY OF THE CORRELATION BETWEEN SPATIAL
QUALITY AND HUMAN EMOTIONS**

The dissertation presented to the faculty of architecture
of the University of Moratuwa, Sri Lanka, for the
final examination in M. Sc. (Architecture)

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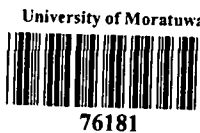
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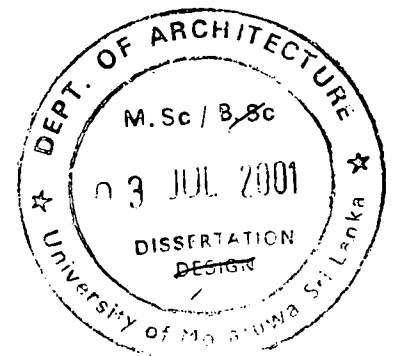
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ABSTRACT

A work of art is often a spontaneous expression of feelings. Architecture is another form of art, which is a creation of forms and spaces symbolic of human feeling. A work of architecture on the other hand is more than an "arrangement" of given things- even qualitative things.

Qualities enter directly in to the space itself not as its content but as constitutive element in it. Feeling 'expressed ' in architecture is '**feeling or emotions presented as the qualitative character of imaginable content'**.

Architecture is so generally regarded as an art of space, meaning actual, practical, space and building is so certainly the making of something that defines an arranges spatial units, that every body talks about architecture as a "spatial creation". This basic vocabulary is capable of being enriched and made still more expressive by the emotive associations of light. One of notions which evokes a strong 'emotional' impact or elevates a space to a realm of emotive responsiveness is light.

Space is in the practical world has no shape. There are spatial relations, but there is no concrete totality of space. It is a substrate of all experiences gradually discovered by the collaboration of man's several senses. It is a collective image in human psyche.

But crucial thing is modern architecture fully ignored this essential quality and buildings are becoming technical and meaningless. Principle objective of this study is therefore to explore that how architect could contribute to elevate this necessary sense by emotive use of daylight.

It is quite evident that light creates qualities, which are abstract in mind, when it strikes on a surface or passes through a space. This is the essence in spatial quality. According to this study has opened new vistas in to realm of emotive architecture, which can be elevated by element of light.

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LIST OF CONTENTS

| | |
|---|------|
| ABSTRACT | ii |
| ACKNOWLEDGMENT | iii |
| LIST OF CONTENTS | iv |
| LIST OF ILLUSTRATIONS | viii |
| INTRODUCTION | 1 |
| 0.1 Topic explanation | 1 |
| 0.2 Importance of the study | 2 |
| 0.3 Need of the study | 4 |
| 0.4 Intention of the study | 6 |
| 0.5 Scope and limitation | 7 |
| 0.6 Methodology | 8 |
|  University of Moratuwa, Sri Lanka Electronic Theses & Dissertations www.lib.mrt.ac.lk | |
| CHAPTER ONE | 10 |
| 1.0 DOMAIN OF ART IN ARCHITECTURE IN RELATION TO ELEMENT OF LIGHT | 10 |
| 1.1 Nature of daylight | 10 |
| 1.1.1 Light on nature | 11 |
| 1.1.2 Light and human emotions | 12 |
| 1.2 Spatial conception in art | 14 |
| 1.3 Architecture As an art of defining space through the mediation of daylight. | 16 |
| 1.3.1 Architecture as an art | 16 |
| 1.3.2 Notion of light in art | 18 |
| 1.3.3 Light in architecture | 20 |
| 1.4 Concluding remarks | 23 |



| | |
|---|-----------|
| CHAPTER TWO | 24 |
| 2.0 CONTRIBUTION OF LIGHT IN THE DEFINITION OF SPACE IN ARCHITECTURE. | 24 |
| 2.1 Nature of space | 24 |
| 2.1.1 Intangibility of space | 24 |
| 2.1.2 Perception of space in architecture | 26 |
| 2.1.3 Human behavioral pattern in space | 27 |
| 2.2 Establishment of spatial conception | 29 |
| 2.2.1 Expression of space in terms of context | 29 |
| 2.2.2 Light, shadow and form | 31 |
| 2.2.3 Fusion of space and mass | 33 |
| 2.2.4 Manifestation of elements on the boundary/ barrier | 35 |
| 2.3 Spatial conception as an inside out side relationship | 37 |
| 2.3.1 CONCEPTION ONE: Volumes which does not consist an interior(Elements in space) | 38 |
| 2.3.2 CONCEPTION TWO: Exterior and interior are two unrelated consequent events. | 39 |
| 2.3.3 CONCEPTION THREE: Exterior and interior as related interdependent events. | 41 |
| 2.4 Concluding remarks. | 42 |

| | |
|---|-----------|
| CHAPTER THREE | 43 |
| 3.0 DAYLIGHT ON BUILT SPACE: MANIPULATION OF BARRIER | 43 |
| 3.1 Qualitative attributes of light | 43 |
| 3.1.1 Shadow | 43 |
| 3.1.2 Light and Dark | 45 |
| 3.2 Direct way of manipulation | 47 |
| 3.2.1 Light space | 47 |
| 3.2.2 Light as an object | 48 |
| 3.2.3 Light as series of objects | 49 |
| 3.2.4 Light from surface | 50 |
| 3.3 Reflected light | 51 |
| 3.4 Filtered light | 53 |
| 3.5 Concluding remarks | 54 |
| CHAPTER FOUR | 55 |
| 4.0 THE CORRELATION: SPATIAL QUALITY AND HUMAN EMOTIONS THROUGH MANIPULATION OF DAYLIGHT | 55 |
| 4.1 Conception one: Elements in space | 55 |
| 4.1.1 Reflected light: Enhancing mass in space (Contextual relation) | 55 |
| 4.1.2 Contribution of shadow for division of space and mass | 57 |
| 4.2 Conception two: Exterior and Interior are two unrelated consequent events | 59 |
| 4.2.1 Light space: Space within space | 60 |
| 4.2.2 Light as an object: Element of attraction | 63 |
| 4.2.3 Light as series of objects: Series of punctures | 65 |



| | |
|---|------------|
| 4.3 Conception Three: Exterior and Interior as related interdependent events. | 69 |
| 4.3.1 Light space: continuity with outside | 69 |
| 4.3.2 Light from surface: Transparency in barrier | 71 |
| 4.3.3 Reflected light | 75 |
| 4.3.4 Filtered light | 78 |
| 4.4 Concluding remarks | 84 |
| | |
| CHAPTER FIVE | 85 |
| 5.0 IMPLICATIONS OF SPATIAL QUALITY ON THE HUMAN PSYCHE. | 85 |
| 5.1 Conception One: Elements in space | 85 |
| 5.2 Conception Two: Exterior and interior are two unrelated consequent events | 86 |
| 5.3 Conception Three: Exterior and Interior as related interdependent events. | 88 |
| | |
| SUMMERY | 91 |
| CONCLUSION | 95 |
| LIST OF REFERENCES | 99 |
| BIBLIOGRAPHY | 101 |

LIST OF ILLUSTRATIONS

| Figure No. | Description | Pg. No |
|------------|---|--------|
| 01 | Light : quantity to quality | 10 |
| 02 | Silhouetted quality of women – light on nature. | 11 |
| 03 | Light and Mood | 12 |
| 04 | Evening light ; Essence in mood making. | 13 |
| 05 | Art : two Dimensionality | 14 |
| 06 | Sculpture : Dominates the surrounding space. | 14 |
| 07 | Architecture : Three dimensionality | 15 |
| 08 | Penetration in architecture. | 17 |
| 09 | Space in a Jungle by Lucky Senanayake | 18 |
| 10. | Vermeer's painting with light. | 19 |
| 11. | Light in western architecture. | 21 |
| 12. | Light in Japanese architecture. | 22 |
| 13. | Intangibility in architectural space. | 25 |
| 14. | Man and his behavior on space. | 28 |
| 15. | Interpretation of nature in architecture. | 30 |
| 16. | Space in a context | 30 |
| 17. | Overlapping shadow on masonry form. | 32 |
| 18. | Light and shadow – form making in architecture. | 32 |
| 19. | Fusion of mass with element of light | 33 |
| 20. | Mass and its relation to space. | 34 |
| 21. | Barrier : façade of inside – outside | 35 |
| 22. | Barrier with holes. | 36 |
| 23. | Barrier dematerialization. | 36 |
| 24. | Element of space. | 39 |
| 25. | Inside – outside as two different events. | 40 |
| 26. | Light as an element. | 40 |



| | | |
|-----|---|-----|
| 27. | Barrier as a frame work. | 41 |
| 28. | More penetration: In out relation. | 41 |
| 29. | Shadow enhanced the three dimensionality | 43 |
| 30. | Shadow in an arcade. | 44 |
| 31. | Light and dark quality in a passage. | 45 |
| 32. | Darkness to light – resting soul. | 46 |
| 33. | Sketch – light space. | 47 |
| 34. | Light space : transparent box. | 48 |
| 35. | Sketch – light as an object | 48 |
| 36. | Light as an object. | 49 |
| 37. | Sketch – light from series of objects. | 50 |
| 38. | Light from series of objects. | 50 |
| 39. | Sketch : Light from surface. | 51 |
| 40. | Light from surface. | 51 |
| 41. | Sketch – light reflects in different ways. | 52 |
| 42. | Reflections in water. | 53 |
| 43. | Sketch – filtering of light through netly structures. | 53 |
| 44. | Filtered light. | 54 |
| 45. | Light enhances monumentality of sculptural forms. | 56 |
| 46. | Light reflects from mass. | 56 |
| 47. | Reflected light and solid mass enhancing the quality of fertile valley. | 57 |
| 48. | Shadow on pyramid – enhancing three dimensionality. | 58 |
| 49. | Stupa – Different massing principle with light. | 59 |
| 50. | Light space as main attraction | 60 |
| 51. | Light space in darker tunnel at Ronchamp chapel and in a Buddhist temple. | 61 |
| 52. | Light from up – Interpretation of heaven. | 61 |
| 53. | Light space for spatial progression. | |
| 54. | Light space making intimacy. | 62 |
| 55. | Object on barrier. | 63. |



| | | |
|-----|---|----|
| 56. | Church in light – light objects to concentration of mind. | 64 |
| 57. | Pantheon Rome – light from heaven. | 65 |
| 58. | Light from series of objects. | 66 |
| 59. | Overlapping light from objects. | 66 |
| 60. | Variety of objects to variety of spaces. | 67 |
| 61. | Ronchamp Chapel : marvelous experience in light from series of objects. | 67 |
| 62. | Ronchamp chapel from outside without penetration for people. | 68 |
| 63. | Silhouetted figures – Religious feeling with light objects in Ronchamp. | 68 |
| 64. | Variety of experience, in Ronchamp Chapel. | 69 |
| 65. | Light space – in darker surrounding. | 70 |
| 66. | Limited penetration by over hanging roofs. | 70 |
| 67. | Light space created by a window – evening experience. | 71 |
| 68. | Horizontal freedom in space : surface articulation. | 72 |
| 69. | Surface – dematerialized. | 72 |
| 70. | Light from surface – inside flows to outside. | 74 |
| 71. | Church in water – summer and winter. | 74 |
| 72. | Surface with solid flesh and born in architecture. | 75 |
| 73. | Reflections in a darker room . | 76 |
| 74. | Image on water | 76 |
| 75. | Reflections from floor surface. | 77 |
| 76. | Out to in – Transitional mind by reflecting pool. | 77 |
| 77. | Sunlight filtering through nature | 79 |
| 78. | Filtering from screen. | 79 |
| 79. | Water temple – filtered light to space | 80 |
| 80. | Porous walls – visual privacy | 80 |
| 81. | Interior – exterior yet connects with filtered light. | 81 |
| 82. | Different experience in filtering light. | 82 |
| 83. | Patterns created by filtered light. | 83 |



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INTRODUCTION

INTRODUCTION

0.1 TOPIC EXPLANATION

Architecture is another form of art. Architecture alone expresses such qualities, which are specific to it. Main difference is that the quality of penetration which could be experienced only in architecture.

Architecture has to be conceived in the form of mass and space, which are two different media. Mass being the tangible element out of these two elements. Moulding mass only ignoring the phenomenon space is pointless. It produces sculptures not architecture. To give meaning to architecture it should relate to a specific context. (A specific space.) Then only the story of architecture begins. In other words the fusion of mass and space becomes architecture. The power of most masterpieces in architecture is derived from their almost alchemical integration of mass and space. Mass was always analyzed rationally as a question of structure- the substance of building – while space was defined more mystically in terms of natural light- the energy that brought space to life. The manipulation of both structure and light was essential in making 'the space' which maintains the basic compositional element of architecture. Light itself is a quantitative. When it strikes on a surface or interacts with a mass only that quality is obtained. Quality of light is completely a result of human perception.

Interaction of this mass and space results in various relationships. Sigfried Giedion has categorized architecture in to three spatial conceptions, according to a relevant relationship of mass and space. It is the relationship of inside and outside. Here mass, which is dominant, is the "barrier" or enclosing unit of space.

Space is always accompanied by the element of light. The above relationship the inside and outside is justification of the element of light. Depending on the relationship of inside and outside the phenomenon of light and darkness also varies. The element " barrier" is therefore articulated to acknowledge these. Articulation of "barrier" contributes to various spatial qualities. According to those qualities the behavior of man within such space does vary. It is the basic argument of spatial conception, which transcends the personal feeling – Emotions in human psyche.

0.2 IMPORTANCE OF THE STUDY

Every building that is built is dedicated to the man. That is the way of life. It is the first duty of an architect to realize how to express this. Architects hope that a commitment here will be made to the well being of man. There are many ways to express this.

The space is the beginning of architecture. It is the place of the mind, man in the space with its dimensions, its structure, its light responding to its character, its spiritual aura, recognizing that whatever the human proposes thus becomes a life.

An Architect communicates in a language concerned primarily with the man in space, in variable relationships in which visual rhythm plays major role in architecture. This basic vocabulary is capable of being enriched and made still more expressive by the emotive association of light. One single piece of architecture could combine with a number of nuances of light.



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Louis Kahn says,

"No space is architecturally is a space unless it has natural light."

(Brownlee D.,1997,Pg. 170) ¹

At present situation in architecture the problem faced is the lack of this essence. Architecture is becoming only facades and no spaces. They are becoming sculptures without any sense of natural rhythms and inside outside relationships. The role of light in that sense is ignored.

"I think enough tools are available, says Fuller Moor, AIA, But unfortunately most architects are not aware that the tools exist and daylight is a fairly mysterious phenomenon. I don't think most architects understand conceptually how daylight works from the stand point of anything beyond just opening a window to let light in."

(Meiss Pierre Van,1990,Pg 121) ²

This situation has been aroused due to several reasons. Architecture is becoming more technical and the approach to architecture with new technologies make ignorance in natural materials and its healing influences. Fully engineered buildings are an example of it. Thus Emotional content of architecture is lacking.

Firstly in modern times, architecture has liberated windows from structural limitations, allowing them to be freely constructed in any size. But instead of resulting in the liberation of light in architecture, the vitality of light has now been allowed to scatter ineffectually and be lost. Modern architecture has produced a world exceeding transparency, a world of homogeneous light, bright to the exclusion of, all else, and devoid of darkness. This world of light, halation – like in its diffusion, has meant the death of space as surely as absolute darkness.

Today with the expanse of technological potential has rendered architectural lighting effortless and devoid of sensitivity, with the result that one is no longer made to feel the individual character of places. Indeed with artificial lighting, one is not even conscious of one's relationship with nature.



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Again with the improvement of artificial lighting and Air conditioning systems architects tend to install them than having such spaces with natural light. Architects always take to consideration about the negative effects of light like glare, heat etc. But they are not aware about that the ways in which to use proper lighting conditions which gives better spatial qualities.

Architects ignore the emotional content in architecture due to a lack of interest or a lack of understanding. Ignorance of this essential quality is because that, architects are not aware about the philosophy behind it. Also they haven't understood the background principles for proper manipulation of daylight.

Finally failure in designs is caused by the lack of adequate and proper attention. Architects should examine each and every detail in design for a proper product. But with the competitive environment this attention becomes less. It produces wrong interpretations in architectural compositions leading towards meaningless spaces.

0.3 NEED OF THE STUDY

In the last hundred years the development of the electrical light source has the greatest impact on light and architectural designs. Light could now be put anywhere – inside, outside, or affixed to a building – to create structures that could literally be described as glowing lanterns of night. The values of dark and light have been completely reversed. What is light during the day has become obliterated by the darkness of night, while what is rendered a darker value during the day has become a glowing membrane, due to the electrically illuminated interior.

Inside – outside relationship is fully ignored with artificial lighting. Variety of space according to the mood and function is diminishing. All the built spaces are created with the same quality as modular structures.

However people require more than reason and logic to feel alive, and to experience well being. Humans possess a feeling as well as a thinking nature, and a psyche that is far larger than the intellect, with a soul that does not need light to make outer things more lucid, but to create a resonance between that outer world and one's innermost depths. This is important to architects to search the way to approach good designs – light as an element of the meeting place of mind as well as the physical meeting of inside and outside with man's body. This study leads to capture that important phenomenon of architecture. When physical limits are minimum mind perceives inside and outside as a single entity.

With the competitive and urbanized environment of modern world, people are depressed with a hard working environment and a harmful physical environment. Modern technological buildings are not suitable to people who are mentally depressed. Physical attributes on of artificial lighting and unthoughtful appearance of natural light make severe situations. Daylight itself has a healing influence. It can be achieved by proper manipulation.

The most common practice in architecture is that placing a few windows on the wall to let daylight come in or at the end of the project to design an artificial lighting system by an electrical engineer. As most architects ignore this emotional content architecture becomes technical. It is an architect's duty to keep away from this sort of harmful approach.

Technological development influences buildings by producing monotonous architecture. All buildings are the same and spatial definition becomes the same in each building. Variety is lacking. But natural light with its changing nature can make variety to space.

Man always live with nature. Also man is a product of nature. He always interacts with natural environment. But present trend in architecture is enclosed buildings without any connection with outside. This also causes modern mental depression of human beings. Light is the main element, which encourage penetration inside with outside. Building will feel as another component in nature. This can only be done with proper understanding of the notion of light.

On the other hand daylight is important in energy conserving point of view. So maximum utilizing of daylight is demanded in this present context. Meaningless buildings are built due to misinterpretation of architecture. Architects need proper guidance of knowledge about philosophy and its practical applicability as to how it should be done. Then only architects could proceed their practicing in a meaningful manner. In this study guidance will be provided for the architects to utilize in their practice.



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Manipulating of the qualitative elements through physical components alone would not be sufficient to achieve satisfactory and healthy architecture. Thus it is an important fact to identify the philosophy behind it to achieve the qualitative attributes focusing on sensitive creations. Daylight itself only can simply do that without a cost as a free material given by the nature. Most important thing is to be aware about that, as to how this can be done. Manipulating daylight into space is an art, which architects should proceed carefully. Because daylight suddenly expresses spatial qualities to the use of the building and if it's misused the expression gives wrong meaning to the space. That kind of senseless architecture is not only harmful to the user but also it effects the entire environment. So this kind of study is important for the progress of real architecture, which our ancestors do.

When studying the historical layouts of architecture it's clear that man always lives with the nature. There is no such separation in-between nature and built space. Their buildings were just like another element in nature. Most of the activities happened in outside. This behavior pattern was identified by the architecture itself. Now it is the time to consider all those historical precedents and make them appropriate to the present condition.

0.4 INTENTION OF THE STUDY

Architects must understand that whatever they do affects the human beings, the surroundings, the spirit of place and the wider world. It has human, social, biological and ecological implications. Architecture is such a powerful agent and how it works matters a great deal. Man lives through a completely personal stream of experiences. One person's style therefore can never honestly suit another's. In this way style is personal. But by having to understand the fundamental concepts / philosophies, it will become easy to treat all those personal preferences.

AIM:

The aim of this exercise is to identify suitable architectural Concepts that would help to reduce the meaningless environment in buildings. It is not within the scope of this project to consider the total harmfulness in the buildings and to find remedies to it because of the very diverse nature of applications. Therefore this study will consider only underline philosophies and how those are refined with manipulation of daylight, to elevate emotional content in architecture.



OBJECTIVES:

The objective of this research project is to optimize on the meaningful use of daylight, which is freely and abundantly available. Therefore the primary objective would be to understand the philosophy behind the practical situation and then to identify appropriate architectural forms and strategies that would make space emotional.

Secondly, the idea is to make aware architects of the un conceptions/ mis utilization of daylight which is harmful for the built environment as well as human well being.

In the identification of such architectural forms the basic attention will be directed towards the relationship of spatial quality and daylight aiming to satisfy human needs with functional requirements of buildings.

Interest and attention, which is lacking in architects, will be improved by giving the examples, which were done previously by well-known architects in their masterpieces in architecture.

Architecture is not just another picture making, it is the sensory scene of human experiences, " the sphere of human activity" and relation to environment. Architects create images; the point is to discover the correct meaningful way as an approach to those images to become reality. This study will provide a path to that purpose.

This study aims to reach to the heart not only the mind to awake architects to realize truth-spirituality, feeling of architecture. Their moulding ability of space will be delightful with proper background, to achieve their contribution in correct way to awake another mans feelings. The ultimate product will become powerful with its spirituality.

0.5 SCOPE AND LIMITATIONS

Daylight is something, which is not stable. It's changing from time to time, morning to evening, day to day. All those variations contribute their effects on built space. But as a study it's difficult to consider each of those variations. Therefore this study intends to take daylight as its overall character.

Daylight is quantitative. When it interacts with space and human mind that quality arises. But how these quantitative attributes play in architecture is also important. Conception of space is mainly derived with quality of daylight and its way of entering to a space. So quantitative aspects of daylight are not considered in this study.

Spatial quality is rather an experience, which effects to the man's mind. It's an emotional experience, with three-dimensional entity. This study aims to express it by two-dimensional photographs and warding. So it limits the extend of experience. However the scope of this study is to analyze the philosophy behind the practical experience and to strengthen it by selected examples, which could describe its full capacity. These examples are selected to demonstrate the overall idea as a collective experience.

0.6 METHODOLOGY

All the arts are developed on a concept of space, but architectural space is experiential which combined with human feelings. It's different from other arts due to that. However in all the art forms, element of light, is expressed. This artistic creation together with light plays a major role in architectural space.

Primarily this study leads to capture that relationship of art, architecture and element of light. Analyzing of elaborate literature survey, which emphasized by few philosophers have taken to support the argument which is going to develop.

Secondly the definition of space is identified and it's briefly discussed with philosophical ideas especially according to inside and outside relationship, which artistically expressed. Space always integrates with mass. This fusion of mass and space is done by element of light. Articulation of mass with element of light is the space. How this articulation occurs. It's the way that how light penetrate to inside. The "barrier" – boundary of space, modulates penetration, which is inherent to architecture.

"Barrier" is the theme that makes the inside and outside relationship. This chapter will lead to that destination – inside and outside relationship as main three events described previously.

Then certain lighting notions are studied to give an impact as approach to built space. This stage will mainly discuss the moulding of building to take the form of a tangible mode to make relationship of inside and out side. That's the manipulation of " barrier". According to the way that an architect manipulates daylight the "barrier" – obtain different notions of light – base for inside outside relationship. This part of study will represent the basic principle of manipulation aiming to have different spatial moods. This is done by detailed analysis of such principles according to the distribution of light and its effect to mind.

Further this argument developed to study the interaction of spatial conception and daylight as a comprehensive analysis with its contribution to human feelings. This interaction of two main elements will be articulated by the moulding concepts of built form, which discussed in the previous chapter. This is done analyzing works of architects to elaborate the philosophical ideas, which were emphasized in the previous analysis. This interaction will be the essence of the whole study, which expresses how man feels space in relation to quality of daylight.

Finally study leads to achieve this analysis towards the implications of spatial quality, on the human psyche as an overall concept on each spatial conception.

According to the method of study this research aims to develop a logical argument about domain of art in architecture, difference of architecture with other arts (three dimensional space), How this three dimensionality is achieved in relation to element of light, how daylight manipulate according to that spatial requirement and finally interaction of spatial quality and daylight with emotions of human being.





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CHAPTER ONE

**Domain of art in architecture in relation to
element of light**

CHAPTER ONE

1.0 DOMAIN OF ART IN ARCHITECTURE IN RELATION TO ELEMENT OF LIGHT

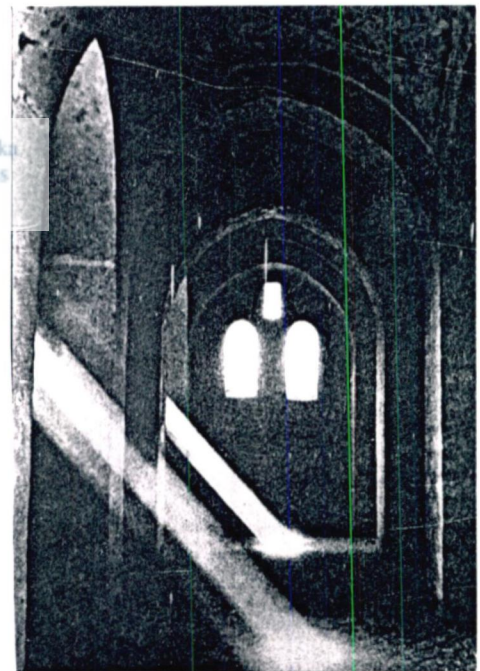
The arts whether a painting or architecture are involved with human emotional content. In this sense of art is the imbuing of matter with spirit, and it is this spirit that the user unconsciously experiences and that has a healing influence. Art is something to elevate the spirit of man. This therapy in art is the stream of great architecture. Architecture is a spatial art dealing with three-dimensional concave space. Light reveals this space with its mass. This fundamental relationship of art- architecture-light raises the spiritual character of built space.

1.1 NATURE OF DAYLIGHT



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Light is the origin of all being- striking the surface of things, light grounds them an outline, gathering shadows behind things, and it gives them depth. Things are articulated along borders of light and darkness and obtain their individual forms, discovering interrelationships, and become infinitely linked. Light grants autonomy to things and at the same time, prescribes their relationships.



(Figure 1: Daylight – Quantity to quality ,Credit: Archt. Hassan Fathy)

People might even say that light elevates the individual to distinction in the context of its relationships. Light is the creator of relationships that constitute the world. All those done by light when it hits on a surface or interacts with space until then light is quantitative.

1.1.1 LIGHT ON NATURE

The perfect creations of nature are beyond human understanding. Nature creates moods to its profile from sunrise to sunset, even in night, by moon. Nature makes massing concepts as against space with interaction of light. It is interesting to note how these masses have been articulated to react in perfection with element of light or vice versa. That is the element of light, which has articulated itself in order to face this reaction.

Light filtered, diffused, reflected through masses of nature. Natural geometry emphasized by eliminated edges of natural elements like, leaves, stalk of trees, boulders, water etc. The changeable element of light during the day and night as against the definite geometrical elements conveys a perfect drama. It arrives at a climax articulated to a point where only the edges of leaves, boulders are lit. For that particular massing formation, the particular concepts of light, which illuminates only the edges, is perfect. This happens even at night in moonlight.

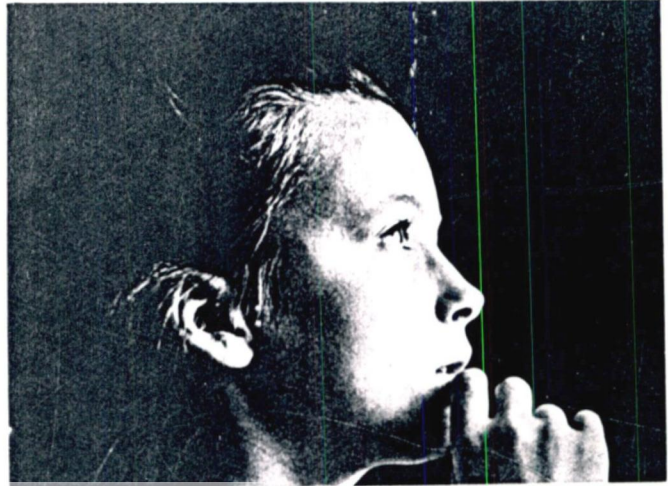


(Figure 2: Silhouetted figures of women)

This natural massing concept on nature is changing due to variable qualities of daylight from time to time, day to day, and season to season. These different qualities make different moods in that environment. When light filtering through a cloudy sky is different from a clear sky. According to the way light falls the nature changes its quality. Rainy day is a fully different experience when compare with a sunny day. Natural elements also respond to this variety in light. Morning and evening create completely changing environments to the natural elements. In winter and summer trees and other natural features express such contrasting characters. Dry leafless trees and green leafy trees make contrasting environments inherent to each season in the year. These conditions of light effect the human mind. People feel different qualities with varying nature of light. Light awakes emotions.

1.1.2 LIGHT AND HUMAN EMOTIONS

Light is the life- giving element and both in quality and quantity it is absolutely central to well being. While light affects all aspects of mind and body, its effects are most pronounced upon the feelings. Just as warmth is related to activity and light is related to the feeling realm so much so that often describe light, in terms which describe own moods, like "gloomy" or "gentle", "harsh" or "warm".



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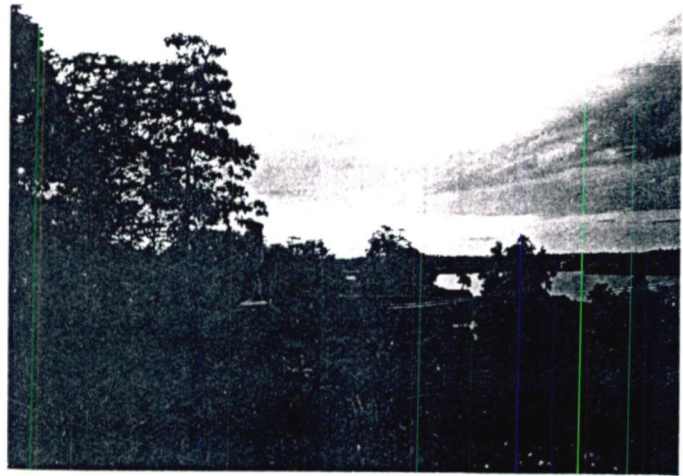
(Figure 3:Light and mood)

The experience of architectural space and light, which belongs to the realm of the senses, is quite distinct from the intellectual concept of metaphysical light, which belongs to the realm of the mind.

This metaphysical contact between space and human body by means of vibrations, register all the phenomena, which belong to the soul. According to that it is this cooperation of mind, senses and soul, which produces the total impression of architecture as a spatial experience. Some times excess amount of light with its brightness affects people badly. This causes harsh mental situations.



But the dim filtered light with dark layers makes people more calm and cool. This emotional content of light is a marvelous creation of nature. That natural principle is used in art, to elevate the emotional expressions. Happiness, sadness, is shown in art by the use of light and dark contribution. Architecture also as another form of art is essentially incorporate light within buildings to capture that emotive experience.



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(Figure 4: Evening light – emotional experience of light)

This says simply by Sigfried Giedion,

“ It is light that induces the sensation of space. Space is annihilated by darkness. Light and space are inseparable”.

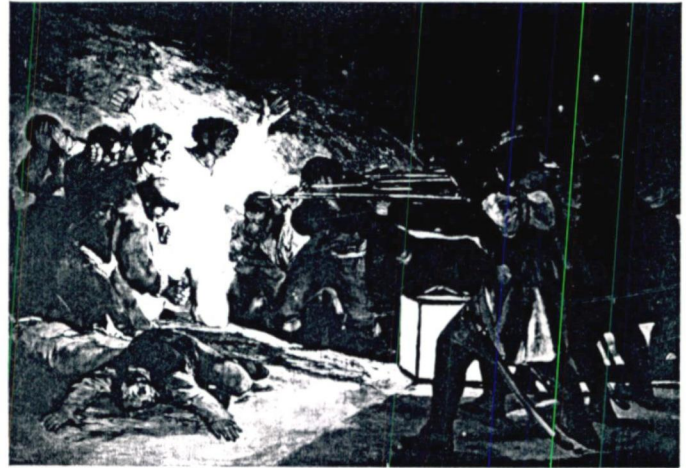
(Giedion S., 1964,Pg. 495) ³

Wherever there is “ space” the element of light is also present. If architecture is considered articulating a given pouch of space – which has its own dimensions- light is also one of the elements, which is inseparable. Therefore it follows and contributes to this articulation. In other words architecture could be regarded as working on a base that consists of space and light. Two basic conceptual ways process these creations are by articulation of space by elementary mass and secondary by variable effects of light. The interaction of these two concepts generates emotion-creating soul in architecture.

Before examining the light in architecture there should be proper understanding about the architecture as an art and how light plays in that sense.

1.2 SPATIAL CONCEPTION IN ART

Space in which man live and the activities happen is not what is treated in art at all. The harmoniously organized space in a picture is not experiential space, known by sight and touch, by free motion and restraint, for and hears sounds, voices last or re-echoed. It is an entirely visual affair, and does not exist for touch, hearing and muscular actions. Architecture is a wholesome image of all the senses.



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(Figure 5: Art- Two dimensional space, Painted by Francisco De Goa)

Painting, sculpture and architecture are three great manifestations of spatial conception. In the realm of sculpture the role of illusion seems less important than painting, where a flat surface creates a three dimensional space that is obviously virtual.



(Figure6: Sculpture: dominates the surrounding space)

A piece of sculpture is a center of three-dimensional space. It is a virtual kinetic volume, which dominates a surrounding space.

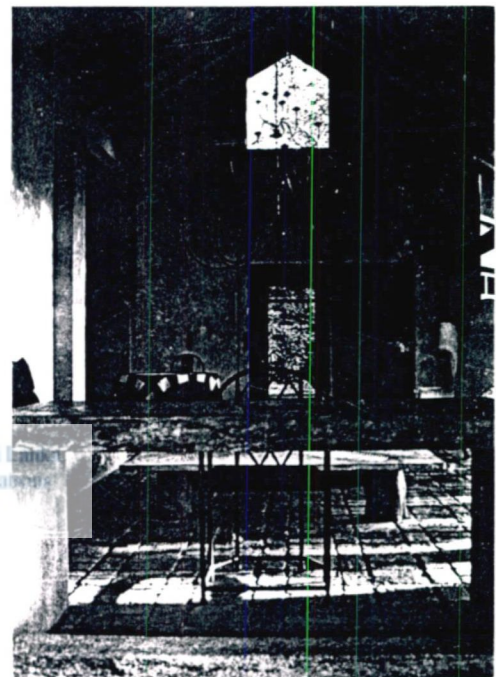
"Painting creates planes of vision or "scene" confronting our eyes, on an actual, two dimensional surface, sculpture makes virtual "kinetic volume" out of actual three dimensional material, actual volume architecture the "ethnic domain" or virtual " place" by the treatment of an actual place".

(Langer S.K., 1953,pg. 95) ⁴

Symbolic expression embodies the feeling, the rhythm the passion or sobriety, frivolity and fear with which any things at all are done. That is the image of life which is created in buildings, it is the visible semblance of an "ethnic domain" the symbol of humanity to be found in the strength and interplay of forms.



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(Figure 7: Architecture – Three dimensional form,
Credit: Archt. Geoffrey Bawa)

Art with these different spatial conceptions even expresses same qualities to observer. But architecture merely is not only for observation but also for experiencing. This experiential component the most important in architecture and it elevates with the notion of light. Importance of light in architectural space can be explained by the proper understanding of architecture art and light relationship.

1.3 ARCHITECTURE AS AN ART OF DEFINING SPACE THROUGH THE MEDIATION OF DAYLIGHT.

1.3.1 ARCHITECTURE AS AN ART

" Art the experience of something which leaves you never to be the same again. It has brought an inner step forward".

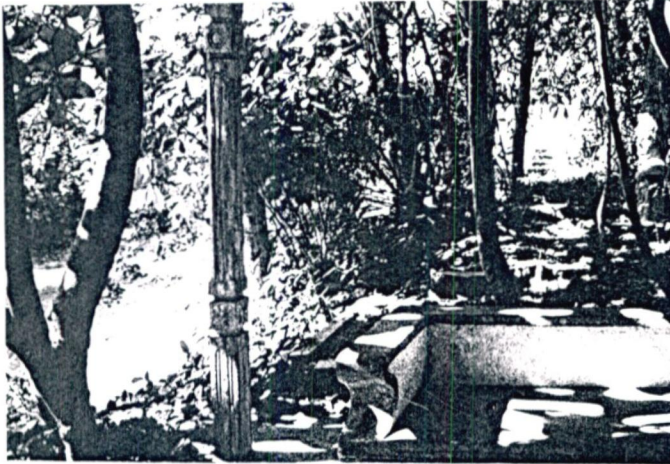
(Day Christopher,1990,Pg. 25.)⁵

Art has such profound effects on the human being on place, on human consciousness and ultimately on the world. It brings people to an experience of inner change necessary to set in. Motion of healing is the transformation of the inner self. Entering into the experience of a work of art brings us to such an inner threshold and this is the foundation of art therapy.



There are some principles in design that is common to many arts. They are basically principles of harmony, rhythm, balance, transition climax and relief. Architecture is an art that cannot be packed away when conditions are difficult. It must be appropriate for all seasons and times of day, all types of lighting and all weathers.

So architecture must therefore be merely applied and not a fine art. As in other arts primarily architecture is an image only in a drawing or a photograph. As soon as it is built it becomes the scene sometimes the scenario of comings and goings, of gestures even of a succession of sensations.



Painting, sculpture and music also have their spatiality but this is defined from the exterior, offering only the possibility of mental penetration. Architecture is the art of hollow. It is defined both from the interior and exterior. Walls have two sides. People penetrate it with their body and not only with the mind. Architectural space is experiential. Penetration through space is the most important consideration in architecture.

(Figure 8: Penetration in architecture, Credit: Archt. Geoffrey Bawa)



Art can be identified as the most finest and subtle medium of expression, due to this communication takes place automatically. Like wise architecture also acts as a medium of expression. It can be identified as the most universal expression of design. Mans basic need of shelter is transformed into the form by architecture. This communication of messages is delivered to the beholder by the mass and space. It communicates expressive qualities to the human mind.

Every custom and social function has a symbolic meaning to it. Art is full of symbols. They express their ideas symbolically in their own way of style. For example drama- movement, Architecture - space. Light reveals these symbols in art and architecture. Light is used to elevate this expressiveness and depth of art and architectural forms. Light always add life to art. This life, which is given by the light, is the essential phenomenon of all arts to capture observer's eye. Notion of light in art will communicate importance of light in architecture.

1.3.2 NOTION OF LIGHT IN ART

Light is the giver of all presence. Darkness and shades are the outcome of the light. Light is the maker of shadows. A space or a picture is identified, by the lighting qualities which, inherent it. Play of light gives the beauty to any natural setting or built form. Viewer's eye are normally attracted by the illumination levels in a picture and focused on the highest place or lighting toned area on it.

The art whether painting, architecture even cooking or gardening are involved with people. In this sense art is an element, which connects with spirit, and it is this spirit that the user unconsciously experience and that has a healing influence. In this healing process light has contributed to a great deal, especially in arts like painting, drama, film and architecture. In a film most dominating character is focused by bright spotlights to advance it to the viewer from a distance. Such focusing objects are used in the building to get the attention of the user. Light is used in motion pictures to heighten the most specific incident in a rhythmic process.



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Painter uses light to counterpart on one spot leaving the rest in semi darkness. They use this method to show expression in human feature. They also show the wealth of textural effects that could be produced by this special lighting method.



(Figure 9: Painting by Lucky Senanayaka - Space in a jungle)

Well known artist Lucky Senanayaka produces powerful paintings using effects of light. His paintings mostly engage with natural experiences and the spatial quality is highly expressed. He uses effect of light and dark to enhance interesting spatial qualities in jungles.

In Jan Vermeer's paintings the lighting of interior is best documented. Many of his pictures were painted in a room with windows stretching from one side wall to other.



Vermeer worked experimentally with problems of natural light. His easel almost always stood in the same spot, with light coming from the left and his usual background was a white washed wall parallel to the picture surface. In some of his paintings the background was just the wall but nevertheless it gave the impression of the entire room because of the reflections made by the light.. Viewer are aware of the strong light coming from the other walls which give light colour to the shadow, which are never colourless, even when the painting shows only one figure against a height rear wall that experience on the entire room.

(Figure10: A Vermeer's Painting with light)

Painters enhance the space by element of light. Light makes shallow or deep spaces with a painting which demarcated the entire three dimensional character on two dimensional paper by playing of light and shadow on objects of the painting.

In paintings space which is on two-dimensional picture plane can be articulated properly for human eye. But in architecture light has a big rôle to play for experiencing. Light on the space affects the human behavior. So studying light in architecture may clarify how architects are involved in that aspect of behavior and light.

1.3.3 LIGHT IN ARCHITECTURE

Light and architecture have been profoundly related since the beginning of time. This relationship beginning with the light emanating from the hearth and the cave dwelling has comprised a deeper and much more integral inter dependence than is frequently understood. The relationship of light and architecture has continuously made evident the dialogue between society and light, whether a literally translated relationship with architecture as with the Egyptian and Greek temples. The most abstract expression of the 16 th century baroque architecture is the formal, spatial and material qualities of architecture of the present



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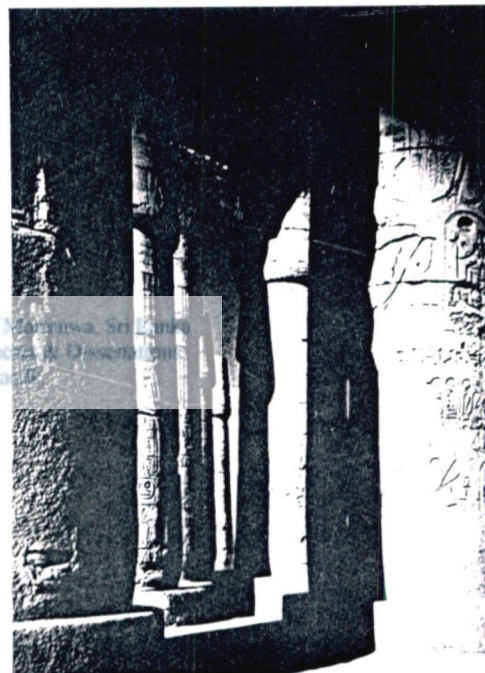
The role of light has played in architecture over the centuries have varied from cognitive to the poetic. Light was often distributed in space to provide clear and easy vision, and to give us information about the world. But it has also been shaped into sensuous and beautiful phenomena meant to be deeply felt to their own sake and for the echoes they awake in the innermost part of the soul.

Light is decisive important in experiencing architecture. The same room can be made to give very different spatial impressions by the simple expedient of changing the size and the location of its opening.

Inspiring examples of this expressive treatment of light are plentiful, and span the history of the built environment. The most brilliant example of the symbolic use of light as a representational medium in architecture is in the Egyptian period. The symbolism and imagery of light and dark was the ideal vehicle for the expression of religious mysteries and were used to inspire devotion.

Egyptian architecture and art is characterized by movement, emotion irrationality, spirituality, motion, atmosphere and all were represented in the genius handling of daylight by Egyptian architecture. A shift from this more spiritual use of light occurs in the Neoclassical time where architects exploited light to its full advantage using light and shadow to clarify their geometric forms and spaces, which were based on the dynamism and rules of nature.

The age – old desire to render buildings luminous reflects a basic human fascination with the exalting beauty of radiant things. Even in its simplest form, light is the most spectacular experience of the senses, with a shelter intensity that causes static forms to leap to life at a perceptual level. The all of this life giving light was not essentially an aesthetic appeal, but a primal identification for as Carl Jung has pointed out, " The longing for light is the longing for consciousness."

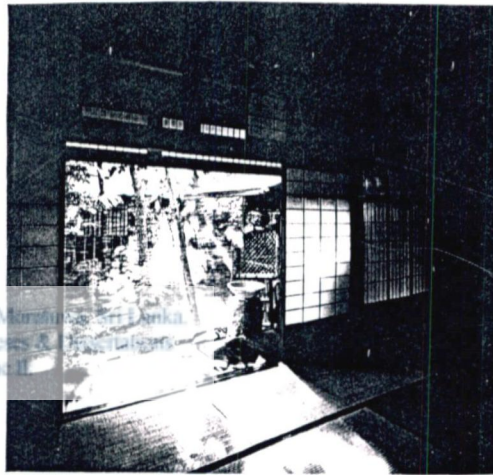


(Figure 11: light in Western architecture)

Architecture – which endeavors to slice off some of this omnipresent light, and sustains its presence in a fixed place, which has sought, through the ages, to carefully ensnare this light with all of its vitality intact – is it not that which, purifies the capabilities of light, bringing light to consciousness of people. Light gives, with each moment new form to being and new interrelationships to things, and architecture condenses light to its most concise being. The gradation of space in architecture is simply the condensation and purification of the power of light.

Such perception as these of the relationship of architecture and light are one not so much constructed from ideas, perhaps, as they are drawn from the layers of spatial experience that have been etched in to physical being. Experiences say of Japanese architecture – the teahouse for example where space is portioned simply by means of paper stretched over a delicate wood frame. Passing through such a partition light quietly diffused in to the interior, to mingle with darkness, producing a space informed by monochromatic gradation.

Japanese architecture has traditionally endeavored by means of its sensitive technology, to break light down to its individual particles. The subtle changes it achieves at the level of tremulous energy bring space almost imperceptible into being.



(Figure 12: Light in Japanese architecture)

Western architecture ones used massive stonewalls to partition the interior from the exterior. Windows let into walls so thick as to seem a rejection of outside world were small and severely constructed. Such windows, almost more than they allowed light to enter, shone with intense brilliance as if they were the very embodiment light. They expressed perhaps the fundamental desire of man inhabiting the darkness, for light. The brilliance of a shaft of light, penetrating the profound silence that darkness, amounted to an evocation of the sublime. Windows are made not for visual entertainment but purely for the unmediated penetration of light and light that pierced interior of architecture produced a space of solid, resolute construction; the severely built openings caught the monument of light with precision. Space was carved like a sculpture in the making by a line of light that pierced the darkness and its appearance altered with each successive moment.

1.4 CONCLUDING REMARKS:

Painting reveals its quality by the illumination. But architecture is complete version of light and shade. This light and shade enhances the three- dimensionality of space. This chapter concludes that light is the mediating force that defines the architecture. Daylight when it strikes on an element of space or when it passes through darkness creates such quality in architecture. Quality of daylight is common to nature as well as architecture. Architects interpret natural ways and means to achieve better spaces in architecture by emotive use daylight. This spatial definition is achieved by the way that light reacts on mass. This contribution of light in the definition of space will be discussed in the next chapter.





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CHAPTER TWO

Contribution of light in the definition of space in architecture

CHAPTER TWO

2.0 CONTRIBUTION OF LIGHT IN THE DEFINITION OF SPACE IN ARCHITECTURE.

As described in the first chapter the space in architecture has a strong argument when it is compared with the space in other forms of arts. In architecture an important character is the three dimensionality of space. It is important to study qualities of this three dimensional space as a proper background to establish a spatial conception.

2.1 NATURE OF SPACE

Three-dimensional space in architecture is important due to its intangibility. This intangible component is the basic essence in space. Space always carries human experiences. Experiential nature in space occurs with the perception. When perception becomes perfect the space creates meanings. This meaning in architecture is the main base for human behavior. Light again is an intangible element, which helps to strengthen the intangibility of space.

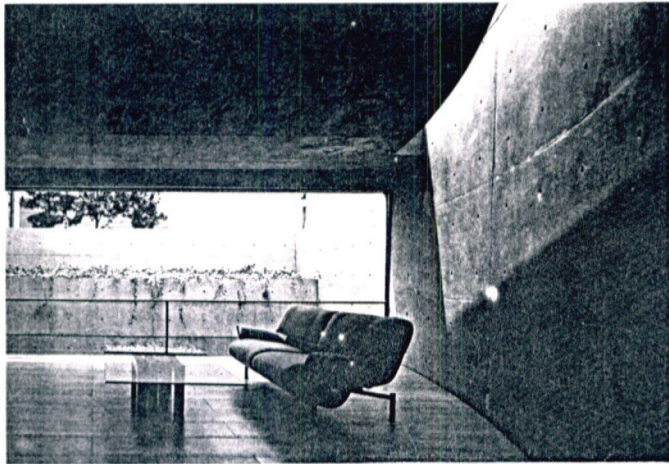
2.1.1 INTANGIBILITY OF SPACE

It is possible to give physical limits to space, but by its nature, space is limitless and intangible. Space dissolves in darkness and evaporates it in infinity. To become visible, space must acquire form and boundaries either from the nature or by the hand of man.

The intangible phenomenon of space has always fascinated man – even disturbed him. As S. Giedion says,

" In realm of architecture, space is experienced by means of observation, in which the senses of sight and touch are interlocked. In the first instance this is a simple statement of fact but through the relations of the most diverse elements and the degree of their emphasis – straight or curving lines, planes, structures, massivity, proportions, forms, of all kinds - a matter of simple physical observation can be transposed to another sphere. These diverse elements are seen suddenly as a single entity, as an oneness imbued with spiritual qualities. This transformation of a physical fact into an emotional experience derives from a higher level of our faculty of abstraction."

(Giedion S., 1964, pg. 495) ⁶



Though space is intangible, between man and space there is a psychic relationship. This changes continuously sometimes in nuances, sometimes fundamentally. The relation between man and man-made space appears in his space conception. Like his attitude towards the state and his attitude towards the world the latter is bound up with the nature of his period.

(Figure 13: Intangibility of architectural space)

The space is intangible. Building cover is tangible. Architecture has been created to define intangible space in-between building cover. Without defining this inside space, using building cover only, people can't experience it. When they trap this inside space within building cover, it will give a completely different experience contradicting to outside space. But it will give a look of the same intangible space inside and outside of the building cover. This intangibility of space is the most important thing in architecture.

Lao Tzu (550 BC) has pointed out this as,

Thirty spokes converge upon a single hub
It is the hole in the center that the use of the car hinges

We make a vessel from a lump of clay
It is the empty space within the vessel that makes it useful

We make doors and windows for a room
But it is the empty spaces make the room livable

Thus while the tangible has advantages
It is the intangible that makes it useful

(Ching Tao Ten, 1961) ⁷

The intangibility of space is enhanced by the element of light. Light penetrates through tangible enclosing unit (boundary/barrier) to inside. Man can't touch this element of light. But he feels it. Light seeping through cracks of walls, just like water flows in. But the difference is intangibility. Though this intangible component is untouched it can be felt. Sight always catches that. Mind feels that. This sensual application of space is the perception. Light makes perception a meaningful way.

2.1.2 PERCEPTION OF SPACE IN ARCHITECTURE.

Quality of the space relates with the human emotions. So it is important to examine how the emotional responses obtain (generate) by the play of architectural elements in a space. Emotions are the feeling, which originate in human psyche and when they connect with sensation it is usually referred as perception.

Perception is becoming aware of the external world through five senses, in which according to Aristotle's subdivision of sight, hearing, taste, and touch. Perception mostly relates with the orientation, which represent the sense of above and below in front and behind or left and right. Visual perception occurs through other senses as well. The sight identifies the depth of a space, the nature of its limitations, and the object in space. When light is there definition of space is clear. Personal memories and personal development of the individuals has a role to play in this perception. Spatial perception is dependent on the relevant position of the observer and it changes as his motion. Perception, motion, light are interrelated elements.

Following statement, which was said by Yi Fu Tuan , explains how visual perception is related with space, man, light relationship,

" Frontal space is primarily visual. It is vivid and much larger than the rear space that we can experience only through non visual cues. Frontal space is illuminated because it can be seen, back is dark, even when the sun shines, simply because it cannot be seen."

(Tuan Yi Fu, 1981,Pg. 40) ⁸

When the space is experienced by means of observation it is motivated by the interlocking of the sight and touch. Light plays a major role in this sense. It is the light that includes the sensation of space. Space is annihilated by darkness. Light and space are inseparable.

“ If light is eliminated the emotional content of space disappears, become impossible to apprehend. In the dark there is no difference between the emotional evolution of a chasm and of a highly modeled interior.”

(Giedion S, 1964,Pg. 495) ⁹

When sight catches the quantity in space, the mind converts it to a strong feeling with quality. Perception occurs not only by sight, but also it's a combination of touch, smell, hearing etc.

“ Spatial perception is a product a service of partial perceptions. Because it is bond to the three dimensionality of volumetric construction, but it catches only part of the potential range of the perception.”

(Zevi Bruno, 1957) ¹⁰



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Perception of space could not be bound to a single viewpoint. Movement played a decisive role in the perception of space.

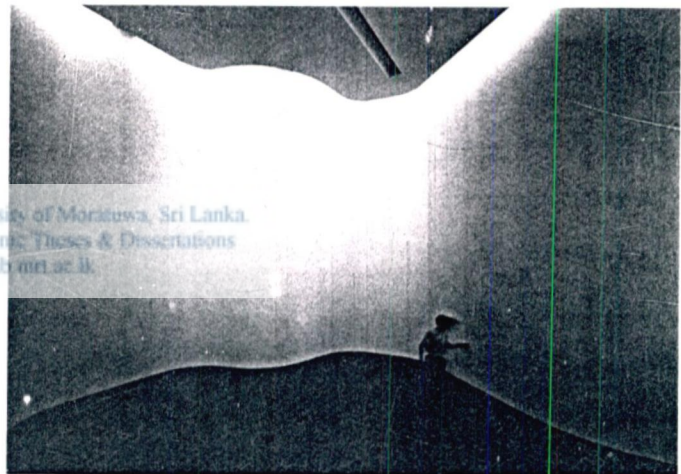
Movement encourages with the force obtained by the light. Light and human behavior are related incidents. Behavior changes according to the way light falls on to space.

2.1.3 HUMAN BEHAVIORAL PATTERN IN SPACE

Architecture can be described as a spatial drama. It gives rhythmic movements. This movement flows from one to another creating rhythm while creating identifiable character. Beholder experiences architecture and grasps the inherent meaning and it is a spatial movement. Because of this experience he can identify the expression of the space.

Everywhere a person goes he creates a space in and around him. When space is rich with feelings and emotions it gives rise to architectural space. Space enhances the movement, flow and rhythm of an architectural product, which fascinate the visual environment. When a person moves within a space, it makes a journey with him and contributes to transform him, by way of its symbolic expression. This contributes in serving the purpose and the desired experience. It is sensed that architecture has an in built self- perpetuating quality. Architecture being an art of materializing space to house patterns of behavior of people, cannot be just a mass without life, it must induce behavior.

People create spaces to house their intangible activity pattern to behave comfortably to achieve their objective goals; people look for different qualities of environment, for different patterns of behavior in respond to activity pattern.



(Figure 14: Man and His behavior on space)

The following statement by Yi Fu Tuan proves it,

" Space has temporal meaning in the reflections of a poet, in the mystique of exploration, and in the drama of migration. Space also has temporal meaning at the level of day to day personal experiences"

(Tuan Yi Fu, 1981,Pg. 126) ¹¹

This spatial movement and experience has been permanent in people's mind due to the expression of space. The light enhances these different expressions created within space. Mostly in religious spaces this can be experienced well. The light with its changing environment guides man who enters to such space. Light attracts a person. Sometimes light forces a person to a definite path. Behavior is always a result of the conversion of mind. This change in mind relates with the sight, which occurs due to different lighting qualities. Calm or violent, sacred or profane quality depends on the abstracted picture of the mind. Quality is personal and depends on how man perceives it. This picture making process is the composition in architecture. Articulation of mass and space with element of light in a defined context processes this emotionally.

2.2 ESTABLISHMENT OF SPATIAL CONCEPTION

When regards the element of light it has different aspects in space making. But with the way light enters to a building and the way of its behavior, space also changes. This overall principle is important to identify this relationship.

2.2.1 EXPRESSION OF SPACE IN TERMS OF A CONTEXT

Space could be created not only by a particular constellation of natural objects, but also by a constellation of man- made components (in other words built forms) do establish a dominant frame work to a context.

The origin of architecture is the source of its nature. But in every aspect of contextual design an architect must recognize that whatever does effects the human being, the surrounding, the spirit of places and wider world. It has human, social, biological and ecological implications.

Historically man built their dwellings as same as natural elements. They were enclosed units, which were visible as another element in nature. People were capable to understand about nature and its context. Darker interiors at such places created intimate living environments harmonized with the context.

" Architecture is but a part of the built environment. Inside a building parts of the building become the whole environment, outside it forms only a part of our surrounding."

(Day Christopher, 1990,Pg. 13) ¹²



(Figure 15: Interpretation of nature in architecture, Source : Architecture without architects)



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(Figure16: Space in a context)

Some times their form, uniformity or lack of fenestration conceals what goes on inside big buildings like this are like lifeless giants.

This statement clearly emphasize that the need of the relationship of manmade space and natural space. Space is the location in which things can happen, in which living things can be. Buildings are objects from the outside, space within. Their presence is made even stronger by what goes on within them.



When there is an understanding of natural patterns contextual relationship was automatically obtained. Light has a penetrable quality to enhance this harmonizing nature.

Because the inside space, activities and qualities of a building and the outside surface and appearance are interrelated with the whole building, all the activities it generates, need to be involved in this great conversation. The conversation between idea usage and place, between what will be and what already was between physical substance – the materialization of the idea- and invisible spirit of place – the spirit brought into being by the physical substance of the surrounding. Light makes this conversation dynamic and enhances the spirit of space.

Again when object is dominating or contrasting over a context – light does it more effectively. Outer appearance of an object in nature is enhanced by the daylight. Also light enhances forms which are in outside and inside of a building.

2.2.2 LIGHT, SHADOW AND FORM



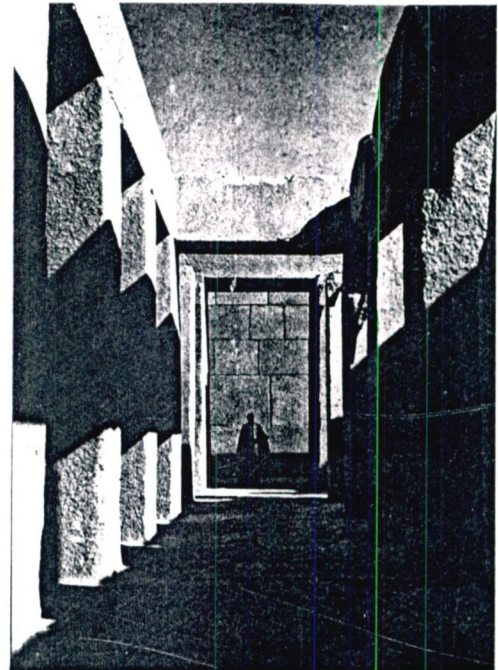
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Light gives objects, existence as objects and connects space and form. A beam of light, which is isolated within architectural space lingers on the surfaces of objects and evokes shadows from the background. As light varies in intensity with the shifting of time and changes of season, the appearance of objects are altered. But light does not become objectified and is not itself given form until it is isolated and accepted by physical objects.

Light attains significance within the relations among objects. In the instant when one of those fluid relations is fixed, all relations are determined an instant of light is simultaneously the instant of that light's own extinguishing. At this boundary between light and dark, the individual object is articulated and given shape. When objects are articulated in this fashion, mutual relations are established among them, and a chain of elements comes into being. Nonetheless since the tendency towards generalization is always concentrated within the individual elements, this chain is the realization of a whole permeated with the aesthetic awareness existing in the inner world of a single human being.

In medieval monasteries the building is of rough stonemason and the treatment of the openings was totally devoid of ornament. But the interior imbued with a feeling of great power. In the deep silence of the place, its aware of something penetrating, something transcending the severely of religious precepts.

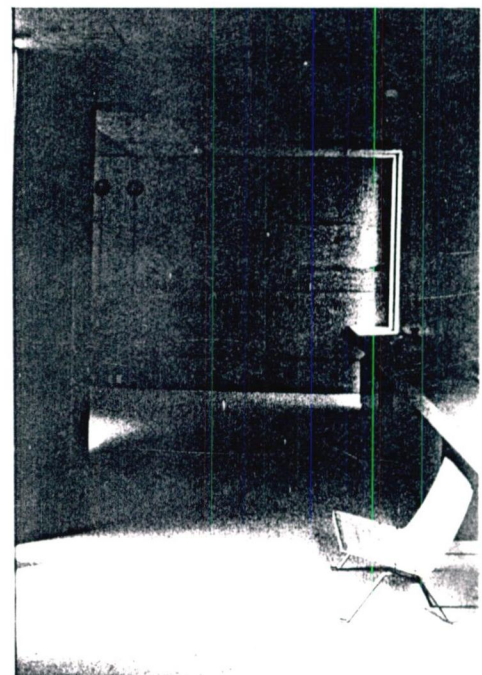
Light patterns and overlapping relations between them and various parts of the design were very important to architecture, which actually can come in to being only through the establishment of mutual relations among parts made possible by light changing with the passage of time.



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(Figure 17: Overlapping shadow on form of masonry)

In Zen Buddhist thought, space is said to come into being at the boundary where material things vanish. In this Zen context space is non-existence. In size and expression, the traditional tea ceremony room in Japan is a microcosm revealing this boundary on the edge of vanishing. A person sitting silent and contemplative in such a space has the feeling of experiencing limitless size within the interplay of light and dark.



(Figure 18:Light and shadow – Form making)

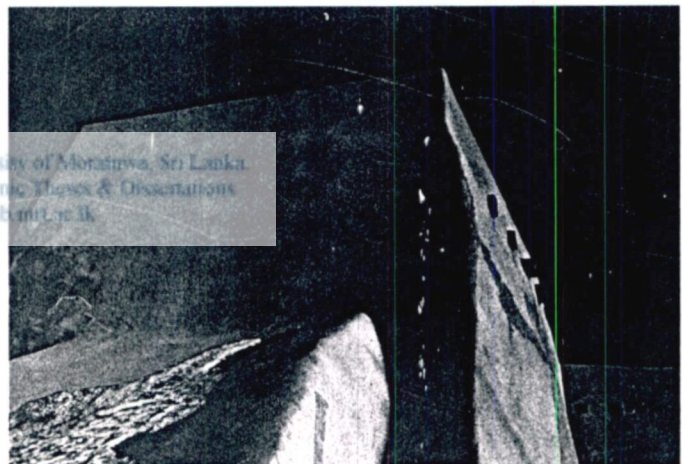
In all these incidents what is prominent is the fusion of mass and space. Fusion here occurs due to the combination of light. Light is the maker of this fusion in architectural composition. That is the point where the quantity of light becomes the quality.

2.2.3 FUSION OF SPACE AND SPACE

"Architecture is the art of surfaces around space. The exterior manifestation of architectural mass is a secondary result of the interior mood of the space contained. Good architecture is manifested by the integration of the interior and exterior spatial cells."

(Cornelis Van de Ven, 1980, pg. 110) ¹³

Main categories of architectural elements base upon the concepts " mass", "space" and "surface". The surface may act as a boundary to masses and spaces. Space and mass are two distinctive elements. Each element has its own inherited qualities. The intangible element is captured, enclosed and articulated by virtue of the tangible mass. Then only architecture comes in to being.



(Figure 19: Fusion of mass with the element of light.)

Therefore the two are interdependent substances where an element cannot be treated separately merely because it then ceases to become architecture. The Slightest changes in the mass means a change in the space. Francis Ching says,

" As space begins to be captured, enclosed, molded and organized by the element of form, architecture comes into being."

(Ching D.K.,1974, pg. 108) ¹⁴

One should consider the ultimate result of the fusion between mass and space, rather than any one of them in isolation. Any mass cannot fit into any context of space. Each element has its own dimension. Therefore for a perfect fusion each other should acknowledge their dimensions. Then only it becomes complex work of art. When the fusion is perfect it touches heart of man. In other words " dimension of mass" is compatible with " dimension of space". " Architecture is an emotional phenomena", so says Corbusier. He expresses a correct fusion as a vibration in space.



Architectural organization of elements is explained again by Rudolph Arnheim that is for comprehension of a visual field to be efficient, one tends to organize the elements into two groups, one is positive elements that are perceived as figures and other one is negative elements that provide a background for them.

(Figure 20: Mass and its relation to space)

Therefore ultimate perception of this composition depends on the more interaction of space and mass or negative and positive.

" In all cases, however one should understand that figures, the positive elements that attract our attention, could not exist without a contrasting background. Figure and their background, therefore are more than opposing elements. Together they form an inseparable reality unity of opposites, just as the elements of form and space together form the reality of architecture."

(Arnheim Rudolf,1977) ¹⁵

The negative that is space is not negative. It has its own forces. If space were empty without any force the mass on such space would have been meaningless. Therefore space has its own limits and body by which it is not indefinitely large or small. It is also owing to this contrasting power of space that the universe as a whole occupies a finite space. Therefore the thinnest material of " boundary" or the erection of wall has an impact on the space.

2.2.4 MANIFESTATION OF ELEMENTS ON THE BOUNDARY / BARRIER

Same spatial organization may possess very different qualities according to the concrete treatment of the space – defining elements- Barrier/boundary.

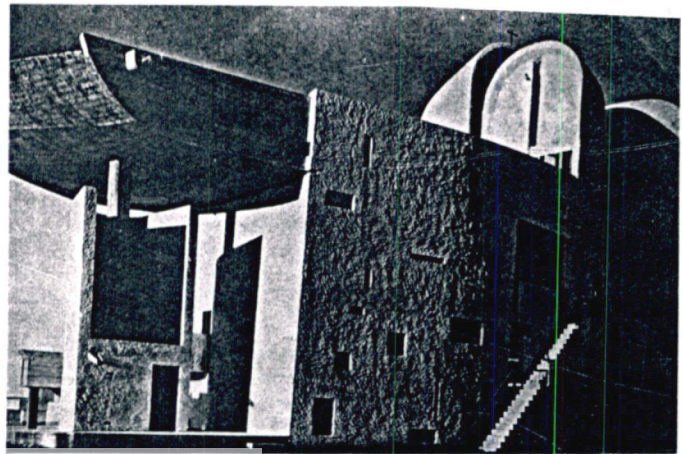
The distinctive quality of any built space is enclosure, and its qualities are determined by how it's enclosed. Enclosure is a distinct area, which is separated from the surrounding by means of a built boundary.

Therefore boundary is an important thing. It distinguished a notion of inside and outside, and it seems to be a product of the forces of inside and outside.

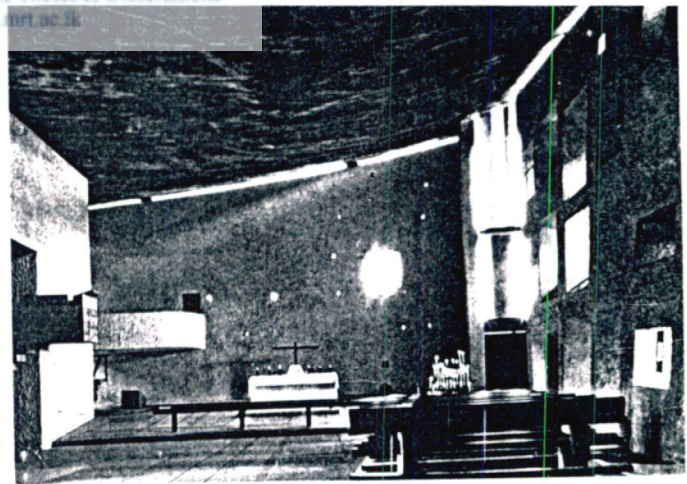
Some expresses this as a "contour rivalry" where the common boundary is shared by the inside and the outside.



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Boundary determines the degree of enclosure (openness) as well as the spatial direction, which are two aspects of the same phenomena. The character of a man made place is to a high extent determined by its degree of "openness".



(Figure 21: Barrier- Façade of inside and outside , Ronchamp chapel, Archt. LeCorbusier)

Holes in a massive wall give emphasis to enclosure and interiority, where as the filling of a skeletal wall by large surface of glass "dematerialize" the building and create an interaction between exterior and interior.



(Figure 22: Barrier with holes)

There is generally less tension in the activities of acceptance than there is in rejection. To accept is to affirm and with this one tends to put down one's guard.



(Figure 23: Barrier dematerialization)

However, if everything is allowed to penetrate into the interior, the internal world disintegrates and its centrality collapse. This results when there is an absence of tension in the activities of acceptance. Therefore that tension should be as present in acceptance as it is in rejection. In architecture this tension signifies an intense confrontation between the inside and outside. Thus those places where the internal order meets the external order that is the area of fenestration in a building are of extreme importance.

In this sense walls play a dual role serving both to reject and affirm. Walls are calculated to accept even as they reject. The amorphous and immaterial elements of wind, sunlight, sky and landscape are cut out and appropriated by walls, which serve as agents of the internal world. These elements are assimilated as aspects of the architectural space. This tense relationship between inside and outside is based on the act of cutting. The most austere the wall is, even to the point of being cold, the more it speaks to man. At times it is a mirror in which landscape and sunlight are dimly reflected. Light that diffuses around a corner and gathers in the general darkness contrast strongly with direct light, blend and enrich the space.

Barrier is the face of meeting in outside and inside. Space is identified as a consequent event of this inside and outside relationship. This relationship is achieved by this manipulation of barrier. It is the foundation for an establishment of spatial conception in architecture.

2.3 SPATIAL CONCEPTION AS AN INSIDE OUTSIDE RELATIONSHIP

In architecture, the inside could be a total contrast to the outside, or it may be so, like in the orthodox modern architecture, a continuity of the inside and the outside. Therefore the relationship of inside and outside may be contrasting phenomena or sympathetic phenomena. These adopted relationships are achieved mainly through the articulation of the "barrier". Two extreme examples are a solid wall and a transparent wall. Within these two extremes "holes in the barrier" come into being.

The significance of these holes depends on the established relationship between the inside outside. Are they mere holes, or do they give any kind of visual independence? As soon as a hole is cut out the space starts flowing out. In other words, a link between the inside and the outside begins to operate. Not only that, sometimes this relationship is manifested in so many other ways as in the case of two unattached linings, they produce an additional space in between. The two layers could be more or less contrasting in shape, position pattern and size.

Other than the above phenomenon of the barrier, subtle nuances are used for further articulation of this barrier.

" Designing from outside in, as well as inside out, creates necessary tensions, which help to make architecture. Since the inside is different from the outside, the wall- the point of change –becomes an architectural event. Architecture occurs at the meeting of interior and exterior forces of use and space. The interior and environmental forces are general and particular, generic and circumstantial. Architecture as the wall between the inside and the outside becomes the spatial record of this resolution and its drama."

(Ventury Robert, 1966) ¹⁶

Sigfried Giedion has divided architecture into three main spatial conceptions according to the relationship of inside and outside. They are,

1. Volume in space. – No interior. The barrier becomes a solid volume. Therefore it is not further hollowed to contain an interior space. Yet it has an impact on the outside.

E.g.: Pyramids

2. The inside and then outside do exist. Yet it is not visually related. The interior is in total contrast to the outside.

E.g.: Pantheon

3. The inside and the outside are related in a definite pattern. Under this conception two major sections could be identified.

- a. The inside and the outside are related through a defined way
- b. The inside and the outside are related to such an extent that is one

E.g. Lunuganga, Diyaububula

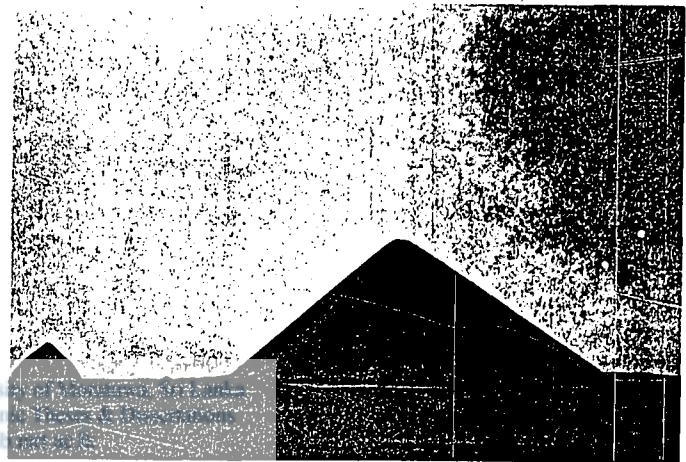
In-between these there are numerous variations.

2.3.1 CONCEPTION 1: VOLUMES WHICH DOES NOT CONSIST AN INTERIOR (ELEMENTS IN SPACE)

Volumes or masses in space are the elements in space, which does not consist an interior as such. These built forms consist of insignificant interiors compared to the purpose it was built for. It may be called as an extroverted interior, which is mainly worked out to create an impact to the exterior. Most of these elements (built forms) act as obstructions against the surrounding space. They do not make any interpenetration to the interior. Therefore basically they could take the form of silhouette against the skyline. Therefore the stark edge profile becomes an important critical element. The emphasis or the value of the mass is therefore revealed by the edge profile. In these built forms the story or the soul lies on the edge profile. So the elaboration of edge is important.

The mass or the built forms emanates its power to the outside and thereby create a particular exterior. When consider of a pyramid, the context is a dessert, which hold an extremely bare quality. The bareness is so dominant. Physical structure is unable to express itself without the domination of the bareness of the site.

Domination of the structure is due to the reflections and shadow of light. These elements are identified as sculptural forms with vast deserts and the quality this solidness is enhanced by the light from clear sky. .



(Figure 24: Element in space)

2.3.2 CONCEPTION 2: EXTERIOR AND INTERIOR ARE TWO UNRELATED CONSEQUENT EVENTS

This spatial relationship includes interior as well. Yet exterior and interior are two extremely different events. They are not in sympathy- but in contrast. This concept is further reinforced by visual relationship between the two zones making them insignificant. Eventhough the exterior and interior are contrasted – they have to be complemented to be a unique built form within a context.

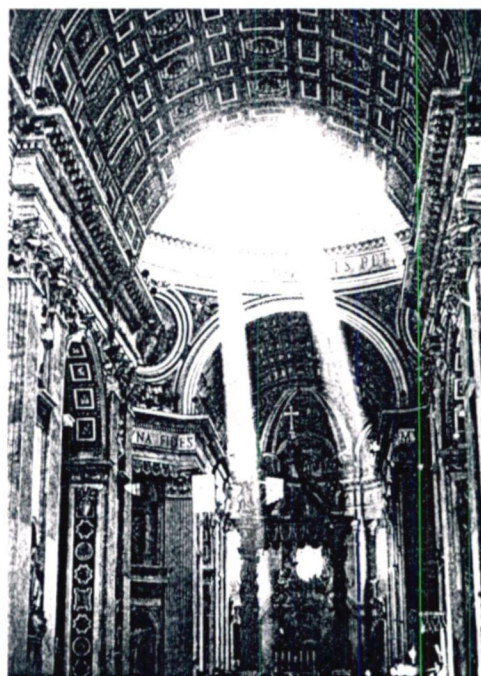
This relationship about two contrasting events, the lighting on exterior and interior are not related each other. If the exterior form is under direct sunlight the interior gets diffused light and the objects of the room and even the interior wall surface and the details are all in silhouetted dark. To reinforce the fact if an exclusive interior – the visual relationships are not encouraged and therefore cannot compare the interior to the exterior at one movement. The exterior and interior are two consequent events.



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(Figure 25: Inside and outside as two different events)

Skylights, atriums are the elements, which substitutes the window. In large modern buildings – atrium with a lobby becomes an essential part. They tend to forget the exterior altogether. Also “semi transparent element” plays a big role. Total solidness like pyramids is not a part of this, or totally transparent elements such as a wall with clear glass windows. The transition from the exterior to interior is also a major event. At times it is an event of just piercing through a door, which is on the non-penetrable solid facade wall. In this sense the opening which light pierced interior becomes an object or series of objects.



(Figure 26: Light as an element)

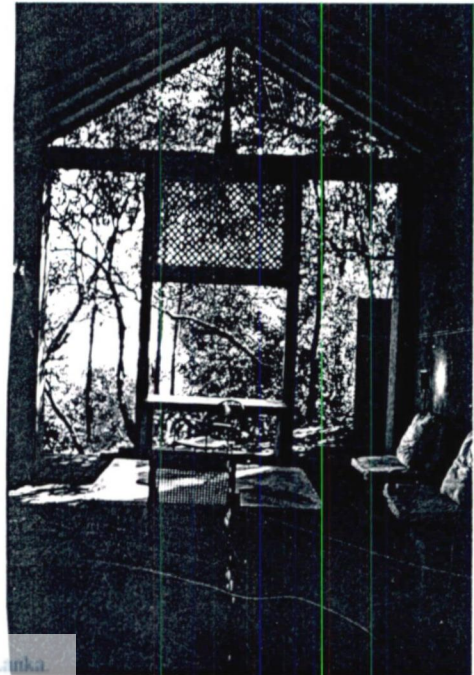


2.3.3 CONCEPTION 3: EXTERIOR AND INTERIOR ARE RELATED INTERDEPENDENT EVENTS

In this event mass is more interpenetrating. Opening on the wall is the main source of light, which has other tasks also. It provides a strong relationship with the outside. Therefore inside and outside is perceived as not two separate consequent events. The mass could be interpenetrating to an extent where it becomes a framework or a netty structure, which allows the light just to filter through.

When man moves on the space that the feeling of inside and outside may be same in this event.

That means two elements- interior – and exterior flows together to harmonize as one space



(Figure 27: Conception three – Barrier as a framework)

This may be done using extrovert spaces like verandahs, colonnaded structures. Etc. Transitional place in-between interior and exterior is important in this case. Some times the transitional space is that only a surface (wall), which bonds two spaces together.

The way of light as directed and modulated is of the utmost consequence on this space conception that gives flesh and bones to an architectural complex.



(Figure 28: more penetrable inside out side relationship, Diya Bubula, By Lucky Senanayake)

This event in architecture can be considered as the relationship of contained and container with outside. All the out side elements can be considered as the part of inside.

" The market of the sun has come into my room and the room into my buzzing head"

(Bachelard Gaston, 1969,Pg 226) ¹⁷

Most restricted intimate space even in this dialectics of inside and outside relation, which draws its strength. People inside, in this event don't feel as they have a boundary. Solidity in the barrier is minimized to have a better connection.

2.4 CONCLUDING REMARKS:

Light contributes considerable service to the spatial definition in architecture. Architectural space is intangible. Light also is an intangible element. Intangibility within space is perceived by man and it's a personal feeling. Human behavior pattern changes according to that perception. Light is important for establishment of this process, which is inherent to architecture. Space always relates to a specific context. This contextual relation elevates by the element of light. Light and shadow with built forms contribute this contextual relation. When light falls on mass and space, quality of architecture creates. Main aim of architecture is to achieve that task. It is done by the manipulation of barrier. In that sense barrier has decisive role in architecture. Barrier is the converter of quality in space by the relationship of outside and inside. Next step of the study is to understand how this so called barrier is manipulated to have daylight in to built space.



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CHAPTER THREE

Daylight on built space: Manipulation of barrier

CHAPTER THREE

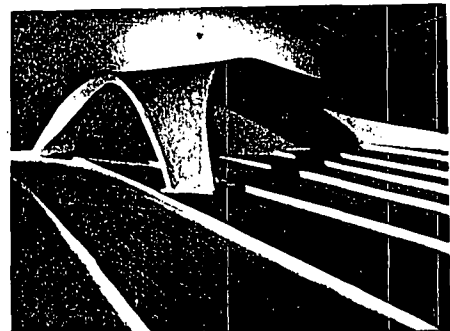
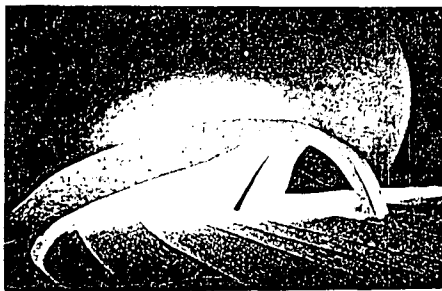
3.0 DAYLIGHT ON BUILT SPACE: MANIPULATION OF BARRIER.

As earlier explained light is mostly a quantitative element with its illumination levels, brightness levels, etc. but when it manipulate in to such a built space and after it strikes on elements in space its qualitative attributes emphasized. Then it acts as an enhancer of spatial quality. These qualities in space are arisen with the composition of built space. This composition comprises several aspects like proportion, texture, scale, volumes, etc. However there are such qualities in daylight itself, which are used to emphasize this composition. Shadow, light and dark could be considered as main qualitative attributes in daylight. When daylight manipulates in to a built space those qualities should be considered. This chapter is to satisfy that aspect, which is to study of so called qualitative attributes and how daylight manipulate to inside considering those qualities.

3.1 QUALITATIVE ATTRIBUTES OF LIGHT

3.1.1 SHADOW

Shadow is lights counterpart. It is the gradation between lit surfaces and surfaces in shadow which supplies information about the three – dimensional form of a body. When the contrast is strong due to light coming from only one direction, information about the object is reduced. If the contrast is reduced or even balanced by lighting from several sources, the three- dimensionality is increased. If the light is uniform, coming from all sides, the object becomes flatter.



(Figure 29:shadow enhances the Three - dimensionality)

Shadow like light used consciously as a line, can be used to delineate, even to emphasize the forms and edges of bodies and space. The shadow cast by the outline of a cornice emphasizes the upper termination of a façade. Window frames produce an elegant line when positioned flush with the façade whereas the shadow line from a deep recess emphasizes the apparent weight and thickness of the structure. The recessed joint between a timber frame and the wall defines the articulation.

Darkness tends to obscure the enclosure and rather than counteract this effect, the Japanese builders at old seem to have deliberately enhanced the consuming power of shade.

“ The qualities that we call beauty, must always grow from the realities of life, and our ancestors, forced to live in dark rooms, presently came to discover beauty in shadows, ultimately to guide shadows towards beauty's ends and so it has come to be that the Japanese room depends on a variation of shadows, heavy shadows, against light shadows - it has nothing else.”

(Tanizaki Junichiro 1991,Pg. 18) ¹⁸

Shadow created humane spaces; recesses are made deepest where daylight cannot penetrate. Dark woodwork in Japanese architecture absorbs excess light. Spaces are folded into ever-dim layers.



(figure 30: Play of shadow in an arcade)

Dim shadows are inhabited by colossal and primordial columns of raw concrete that in the way of archaic architecture symbolically support the world and communicate with the heavens. Dark space creates frightening and irrational experiences that profound nothingness which makes man sense his smallness before the mysteries of divine power. Pre historic times this humbling power of darkness created by shadows was deftly used by builders to arouse religious emotions.

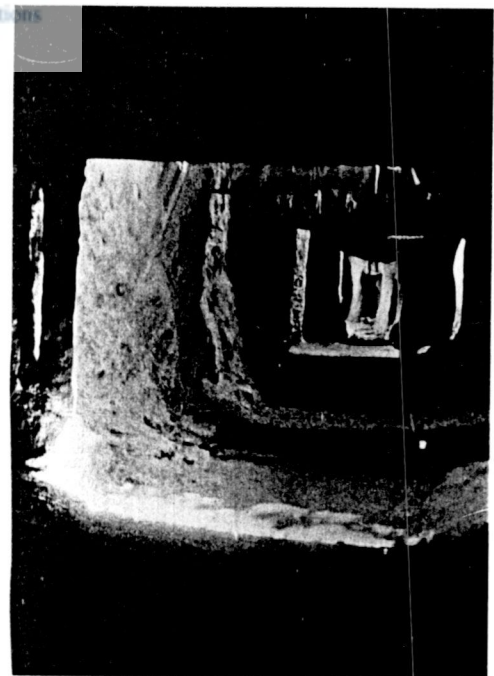
The chill and awe of shadows could lead to a feeling of the sublime and through it a sense of the "numinous". But for feeling of real sublimity, "the darkness must be such as is enhanced and made all the more perceptible by contrast with some last vestige of brightness, which is, as it were, on the point of extinguishing hence the mystical effect with semi-darkness. Deep shadows could detach us from our previous connections to space, sometimes almost blinding us, and giving a shock to reality.

Shadow with light effects to the 'light and dark' quality of a space. Darkness is something arises where light is not appeared. But when light disturbed by an object and when it makes shadows, it also creates light and dark effects.

3.1.2 LIGHT AND DARK

Things are less bright than the sun and the sky, but not different in principle. They are weaker luminaries. Light reflects by objects showing their geometry. Light is the source to enhance objects.

Perception of a space remains relating constant each of the level of illumination increases objectively tenfold or more. This is true beyond the capabilities of ocular adaptation. Within contain limits if a constant effect is maintained the space will be lighter or darker, but not fundamentally different. When man moves from one room to another the settings, which follow each other can present a different atmosphere in terms of their lighting more or less contrasting, perception of them is relative. To move from full sunlight in to the semidarkness of a Romanesque church induce a kind of shock, which emphasizes the opposition between sacred and profane.



(Figure 31: Light and dark quality in a passage)

From time to time immaterial darkness has also provided the crucial experience of negation, which blots out what has been in order in life, which can be made new. Where light fades away, the world goes with it, setting the stage for energy and this life, to be reborn. The kind of shadowing initiation and passage from darkness into light appears in one form or another in most religious beliefs, and the spatial choreography of most religious architecture.



The dim interior and by extension every interior at traditional space provides a place where the light is turned down so the soul is confined to rest. Complementing the soothing effects of chilly gray tones, the dark solitude offers another sort of optical asylum from sensory and mental impacts. Floating in a blacked out eternity the beholder unwinds and relaxes.

(Figure 32: Darkness to light – Resting soul)

But in contrast with a gray with drawl the blackness brings an oceanic and in many ways entryonic oneness with the universe, slowly healing the split and bruised connections between inner and outer worlds. And something begins to glow inside man when the outer lights are extinguished. The more secret light of an inner world begins to murmur and rise to the surface. Acting as an incubation space is shut an away from the sensory light outside, which tends to draw people out of themselves. Manipulation of daylight is in other words the manipulation of shadow, and manipulation of "light and dark" because the final product is a combination of such qualities.

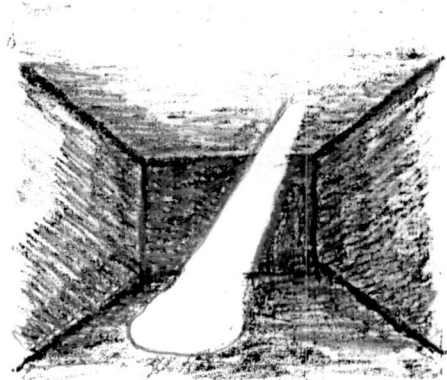
3.2 DIRECT WAY OF MANIPULATION

Architects manipulate light in to inside in different ways. In some cases Light strikes directly on space. But in other instances light is indirectly coming to the interior. When there are obstructions in space and in the barrier, the path of light is disturbed. Then light starts to reflect or filtered. Architects can use this natural rhythm meaning fully and effectively with the elements in space. Daylight when it comes to inside directly even there will be limitations and an architect should control them in a manner to enhance the spatial quality. Then only the space becomes emotive. This way of manipulation is further studied in this chapter.

3.2.1 LIGHT SPACE

Daylight always lit up the outside. When light portions fall on space it creates light space in built environment. Light space is an imaginary space, which is created when a portion of space is well lit while the rest is left in semi or total darkness. The limits are imaginary in light space but perfectly perceptible.

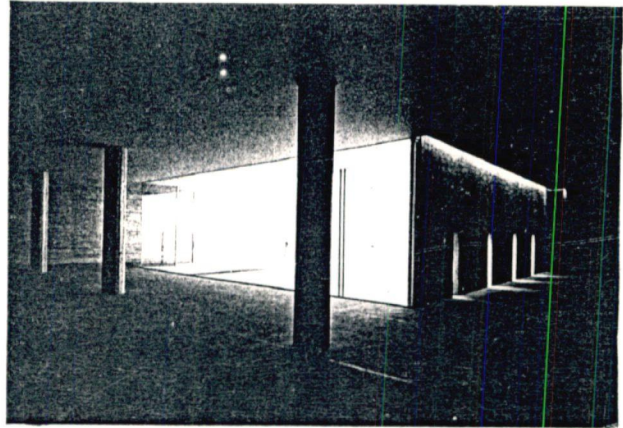
When an observer is outside, he sees as “ a transparent box within a large box.” Illuminated portion attracts his mind. If he is within the small illuminated box, the space in the semi darkness appears of interminate size to the point of ceasing to exist.



(Figure 33: sketch-light space)

Light space makes it possible to present scenes as in a theatre. Space performs its qualities with light space. Man moves on space from light space to darker space and vice versa according to his mind status.

This situation is a direct manipulation of daylight, which penetrates, coincide without a break. When the difference of dark and light is more that space becomes strong. But when that difference is loose the quality, which makes exiting environment, becomes dilute.



(Figure 34: light space – Transparent box)

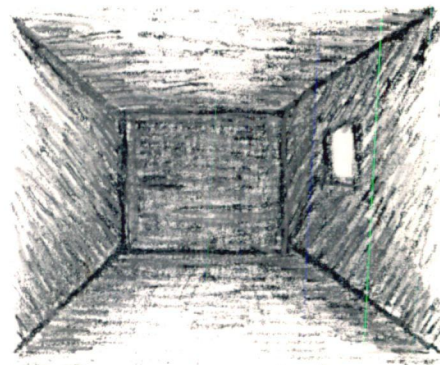


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When this difference is stronger the light space becomes an element in the space. This stronger situation expresses high points in architectural space. Observer becomes less important and space, which is illuminated, becomes contrasting. Then the object within that space is highly contrasting. The observer is attracted towards the focusing of the concentrated light.

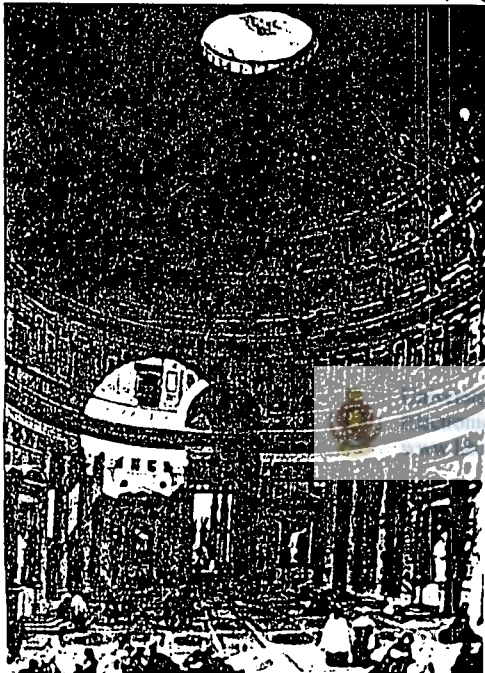
3.2.2 LIGHT AS AN OBJECT

When direct light penetrates through an opening/a hole this object is created. This happens according to the pattern of the barrier. When the opening is surrounded by solid mass, light object is contrasting. Where the space is darker, light object dominates.



(Figure35: sketch- light as an object)

Light as an object, the single window, the isolated stained glass window, an object or a person spot lit in a dark space, a candle in a room, establish relationship of dependence between source and space similar to that of figure and ground. When looked at directly, the source fascinates and dazzles at the same time, on condition, however, that the size of this source is relatively small in relation to the spatial envelop. When one turns one's back on the source, spatial perception is completely altered, because the walls, the floor, and the ceiling in turn become a weak light source whose surface is immense and enveloping.



(Figure36: light as an object, Pantheon .)

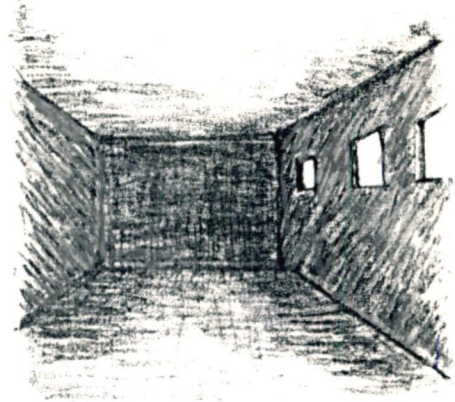
In terms of design, it can happen that an architect tries to work with a unique concentrated source for practical or symbolic reasons, at the same time wishing, for one reason or another, to avoid this alternation of glare and uniform lighting. In this case the source must be placed well above eye level (e.g. Pantheon) or even concealed (indirect side lighting). It is not by chance that glare is use for intimidation and torture.

Effects of the light object changes due to the changing pattern of daylight. It makes different moods from time to time. Plane where the object is placed matters to the quality of space. Orientation of plane is the most important thing in that sense. Also the shape of the opening where light penetrates will contribute a different pattern to spatial arrangement.

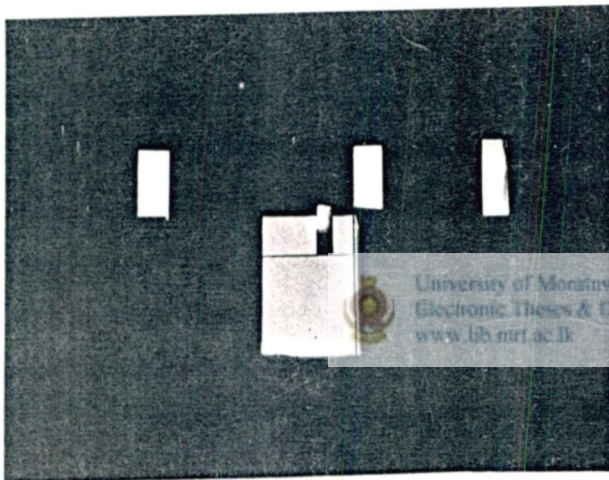
3.2.3 LIGHT FROM SERIES OF OBJECTS

When there is a collection of objects which light comes inside is considered as series of objects. Series of windows, openings, holes tend to establish balance and a possibility of inversion between the figure character of luminous objects and the background character or the spatial envelop which they illuminate.

A regular series of window or wall openings, or even sky openings make an active contribution to the delineation of spatial limits. A larger or smaller window on the axis, or a series of sky lights on the centerline of the room, help to clarify the spatial geometry. A freer arrangement of the light source requires understanding of the principles of balance.



(Figure 37: sketch- light from series of objects)



(Figure 38: light from series of object)

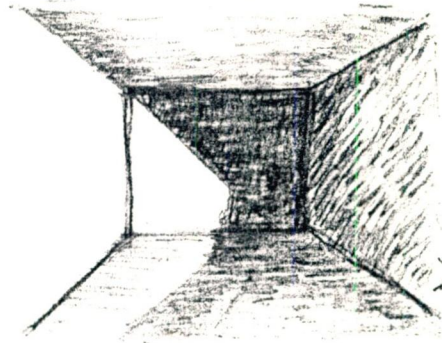
Individuality of each object depends on where it is placed and the gaps between the objects. Also quality varies due to the orientation of objects that may create one object well illuminated and other one dimly lit.

Even object of light can be performed individually or as one. Some times they are overlapping. It is an interesting situation where all together create dynamic spatial quality. Different patterns of objects can control to have well-organized space or mad spatial quality by their arrangements.

3.2.4 LIGHT FROM SURFACE

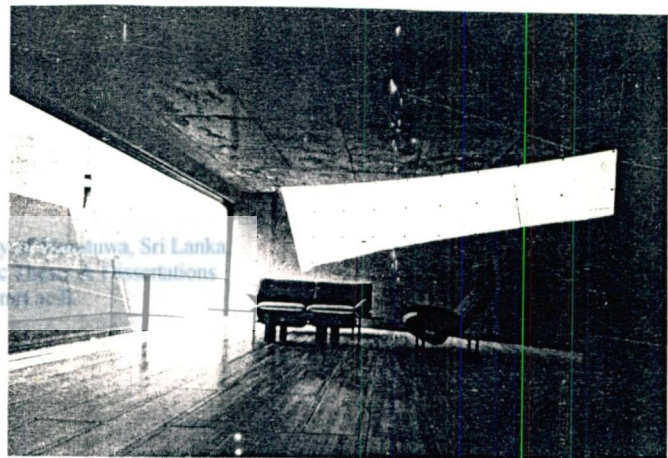
In this situation walls, ceiling, and floor lit by invisible slots. Spatial boundaries/ limits/barriers become a light source with a noticeable gradation from light to darkness. Some time's daylight penetrates through whole of the surface, which feels that there is no barrier in-between inside, and outside.

Fully gazed outer layers of a space create this situation which barrier becomes diluted by strong direct light. People feel not in inside but living in continuous outside with lateral penetration. When ceiling becomes transparent the upper barrier is the sky. Vertical penetration makes high impact in human mind. People feel that they are in outside with open sky.



(Figure 39: sketch – light from surface)

In this case sometimes the surface will be without any element. Completely opens to outside. Some times only a few columns. When the openness changes the quality of light also changes.



(Figure 40: light from surface, Credit: Tadao Ando)

3.3 REFLECTED LIGHT

Daylight, which is reflected by natural elements, creates natural impact on space. Natural elements like boulders, grass surroundings, sand surroundings, tree leaves create different qualities to space. Some natural elements reflect light strongly and some absorbs light and then the reflectivity is less. Those different characters of natural elements contribute their capacities to make variety to architectural space. In some instances these natural elements are moving or vibrating. All that dynamic spatial qualities are inhabited in architecture. Even according to the textures and patterns of those elements quality and intensity of reflected light differs. Moving light patches add dynamic living quality to space. Different depths of surfaces where reflection occurs and orientation also create variety to space.

Light reflects through water to built surfaces creating rhythms in it. The Shimmering character of water automatically inherent when light reflects through it. A person who is in such a space feels that quality and it breaks the monotony in the space. When wind is there, water makes waves; light reflected from that water surface also makes wavy patterns to space. Water may be inside or outside, when its inside light comes from barrier by the ways, which were described earlier and reflected through water. If water surface is in outside direct daylight /sunlight can be reflected through it to interior.

The impact created by water reflected light is different according to the place, where water is, its relation to sun path, size of water collector and orientation of building. Water has good healing quality and that makes observers wellbeing. From traditional architecture use of water was a considerable source in making architecture.

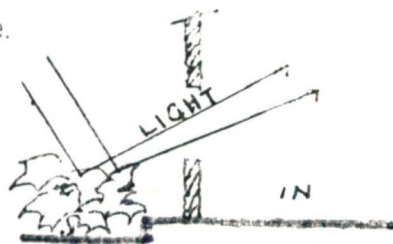
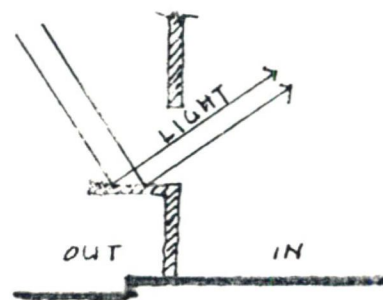
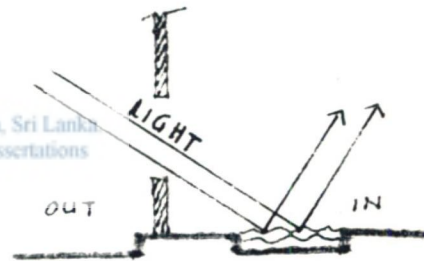
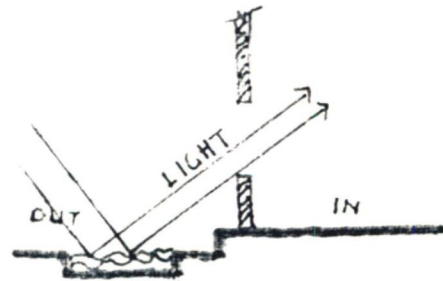
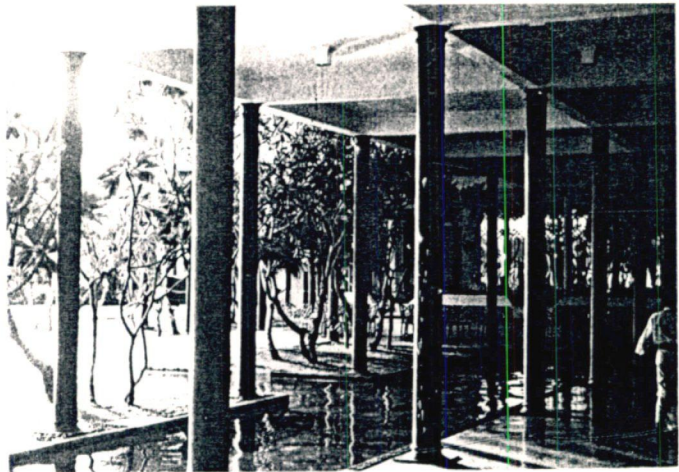


Figure 41: Sketch – Light reflects in different ways)

Light can be reflected by built surfaces where nearby such space makes inside lit. This may be by built surfaces of another adjoining buildings or the same building. Also interior walls partitions and other elements reflect light.

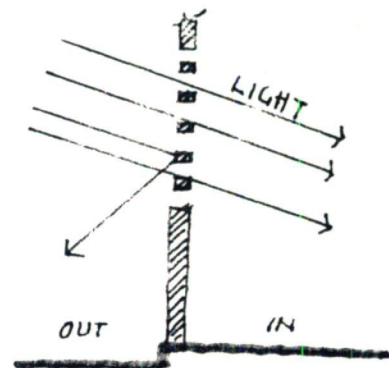


(Figure 42: Reflections in water, Hotel Triton, Archt, Geoffrey Bawa)

Architects do this consciously by having projected elements, overhanging and by other elements to make light patterns inside. According to the site, location and quality of built surface, reflected light quality changes. Shining surfaces will reflect sharply and some surfaces absorb light and they create dull qualities to space.

3.4 FILTERED LIGHT

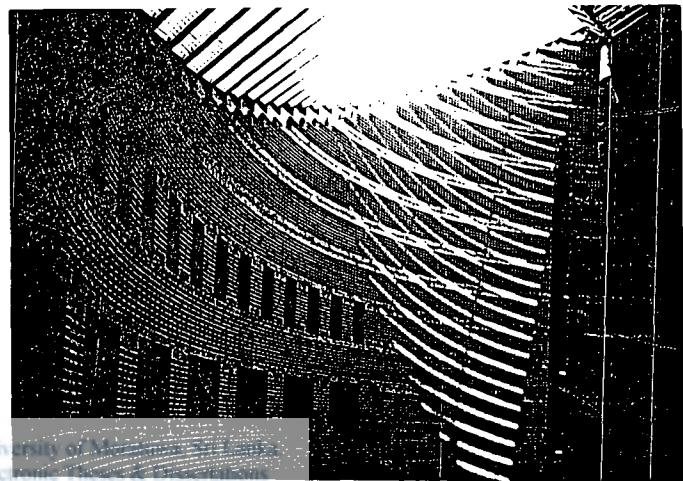
Filtered light creates interesting light and dark qualities to space. Tree canopies are marvelous natural elements to that sense. It creates shadow and light portions when light filtering through leaves. When leaves move, shadow also began to move. It's dynamic and sensitive. When daylight becomes dull the sharpness of shadow is also reduced. With that quality created by filtering through also changes.



(Figure 43: sketch filtering of light through netty structures)

Built surfaces become picturesque due to filtered light by this. Larger the leaves make larger the shadows and tiny leaves make tiny shadows. Effects to space with those variations are varying. Season to season quality of the shadow makes different moods. When it becomes the dry season and leafless this creates another completely different images. Light coming from a fully opened window and from a window, which covered, by a tree is completely different.

Architects consciously design elements to light penetrate through them. These elements filter light to have different patterns. It may be a Matt, egg rate, steel framework or anything but the main purpose is to have light and shadow effects created by filtered light.



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(Figure 44: Filtered light)

In some cases these elements use as shading devices to protect from direct sunlight. People imitate nature from past. These elements are also a kind of imitative expression of nature. The patterns created by these elements vary due to quality of daylight as well as the quality of that element. Especially if openings are moulded sharply the shadow also becomes sharp. When strong daylight filtered through tiny openings the edges of the frames of that element are lit in sharp nature. It create silhouetted frames which attract mans mind and concentration.

3.5 CONCLUDING REMARKS:

With consideration of all the ways which light is manipulated it's clear that different methods in manipulating light creates different qualities to space. These different patterns are the elements, which enhance the emotional content in architecture. Shadow and darkness are the counterparts of light. Quality creates by light is a result of those two elements of shadow and dark. It is an important to consider about those two elements in light when play with light in architecture.



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CHAPTER FOUR

The correlation: Spatial quality and human emotions through manipulation of daylight

CHAPTER FOUR

4.0 THE CORRELATION: SPATIAL QUALITY AND EMOTIONS THROUGH MANIPULATION OF DAYLIGHT.

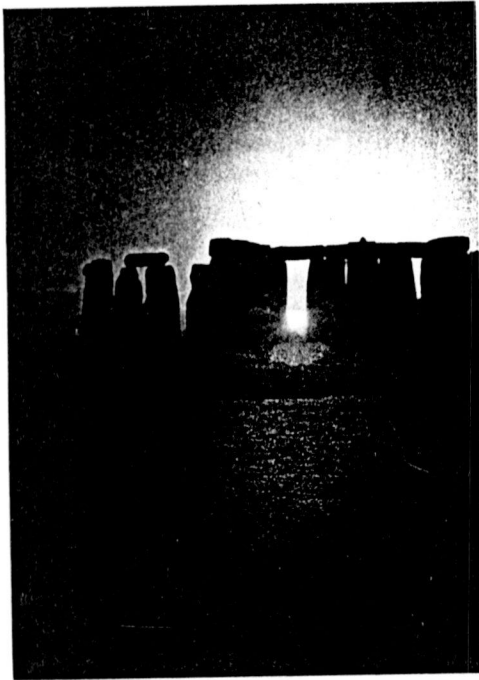
Quality in a space differs according to the way of manipulation of light and the relation of inside to outside. Feeling which occurs due to such qualities also vary with the changing pattern of this relation. It is expected that feeling and its relation to space again changes with the three events of inside and outside relationship. This chapter will discuss that aspect thoroughly using examples, which were successfully, achieved at this task.

4.1 CONCEPTION ONE: ELEMENTS IN SPACE.

Conception one mainly dealt with the elements on space. Here main consideration goes to pyramids because they are well-moulded elements which solid massing quality is well represented. Light plays mainly in two different ways in this incident. Pyramids and other masses are dominant in vast spaces due to reflected light. Their main articulation is, reflected light and surface relationship. Secondly this conception is dealt with quality of shadow. Shadow enhances the solidity as well as the three dimensionality of space. These two events are discussed here aiming to have an understanding on feeling which rise with relationship of light and spatial quality.

4.1.1 REFLECTED LIGHT: ENHANCING MASS ON SPACE (CONTEXTUAL RELATION)

Conception one is about masses on the space. This is about how reflected light makes fusion of mass and space. In most of these cases, masses are sculptural forms. These sculptural forms are powerful abstractions on three – dimensional spaces. They are combinations of planes at a distance of a natural focus. Man feels that the piece of mass as the center of three- dimensional space, which dominates a surrounding space. How does it happen? Light rays meet the plane and reflect. Edges at plane illuminate. The Egyptian pyramids are “artificial monuments” which were built to make the properties of a real mountain manifest, such as an inferred vertical axis, which connects earth and sky and “receives” the sun. According to the shape of the element the role of reflected light differs.

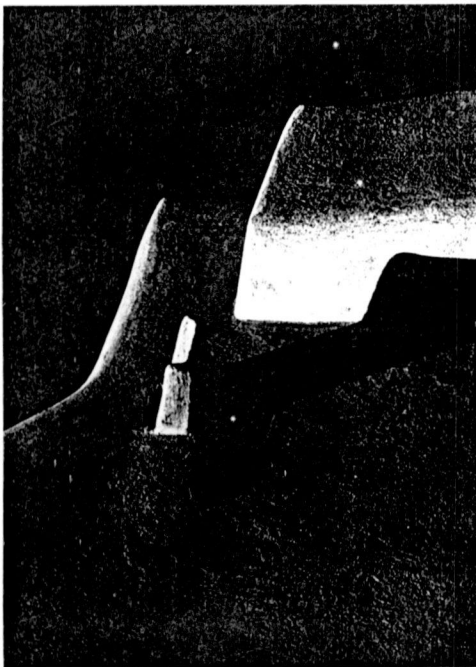


Pyramid is mere a picture than a structure. The pyramids stand on the rim of the dessert. Below them stretches the fertile valley, behind them a limitless waste of sand. Life and death, an exuberant fertility and all eternally sterile land, come together without compromise. In one respect the pyramids are unique. No later period has ever attempted to make use of so subtle a simplicity to express its irrepressible urge to link human fate with eternity. It is this absolute simplicity and perfect precision that transforms the logic of numbers in to enigma and mystery. Massive solid structures of pyramids enhance those qualities by light, which is reflected from



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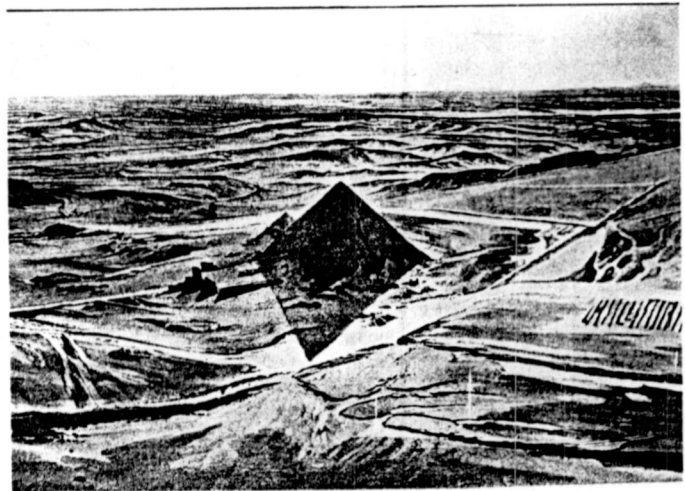
(Figure 45:Light enhances Monumentality of sculptural forms)



The enormous highly polished triangular planes repel any disturbance of the dead. The pyramids were undisturbable symbols, seat of the god kings. Their huge, immaculate surfaces /planes formed a mirror for the ceaselessly changing atmosphere. They displayed what eye only particularly perceives. They reflected all that posses between earth and sky and all the infinite delicate changes of the moving hours. They gather light even today, though their surfaces are now rough and granular.

(Figure 46: Light reflects from mass)

The play of ever –changing light imbues them with eternal motion. Their colour and form passes through every phase- almost complete dematerialization in the midday glare, enormous weightiness in the evening shadow, a black triangular plane soaring vertically upward.



(Figure 47: Reflected light and solid mass enhancing the quality of fertile valley)

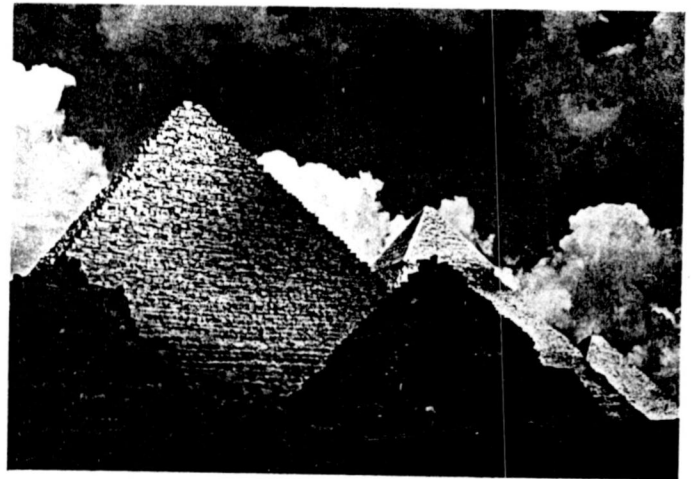
Vertical lines and forms express an active relationship to the sky and a wish for receiving light. Verticalism and religious aspirations have in fact always gone together. Verticalism is obtained by how these massive structures are built. It encourages light to reflect with the shape of them. Play of reflected light and plane itself emphasize the vertical quality, which represent the religious symbol.

4.1.2 CONTRIBUTION OF SHADOW FOR DIVISION OF SPACE AND MASS

Natural plane has two basic elements- earth and sky. Everywhere some kind of interaction between the two elements exists. There are places where sky and earth seem to have realized a particularly happy “marriage” by vertical elements like pyramids, and stupas. The ground is simultaneously continuous and varied, and the sky is high and embracing without however possessing the absolute quality encountered in the desert architecture where the material symbolized the solidity and permanence found in mountains and rocks. At the same time the pyramids through their location between oasis and dessert (life and death) visualize the spatial structure of the desert, a longitudinal fertile valley between infinite expanses of barren land.



The infinite extension of the monotonous barren ground, the immense, embracing vaults of the cloudless sky, the burning sun the dry warm air, which makes the solid structure much dominance. This dominance is a result of the dessert. Dessert is that much powerful in religious sense.



(Figure 48: shadow on pyramid:
enhancing three dimensionality)

Arabic proverb says,

“ The further you go into the desert the closer you come to god”



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In the oasis the slender trees of the palms which rise from the flat expanse of the ground seem to make the order of horizontals and verticals with this abstract order no truly plastic objects are possible. The ‘ play of light and shadow’ is extinguished and every thing is reduced to surface and line. This play of light and shadow provides such powerful effects to division of mass and space.

It furnished a point of an untiring imagination that transposed reality to a mythical religious sphere. The daily journey of the sun becomes an ever-renewed battle between light and darkness, between the forces of good and of evil, which were continuously undergoing anthropomorphic transformations. This transformation is not only for pyramids or stupas, most of structural forms with prominence solidity emphasize this quality.



The side caught by the light is illuminated, while a dark line of shadow emphasizes the other side. The effect of those sharp edges is so intense that outlines are fully visible under the most glaring sunlight.

(Figure 49: Stupa - different massing principle with light)

The outline of a mass are brought to life on the sunlit side and stressed by a deep black line on the shadow side. Lines are illuminated with bright lines and recesses are dark with the shadows of projected elements. Solidity and surface is highlighted enormously with this light and dark contribution, which created three dimensionality and contextual relationship well.

4.2 CONCEPTION TWO:

INTERIOR AND EXTERIOR ARE TWO UNRELATED CONSEQUENT EVENTS

Conception two is about interior and exterior, which are not, related to each other. But specialty here is that light is taken from outside. Even when light is taken from outside people are not feel about outside. Here light becomes completely an interior experience. In this event inside and outside environments can be completely different and independent, but quality of light according to the sky conditions will make an impact to change the both environments simultaneously but outside doesn't make a considerable effect to the inside.

4.2.1 LIGHT SPACE- SPACE WITHIN SPACE

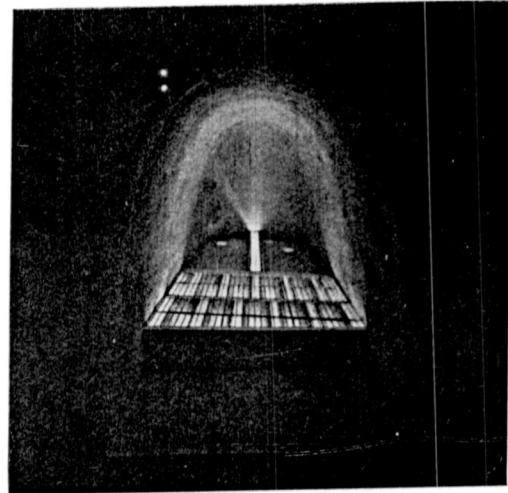
Light space is where a portion of space is well lit, and the rest is left in semi darkness. In this situation the surrounding darker area wraps the lit area. Two spatial interactions are clearly visible. Observer's mind varies according to where he is. It enables the person who is in a lit space to isolate him and concentrate better. Light doesn't make any relation with outside to observer. Observer is isolated from the outside. Always light source is placed at a strategic point of the space. It becomes dominating to where observer's attention attracts. It avoids clear views of outside.



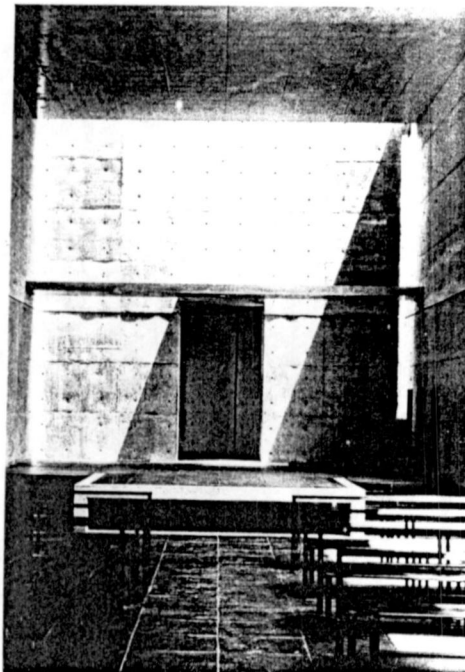
(Figure 50: Light space: as main attraction)

In religious places this is the way attraction is created. Divine light from skylight in large volumes makes a dominant space where observer concentrates his mind. Ancient man concentrated his attention on the sun as a "thing" rather than more general concept of "light". Contrasted light space becomes a "thing" in space.

Man moves towards the altar because of light. His mind converts with meditative feelings. Body becomes a secondary object, and mind dominates. He controls himself with the meditative calm quality of space. The whole surrounding and darker space stresses the person and forces him forward. God becomes the spirit of life. This concentration is the abstract quality of space in religious places. This effectively happen when light comes from up as god is in heaven.

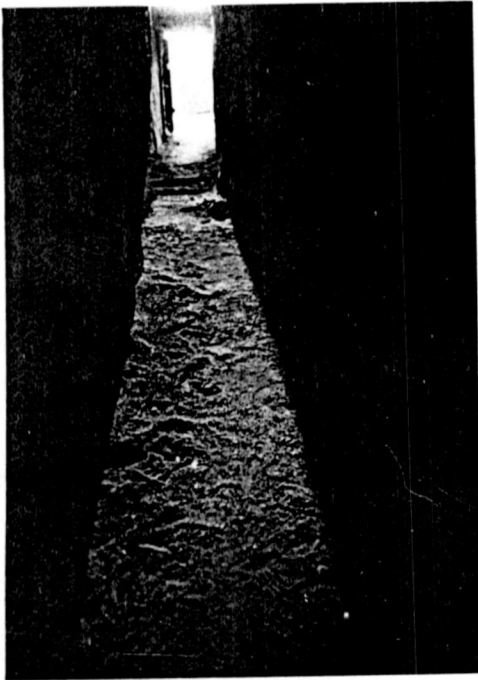


(Figure 51: Light space in darker tunnel at Ronch chapel and light space in a Buddhist temple.)



(Figure 52: Light from up - interpretation of heaven)

Generally light space is used to highlight such a space. Spatial progression also accommodates with light quality. Concentrated light from space to space with brakes of darker area leads a person towards the climax of a built environment. Changing the mind and the status of man does all those.

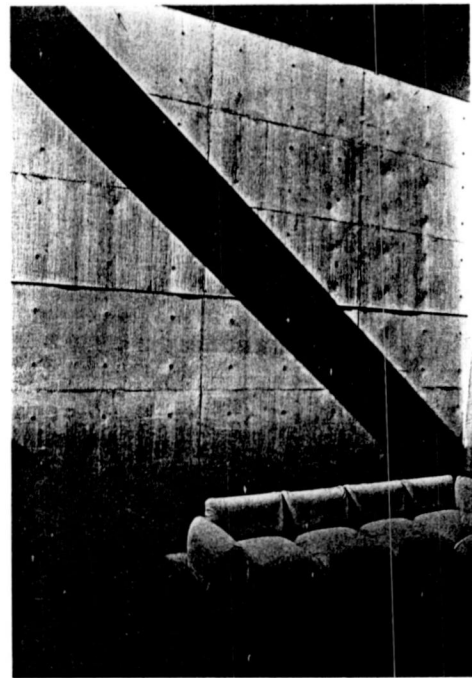


(Figure 53: Light space for spatial progression)



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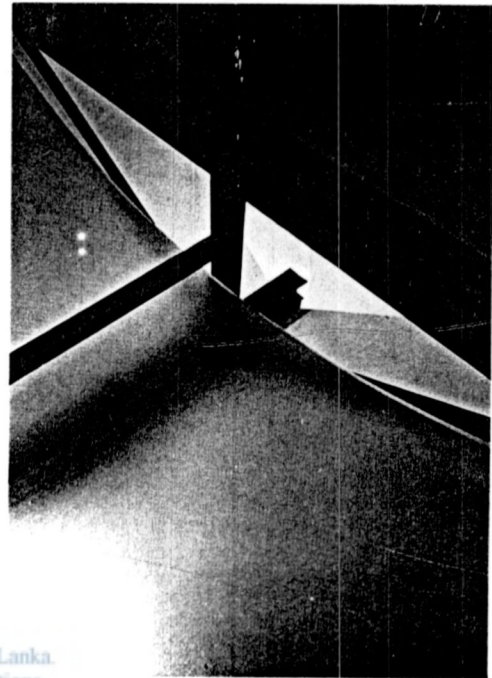
Light space directly affects to the human mind, and physically separates inside and outside. Conceptually separated two domains of inside and outside create darker interiors. Light space is a result of this and it is again improves separation while having openings on barriers without connecting man to outside. Light falls to the interior by an opening and it is spreaded and flows to the interior but the difference is that this is not an object on the space.



(Figure 54: Light space - Making intimacy)

4.2.2 LIGHT AS AN OBJECT: ELEMENT OF ATTRACTION

When light penetrates through a single opening on wall / boundary where establish a correlation of space as a single entity, is the light as an object. Light coming from such an object is unique and concentrated. It's symbolic, elemental. Though light coming from outside is a fully interior experience the whole interior attention may focus on the light object. But previously discussed incident (light space) is a different experience. It's a kind of separation - lighted space within a darker space. But here the whole space acts as a unique entity and light object as a symbolic representation.



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(Figure 55: object on barrier)

The cutouts on barrier are the life to inside space. These openings transmit light through space while strengthening the character of the barrier. The spatial character, which determines by this light manipulation, can be directly related to the feeling.

In Christianity light became an 'element' of prime importance, a symbol of conjunction of unity, which was connected, with concept of love. God was considered pater luminis (father hood) and divine light – manifestation of the spirit. This romantic stage of Christian architecture was embodied in the gothic cathedral. The idea expressed in this building was the soul, the absolute spirit, and the inner chamber of god. For the first time in aesthetic theory the space within, enclosed by architecture as the necessary content. Space within made visible by concrete form, became the embodiment of spirit.

In general openings serve to concretize the difference in inside – outside relationships. These objects, holes on massive walls give emphasis to enclosure and interior. In the works of Tadao Ando its clear that light is pouring through opened cracks, flowing over an around and through the slits left between the intersecting planes. The liquid quality of those light objects makes one's mind calm, meditative. Sunlight at different times of day has different qualities, which breathe, into human states of being throughout each day. Quantitatively west light may be the same as east. In quality they are distinctively different. Mood created by each time also is different.



In Church of light, this symbolic unique concentrated light is used for the cross behind the altar. That light source and the entry of light determine the center of the space and it gives depth to space. Depth to the heaven - opening, continuity to "God". Mind moves faster than body, where man reaches to alter mind already converted for worshipping. Concentrated mind bonds with the spirit of god.

(Figure 56: church in light –
Light object to concentration of mind)

Heavy closed buildings betray a certain spirit of gloom and brooding. Light comes to these spaces by a single opening. It gives higher power – symbolize – to space. It awakes the depth of mind. When volume is large the quality deeply affects the mind. The Pantheon in Rome with an entirely enclosed interior with a large volume creates such quality. Man feels it well in Rotunda due to mild light above him three times as high as the ceiling of the peristyle. The dome does not seem to limit the space but rather to expand and raise it. Light is diffused because it comes from such a great height. But it all falls in the same direction, coming from a single source and producing real shadow. An observer feels that he is comparatively smaller and his mind becomes isolated from the outer world. Longing minds within a huge volume make such a person to pray with his inner soul and not by his physical relations.

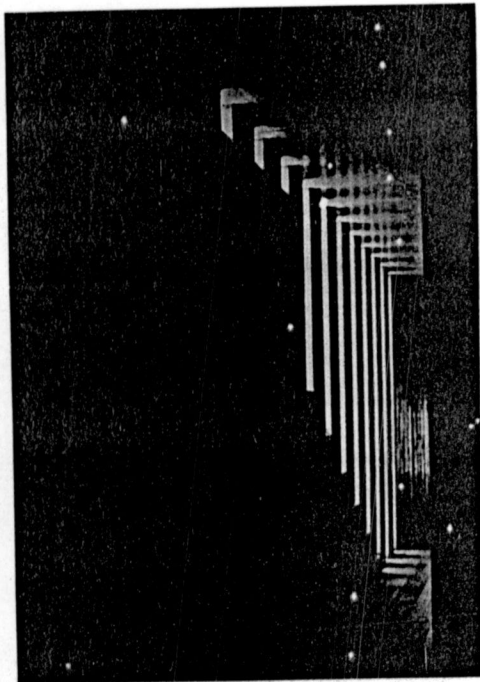


(Figure 57: Pantheon Rome: Light from heaven)

In the Buddhist temples this situation vary due to focusing of a light object. In most cave temples the single 'hole' of the cave used to take light inside and it projects to the statue of Buddha. With that the inside of the cave is gloomy, and only the statue is illuminated. The observer is attracted towards the statue to worship but gloominess inside make his mind concentrates in his moving pattern. With the darkness of inside the observer concentrates on his body movement and his whole mind focuses on his foot. Mind is directed with the body movement. With this approach man prepares to worship with a controlled mind but in the Christian churches the whole mind connects with god. So an observer in the church moves towards the altar with attraction to upper volume – representation of god and the body is forgotten.

4.2.3 LIGHT FROM SERIES OF OBJECTS- SERIES OF PUNCTURES

Light receiving from series of objects – the concept is same as light from an object but the emotions are different. This articulation of barrier with series of objects may be symmetrical or isometrical balance. These series of objects make continuity and variety to space. Space reveals by the play of light and shade. Surface is lit in several points and the other area is comparatively dark.

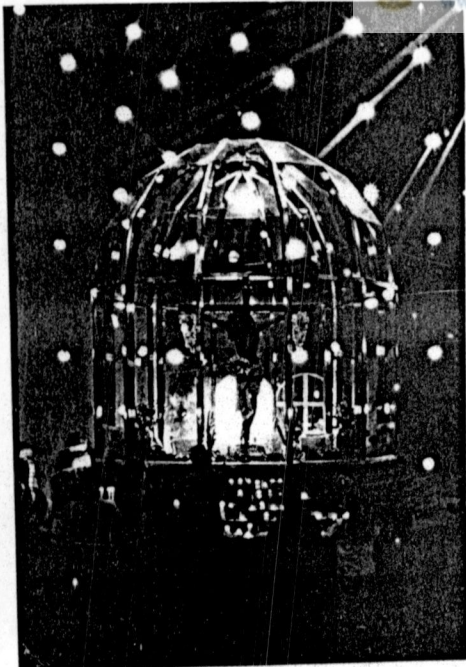


(Figure 58: Light from Series of objects)

Light from many directions at once unlike the forceful shadow etched out by sun, these overlaid washes are thin and blurred. When recesses are made deepest daylight cannot penetrate. Space is folded in to ever-dim layers from several objects. Materials and light are two completely opposite poles, which belong together. Thick walls with sunbeams through deep recesses- dark rocks in luminosity make an emotional surrounding. This light against darkness gives joy to the heart.



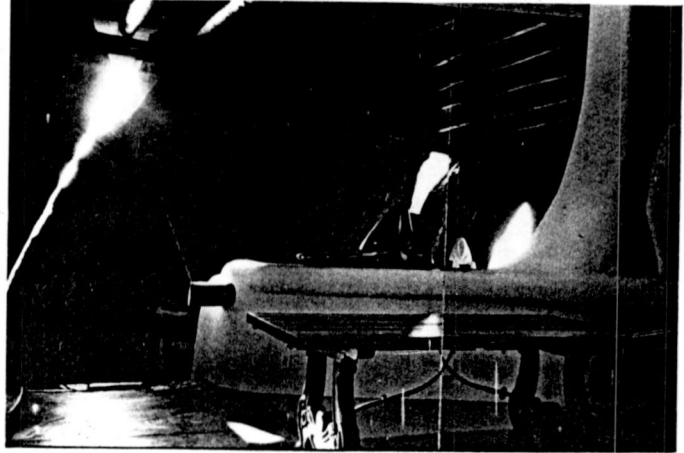
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(Figure 59: Overlapping light from objects)

The light is more full of health giving and aesthetically satisfaction to life. Where a window can be deep set into the wall, the light reflected off the reveals adds to room illumination, but intercede between brightness of light and darkness, and can add to the mood of calm silence. It's a collaboration of the subtle tones of sky light by mind. Here light is used to emphasize the variety of space- variety to feeling.

Also daylight into a room lit by several objects, creating an interplay of light hues and shadows from different directions. Particularly daylight with its many moods and colours from different directions endlessly change throughout the day. That's why light from two holes in two walls from two sky colours is always more pleasant and healthy to the mind of man.



(Figure 60: Variety of objects to variety of space)



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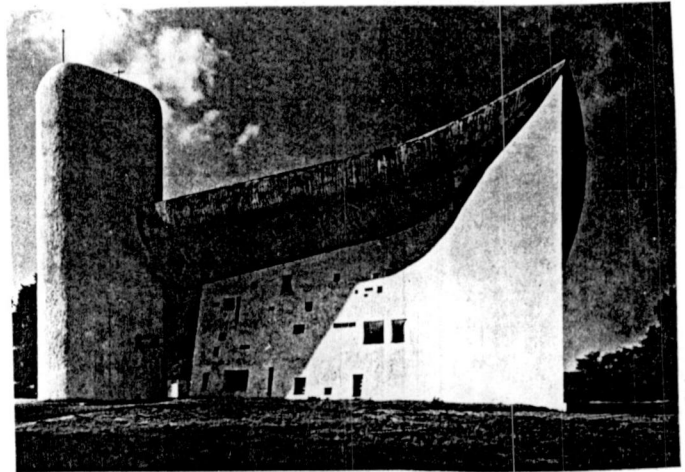


(Figure 61: Ronchamp chapel – marvelous experience in light from series of objects)

Ronchamp chapel by architect Le Corbusier is a masterpiece in architecture which emotive use of light is clearly visible. The dark cut outs gained life in the interior. They transmit light through a short tunnel, which beyond diffused streams of light. They blur the strength of the surface (barrier), which was present in the outside. Therefore the furniture etc. becoming silhouetted in this room.



In Ronchamp thick walls are pierced by many openings of unequal sizes. From the outside they resemble tiny peepholes but inside they open up into large, white embrasures which cast a great deal of reflected light into the dim lit room. The worshipper concentrates mind on his devotions.



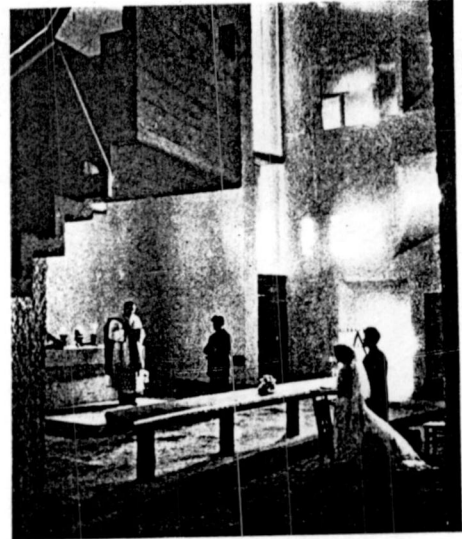
(Figure 62: Ronchamp from outside - only objects without penetration for people)



(Figure 63: Silhouetted figures- Religious feeling with light objects)

Shadowed dimness light creates vaguely revealed masses with silhouetted quality furniture, which catches the worshipper attention towards the altar. Calm and emotional interior encourages worshipper for religious concentration of his mind takes him away from outer world. Light softly invades to interiors by opening of walls, echoing and confirming the invisible moods, people feel inside of their soul, visualizing inner need of a person. This is how ancient tombs were designed with tunnels and all that, which man identifies death and closer to that feeling.

Lecorbusier became increasingly interested in representing the spiritual motivations, which lie at the root of all human experience. He looked to natural forms capable of divine and mystical character. His church at La Tourette, with its chapels consisting of immensely powerful light 'scoops' and light 'tubes' and made simply of concrete, colour and light transformed a place of worship to a 'other- worldly' environment. He has formed these light objects effectively to make meaningful spaces.



(Figure 64: Variety of experience in Ronchamp chapel)



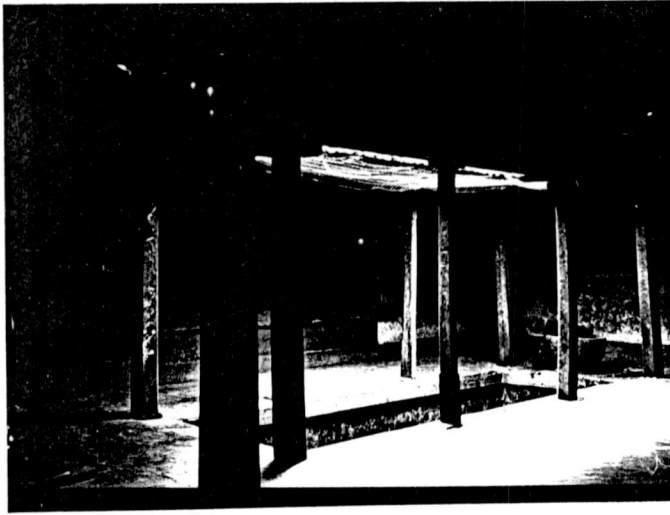
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4.3 CONCEPTION THREE: EXTERIOR AND INTERIOR ARE RELATED INTERDEPENDENT EVENTS

4.3.1 LIGHT SPACE- CONTINUITY WITH OUTSIDE

In this case space-defining element becomes more penetrable just like a verandah, an arcade or façade with full-scale openings etc. This makes path to light to penetrate to interior. Inside and outside are bound to each other – light is the bonding element.

Light space is where light comes inside as a collective patch or a portion. Lit space is contrasting with darker surrounding. Interplay of this light and dark qualities make space emotional. Sometimes it feels as outside peeps to inside or other way it feels inside is taken to outside.



(Figure 65:Light space in a darker surrounding)



(Figure 66: Limited Penetration by Overhanging roof)

Huge overhanging roofs are developed to shelter the interior from rain and sun allowed only by the softest and dimmest light to reach the outer verandah. Where a half – lit- zones wrapped around the building edge cast deep inside was an array of transparent shadow with pooled effects.

A dim lit space surrounded by gloomy / dark surrounding in an evening sun, makes a man in that space feel mystical images. Calmness and serene of the environment makes mind free and calm.

Light space is a simple light phenomena- glowing patch of light, where some times framed with powerful effect by a picture window, or other carefully shaped openings on architect Geoffrey bawa's buildings aimed to snatch a beautiful radiant scene from out of the darkness, and hold up to view – the connection to outside. Mind flows out rather than waiting inside. This floating effect of mind is the better background for poetical feelings.



(Figure 67: Light space created by a window : Evening experience)

In that situation the person is isolated from the outside. But here man has a direct relationship to outside. He feels he is not in an enclosed room. Light space here is some times a lighted portion with an irregular shape. It makes natural effect to space.

4.3.2 LIGHT FROM SURFACE: TRANSPARENCY IN BARRIER

The character of man-made place is to a high extent determined by its degree of "openness". The solidity or transparency of the boundaries make the space appear isolated or as part of a more comprehensive totality. It's the inside –outside relationship, which constitutes the very essence of architecture.

" Architecture occurs at the meeting of interior and exterior forces of use and places "

(Ventury Robert, 1966,Pg. 88) ¹⁹

Direct light is controlled in this situation unless it creates harmful strong light spaces out beyond a space, which the rays of the sun can at best barely reach. An architect extends the eaves or build on a verandah, putting the sunlight at still greater a remove. The light from the garden steals in dimly through doors and it's precisely this light space that makes people feel the charm of a space.

When light space is wrapped in darkness that makes space within space. A lit box inside a darker volume. But lit volume flows to outside it creates continuity, man inside the light space may not has the same feeling as in light space described in conception two.

Evidently this meeting is expressed in the wall and particular in the openings, which connect two domains. An opening up of the surface by means of transparent things also concretizes the horizontal freedom in space. The barrier is no longer there to enclose space, but rather to direct it and to achieve a unification of inside and outside. Filling of a skeletal wall by large surfaces of glass “dematerialize” the building and creates an interaction between interior and exterior. Openings also receive and transmit light and are therefore main determinants of architectural character of large scale environments are often characterized by particular types of windows and doors, which there by becomes motifs, which condense and visualize the local character.



(Figure 68: Horizontal freedom in space by the surface)



(Figure 69: Surface – Dematerialized, Credit : Archt. Geoffrey Bawa)

"Dematerialized" brick surface creates an atmosphere of medieval spirituality. Transparency implies light penetrating a wall in other words, light coming from outside

The climax of Gothic space expression was the brilliant invention of the stained glass windows, i.e. the transformation of light falling on the wall image into light shining from the image itself. The Gothic window is a spatial- atmospheric phenomenon enhancing the diaphanous structure of the wall.

Hence white translucent glass was preferred in renaissance architecture, on the contrary the Gothic interior was lit by the glowing colored surfaces of the natural shade it evoked softened and smoothed the Gothic interior surfaces, thus raising perceptual sensation to an immaterial level.

How this inside outside relation feels to man? With the freshness of breeze that begins to stir only when light is faint, this colourless art is possessed by body and mind, directs its charm to the more onward thirst of the soul, a thirst that longs for seclusion and quiet.

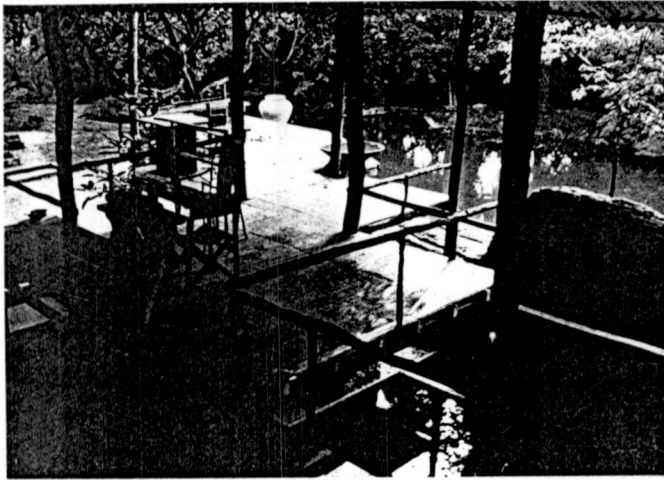


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Plain and simple light, which belong to old Japan creates such a lonely mood in traditional architecture reflects the visual and emotional experience of the soft luminosity outside. Space is barely enclosed and in a sense, was physically dispossessed by the way light seeped through and crumbled its boundaries. Part of the way these airy lines vacate space is by shifting attention away from the inside and out to the container. So that the former seems to lose substance as well as emphasis but then renders that boundary elusive, unsubstantial and subject to a gradual peeling, causing the space within to leak and dissipate.

"The surface is the meeting place of mind as well as the physical meeting place. Because a surface has an interior which is different from an exterior – have come to the point where this realization how can separate an exterior wall from an interior wall, and create space between them that could walk between, that which couldn't do with a solid stone wall."

(Brownlee D., 1997,Pg 99) ²⁰



(Figure 70: light from surface – inside flows to outside)

But what is important here is when climate changes the quality, appearance of space also changes. Space becomes rich with variety. But three-dimensionality becomes less. Space becomes flat with too much of light. Architect Tadao Ando has captured this interesting principle in his project Church on the water. This is a box of light, and under the sky stand four separate crosses. The glass frames the blue sky and allows one up the zenith. Natural light pervades the space, impressing on the visitor the solemnity of the occasion.

Argument here is that how surface enhance the spatial quality and what is the best way. Glazed surface creates more openness and relation of in and out is strong. But whole quality without any barrier, or a disturbance, creates too much light, which feels uncomfortable.



(Figure 71: Church on the water – Different experience in summer and winter.)

From there one descends a carving, darkened stairway leading to the chapel. The pond is spread before one's eyes, and on the water is a cross. A single line divides earth and heaven, the profane and sacred. The glazed side of the chapel facing the pond can be entirely opened and one can come into direct contact with nature. Rustling leave, the sound of water and the songs of birds can be heard. These natural sounds emphasize the general silence. Becoming integrated with nature, one confronts one self. The framed landscape changes in appearance from moment to moment.



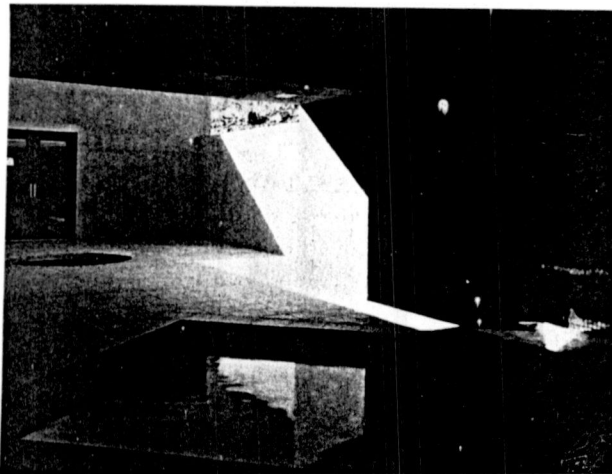
(Figure 72: Surface with solid - flesh and born in architecture)

When solids incorporate with the barrier whole spatial quality changes. Incorporation of solid means the incorporation of flesh and bones to surface. But this combination should be done carefully without disturbing the concept, which inside and outside are not separated but a single entity.

4.3.3 REFLECTED LIGHT

Life is further enhanced by the light where the reflected surface is, how they are shaped, how the light is quitted – for instance reflected through vegetation – can enhance the interplay between reflected light and space which is so crucial to the mood of a space, while bringing the outside to inside. In such a dark place some of materials draw so much light to inside itself is a mystery. Why in ancient times statues of the Buddha were gilt with gold and way gold leaf covered the walls of the homes of the nobility. Modern man, in his well lit house, knows nothing of the beauty of gold, but those who lived in the dark houses of the past were not merely captivated by its beauty, they also knew its practical value, for gold, in there dim rooms, must have served the function of a reflectance. Their uses of gold leaf and gold dust was not mere extravagance.





(Figure 73: Reflections in a darker room)

It needs care, however, reflection from water can warm a solar collector or lighten a dark room but the light is cold and there can be dazzle and glare problems. Reflections from mirrors can cause problems of deceptive space. Some designers like to play with this, but being deceived does not strengthen, a sense of roots.

People can also use reflection from natural materials and from water. As the delicate breathe of colours grass more life to the light than heavy opaque point, which emphasizes that static impenetrability of surface.

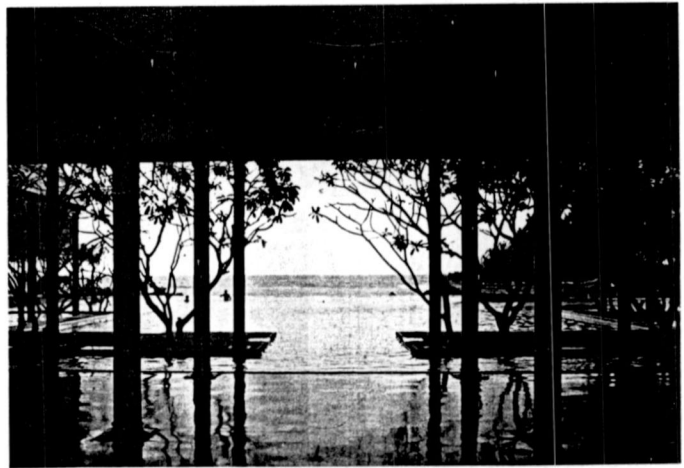


(Figure 74: Reflected light – Image on water, Lunawa house, Archt: Rathna vibushana)

On the other hand light shines in foliage it can be both life filled and peace bringing. But reflections from mirrors cause problems of deceptive. Paled light a little more by reflections off pure white sand, in Buddhist religious space flows to inside from outside to make meditative effects.



(Figure 76: Out to In: Transitional quality of space)



(Figure 75: Reflections from floor surface – Same interpretation of pool in outside)

In some places reflected light creates entirely complete image on water of the elements in built space. Conflicting of this actual and image also cause of unstable mind status, which is interesting to experience in some situations to be away from boring monotonous.

In Japan this inside and outside relationship by reflected light is clearly visible. Light seeping in from the garden has warmed a little from leaf and moss and then in certain rooms is further enriched by reflections off elements/masses. This reflected light in Zen temples vacillates between matter and spirit fading life and immanent death, the end of time and the beginning of time. Where sun does fall in abundance is onto a still pond with odd- looking, milky green water. The strongly opalescent liquid has light capturing powers similar to the mass. Rays falling on the liquid surfaces pass through many transparent, yet dense and muddy layers, reflecting back and forth and causing the marvelous substance to glow from deep within. At the same time outer most layers of water wet as half –silvered mirrors to reflect and suspend and dappled sun of several different depths. The mass and maples conspire to paint all around this walled secret garden a scattered form of light, which clings to the atmosphere around things, safety veiling nature in a shy transparent color, and casting an elusive spell people don't so much see as feel.

As with other images of heaven – the Buddhist paradise was depicted as a realm of golden light. And gold was the colour of spiritual energy and Nirvana, so that, statues of the enlightened Buddha were frequently coated with gold. A colossal instance was the great Buddha, made of gilt- bronze and augmented by a large golden halo behind it. The figure appears as if in a huge vision, climbing out of darkness, radiating divinity and revealing the immortality of an inner light. Water bounces sun into flickering patterns on the undersides of balconies and roofs; softly veiling the surface with a mix of unexpected transparent shadows and strongly angled highlights flowing over the many inclines.

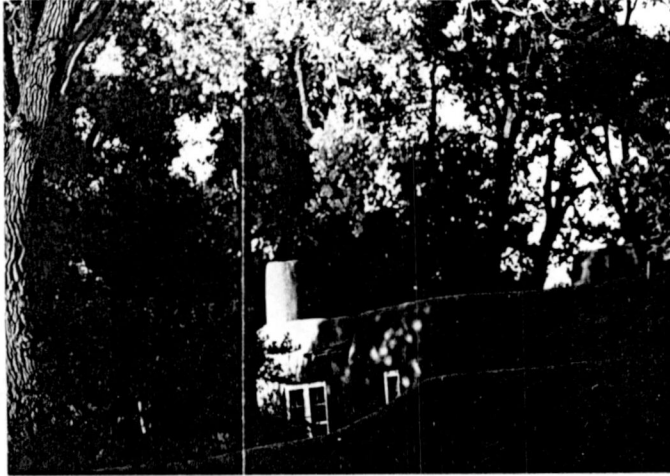
The sequence of spaces experienced in the water temple is not only meant to culminate in a spiritual core, but to pass visitor through a gradual initiation of light and shadow, unfolding through a series of breaks in existence before finally arriving at a light that has transfigured the world. This ritualized journey is inherently mystical and constructs the kind of spiritual adventure believed essential for renewing the soul. This reflected light from outside which create paths to inside has the effect of purifying and bleaching the retina, cleansing the imagination by different means.

These are only a few examples for reflected light. But explaining all the incidents is pointless. What is clear is that, reflected light with different materials, different surfaces creates contrasting moods. Architects could identify this. Then they can use this theory to create different interesting moods to space.

4.3.4 FILTERED LIGHT

"People expect to have spaces with different experiences. This variety in architecture is an essential component to consider. People need qualities appropriate to our mood of soul. At different times, they may need exciting socially stimulating places or relaxing calming places, to be in places perhaps bathed in rose, greenish or bluish light, not heavily painted but light – bathed as by light filtered through leaves, flowers lighting painted with transparent veils of colours".
(Day Christopher, 1990,Pg. 54) ²¹

Filtered light could be in different ways and it creates various moods to space according to the pattern it filtered. The sun is relating low and creates a varied play of spots of light and shadow, with clouds, and vegetation acting as enriching 'filters'. Strong sunlight becomes little bit controlled after filtered through natural elements.



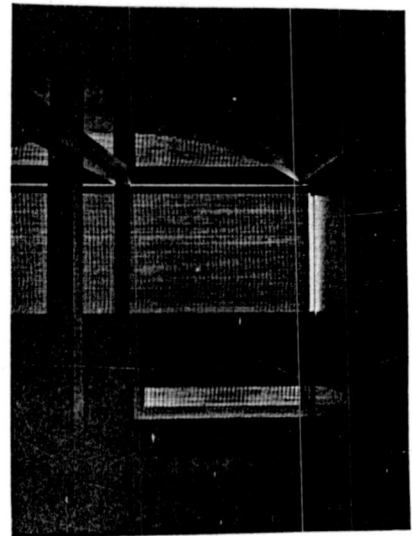
While tremendously varied from day to day and season to season the prevailing skies over every country help determine the unifying spirit of that places by the way they filter sunshine and cast an overall ambience onto the earth.



The tremulous leaves filter sun from the sky above and pour it into the walled chambers of the path. The light softly filtering through screens, meant to create a meditative form of mind.

(Figure 77: Sunlight filtering through nature)

The window and screens are another source of a gentle, prevailing charm, for the light admitted into the room is always soft restful and conducive to a meditation mood. The kind of shadowy initiation, and passage from darkness into light, appears in one form or another in most religious beliefs, and the spatial choreography of most religious architecture.



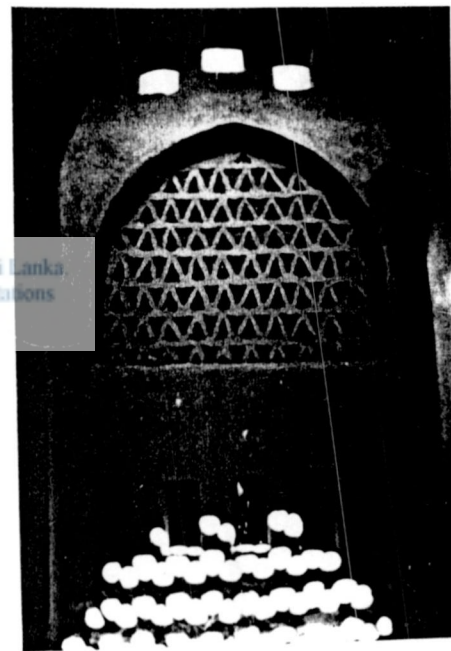
(Figure 78: Light filtering through a screen)

Especially in Zen temples in Japan natural filtering has acted to create this mood. Space to space quality is differing according to the pattern of vegetation and relation it to built space.

In their efforts to break down and ventilate walls, for selective movements of air as much as light of permeable screens that could sift a disperse, rather than channel the oncoming rays. Acting more as delicate filters than harsh apertures, these porous walls could resist the heat and humidity by intercepting sun, while allowing the faintest breeze to pass inside, all while ensuring the subtlest kind of visual privacy.



(Figure 79: Water temple by Tadao Ando –
Filtered light with emotional quality)



(Figure 80: Porous walls for visual privacy,
Credit : Archt. Hassan Fathy)

The woven wall reaches dazzling sophistication in the more permanently built lattice of bamboo, reeds and wood employing the simplest of materials in every possible density, from delicate filigrees to open senses, from woven twists to basketries of sticks, each finely turned to transmit light, according to what was on either side or the season of year.

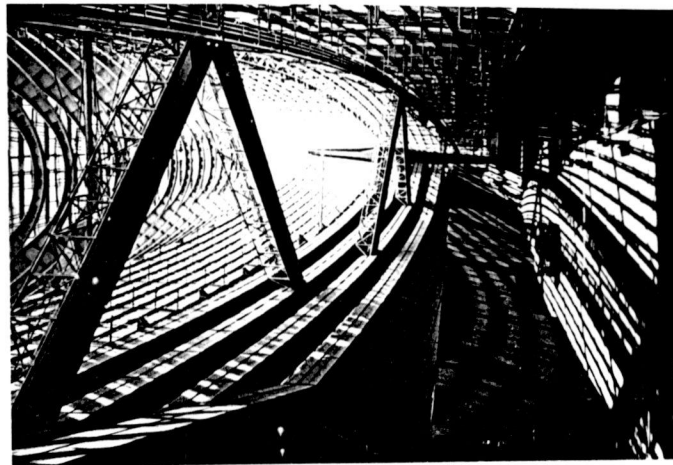
With the filtered effect interior may differ from exterior but yet the connection in-between is visible. The views and diaphanous effects through the skeletal walls vary enormously from side to side. Generally during the day, those inside can free out, while outside cannot see in. Looking out from a dark interior the views are percolated and fuzzy, while from the outside looking in, the same search turns perceptually opaque due to brightness contrast. From inside a fuzzy veil, from outside a glowing net of lines upon a black ground. Beyond its practical benefits of diffusing harsh light, and playing with inside and outside, the filtering membranes added wonderfully ambiguous features to the store of mystery and introspective feeling so distinct to this architecture.



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(Figure 81: Interior- Exterior : Yet connected with filtered light)

As light trickles through and gets caught in a screen, Matt, eggcrate, etc, the wall disintegrates into an airy substance that is half – matter and half-spirit. The wall has been created to the point of blowing away; losing all plastic substance and bulk except for a fragile tracery is almost not there. Meanwhile broad expanses of luminous scenery outside have been pulverized, shredded into narrow slivers. Lighter wall are crumbled into a fabulous concoction of brightness and shade, heaven and earth making each a part of the other and earth, getting before mans eyes into a vibrating, dusty haze at the edge of physical existence, where matter energy appears to be are and the same. Viewed through one of these screens the mood outside is also transformed. The obscured outlines and textures become soft to the eye, losing resolution, making objects less clear and less solid, less prove to logical sight. As every harsh line or tone is turned gentle and quiet, the visual field melts into a peaceful harmony. The optical blur exerts a tranquilizing effect on the viewer, similar to that of a sense – depriving grayness, darkness or translucency. The loss of tactile things in a molecular veil of light, begin to sedate the mind and eye. Within seconds at optical numbering, nerves unwind and soul relaxes.

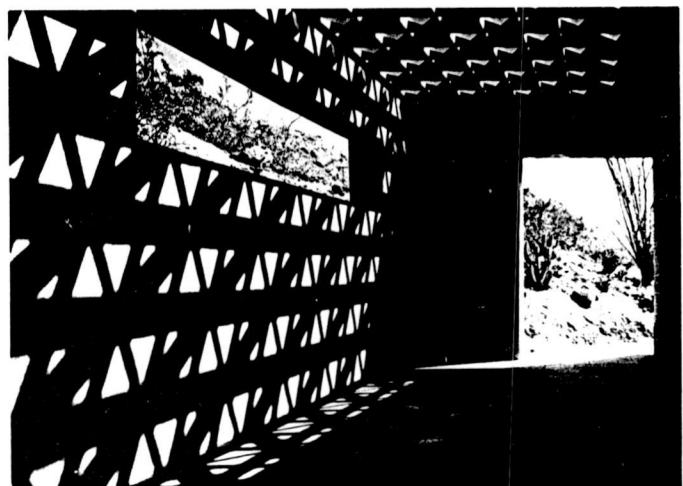
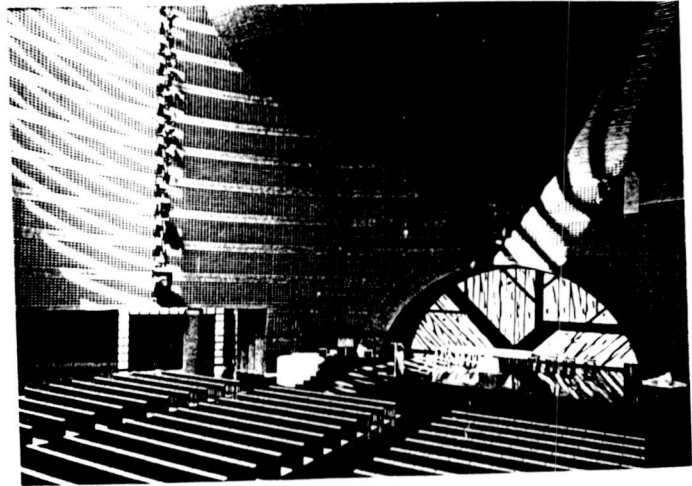


(Figure 82: Different experiences created by filtered light)



The screens in nature work as optical devices to simultaneously detach and connect. They create on the one hand a slightly withdrawn, soft –focus view conducive to meditation, but on the other hand a tranquil and even purified contact with nature.

A gently sifted light was perfectly suited for those who wanted to construct solitude still in touch with the world, which sought that difficult synthesis of a retreat kept open to the pulse of nature, and thus a union between heaven and earth.



(Figure 83: Patterns created by filtered light)

4.5 CONCLUDING REMARKS:

According to the study held in fourth chapter that is clear architects are the masters in making moods. But they are not new inventions. All are another interpretation of nature. What is available in nature has been captured in a suitable way to make emotional architecture. Recognizing / understanding natural rhythms/ patterns are important for an architect. According to the way light enters to the inside, whole mood changes. This is not an independent creation of a single notion of light; it's a combination of various light notions in same space.

However according to the three events of inside and outside relation quality obtained by light is completely different. The element, where light penetrates to inside be the element, which makes inside, outside relationship.

In the conception one this is completely a different experience because there is no inside space. But space outside is dominated with solid masses to have better spatial emotions. It is an experience of the surface, which is emphasized by the reflected light and shadow. In this case it mostly happens in religious and monumental architecture because without an interior people can't live. Emotions arise in psyche is mysterious and relates to the religious eternity.

In conception two mostly light acts as an object or elements. 'Thing ' character is contrasting. Space and light are two independent elements but light has been used to elevate the spatial quality by concentrating mind on such light elements. Enclosed space is dominant in this event and darker interior with light in elemental character elevates the powerful emotions. But here baring of that situation in long time is stressful due to high concentration of light.

However third conception is the incident where inside and outside becomes a single entity. Light and space are interacting together and quantitative representation of light completely vanishes. Man can't separate light from space. Penetration, which is inherent to architecture, is clearly articulated in this incident. Light is the path, which makes this penetration of inside and outside. This is the architecture where man understands the nature. Man identifies and lives together with nature as a different animal having intellectual perception, which is a converted image of all perceptions. But complete openness also rejected because of that, man always search intimacy of living.



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CHAPTER FIVE

Implications of spatial quality on the human psyche

CHAPTER FIVE

5.0 IMPLICATIONS OF SPATIAL QUALITY ON THE HUMAN PSYCHE.

5.1 CONCEPTION ONE: ELEMENTS IN SPACE

Main representatives, which were selected to study about, elements in space are pyramids.

The form of pyramid consists of four equal isosceles triangles converging on a single point. Plane surfaces, the constituent element of Egyptian architecture, reign supreme – a triumph of abstract form. Though its symbolic impact the pyramid merges and even competes with eternity, human endeavor has never again achieved such sublime simplicity on materializing man's irrepressible urge to link his fate with eternity. Immaculate precision makes logic merge with enigma and mystery. Light reflecting from the surface is contrasting this effect.

Sigfried Giedion says,



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"Everything was submitted to the laws of the plane surface. Through the use of this abstract element with the utmost restraint the highest form of expression was achieved."

(Giedion S., 1964, pg. 148)²²

Monumental quality of pyramids is the main focus of their construction. These monuments are capable to give strong emotions to man with their huge volumes.

Pyramids merely built for ritualistic requirement. That these ritualistic observances attained an uncanny elaboration shows the enormous power wielded by the priesthood. Every step in the transformation of the dead king into a god is echoed by its architectural setting. Illuminated surface represents God purely with supreme quality. Verticality in there structures impact to mind. Vertical is the line of movement. Movement to down ward, a lead plummet the force of gravity, sunbeams. Directed upward is a connecting link with the cosmos.

Pure planes of pyramids are more expressive. They are the elements for mood making. These vast surfaces effect to human psyche, because they are powerful in deserts

" The pyramids has no reliefs, no inscriptions, no detailing of any kind. Only smooth dazzling planes, In accessible to human approach. The power of the plane becomes sublime.

(Giedion S. 1964, pg. 296)²³

It is the most obvious symbol, pointing from earth to heaven – from earthly existence to the abode of the gods. Increased verticality of light reflecting surface affects to human psyche that superior status of God. Then man converts himself to a minor body in vast desert. Loneliness in a vast land binds man's mind with spirituality. It's a distance observation, and man cannot reach to closer with the massiveness of objects. It represents reaching to heaven is a long journey.

Reflecting masses are not inviting. Those structures force on human psyche to be in a distance from them. That's the reason of monumentality. Man doesn't live with but responds to its characters, monumentality and superiority.

5.2 CONCEPTION TWO : EXTERIOR AND INTERIOR ARE TWO UNRELATED CONSEQUENT EVENTS.

In this event light becomes objects. What is the effect of such objects to human psyche? Light object is a concentration light, which man concentrates on that object. The concentration on object is used in architecture to encourage a controlled behavior on a space. Light objects elevate this quality especially in religious architecture. Concentrated light makes attraction towards it. This strong attraction on mind stresses man to move according to that. When man enters to such a space suddenly this attraction occurs. This is the reason for his movement along the processional path towards the altar.

" In Christianity light became an 'element' of prime importance, a symbol of conjunction and unity, which was connected with the concept of love."

(Shultz Norberg,1980,pg.31)²⁴

According to Norberg Shultz that it is clear elemental treatment of light and its effect to man. God represents love. This concept symbolically expressed by the light elements, which are the main attractions in a church.

Here main issue is that whole entity is one independent unit. There is no connection with exterior. Whole mind converts to religious eternity. But there is a limited time for this concentration. Human psyche does not accept this strong concentration further. That is the reason to which man feels uncomfortable when he spend longer time in a church.

Surrounding darkness increases this quality. But then how priests and others, who are living in churches bare this extreme quality? Because of the practice they have to concentrate mind, helps to them to be in a church. It's a stage of psyche, which is elevated by meditation and other rituals.

Human psyche converts visible things in to images. Concentrated light patch on alter, catches by eye converts to a form of representation of God. Mostly the objects are placed in a higher level, without any connection to outside. This emphasizes the supremacy in religious thought, heavenly representation. This supremacy forces man's inner self to worship. Spirituality within the space affects to psyche.

Final effect is concentrated light object creates enlighten, representation of God. This control in mind is directly influenced to control of body.

5.3 CONCEPTION THREE: EXTERIOR AND INTERIOR ARE RELATED INTERDEPENDENT EVENTS.

Conception three is about spaces when interior and exterior becomes together. In this event barrier is not to enclose the interior but to make connection in between inside and outside.

Human psyche expects to have this condition for the peace of inner soul. These sort of spaces are food for spirit of man, and for ecological balance. This interaction creates moods in mans inner soul life, that gives the balance what man need. This quality of space is life renewing, soul nurturing and spirit strengthening.

In Churchill's words,

"We shape our environment and our environment shapes us"

That means man and environment are interdependent. This is why man always with environment and when he away from that he becomes sick.

How this concept is achieved in spatial conception three.? When outside and inside becomes one, experience got in inside is varied, due to changing pattern of nature. Man needs this for renewing his stressful mind. Light makes the fusion of in and out. Light is the path for mind to move from in to out. This happens when perception creates images in the psyche. Man doesn't feel that he is enclosed or tight into an intimate space. But this situation also changes due to the psychic condition. If man reveals that out also as a part of in or inside as a part of outside, then mind feels that whole entity as one. Intimacy will create there by the natural barrier- sky, earth and vegetation. Architecture needs this natural extension to create healing quality in man's heart.

"A boundary is not that at which something stops but, as the Greeks recognized, the boundary is that from which something begins its presencing. That is why the concept is that of horismos, that is, the horizon, the boundary."

(Heidegger M., 1975, pg. 154) ²⁵

That is the reason for that boundary becomes that much important in the architecture. Man as other animals try to make boundaries for their premises. It should not definitely be a solid wall or partition. It could be a line on ground, a level difference or vegetation.

"When there is no ceiling, the sky acts as the upper boundary, and space is, in spite of lateral boundaries, part of 'exterior space'."

(Shultz Norberg, 1980, pg. 59)²⁶

It is clear man always bounds himself by at least an imaginary boundary. So it is an individual psychic experience, which is perceived by man. Man expects this connection with outside for the healing quality of his inner soul.

" Intimate space loses its clarity, while exterior space loses its void, void being the raw material of possibility of being."



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(Bachelard G., 1969)²⁷

Intimate space, which man expects to be in is a product of nature. Intimate space is moulded by the nature and it's contained in the exterior space. When these two becomes together that concept of boundary becomes one, which bounds all interior and exterior.

" The two kinds of space, Intimate space and exterior space, keep encouraging each other, as it were, in their growth."

(Bachelard G., 1969)²⁸

Man is a half animal. He always prefers to be with nature. But his intellectual mind creates enclosures around him. However even he is in an enclosed room, he expects glimpses of outside. Man has a capacity to bare that encloseness, which has being developed with his intellectual development during centuries. But long time separation from nature makes him sick. On the other hand Total "openness" also makes problems. Fully opened to nature means lack of security. That's why this argument says intimacy is expected in some extend This is the place where architect introduces flesh and bones to architecture. When barrier is with solidity into some extend, that third conception becomes successful in reality. That's the situation where "humanity " occurs on the space.



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SUMMARY

Argument of this study, which is analyzed further, is how space in architecture involves with daylight for elevating emotional content of space. Basically it was achieved in a process of few steps.

1. Architecture as an Art:

Architecture represents a form of art. But study reveals that architecture is an art with a different spatial conception. This is the three dimensionality and experiential quality.

2. Relationship of art and light and how it effects to architectural space conception:

Art enhances its quality with light merely for the purpose of observation. But architecture relates to light with human behaviour. So this study reveals that light and its relation to architecture is important in conception of space because it directly influenced to the behaviour.



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3. Spatial conception of architecture in relation to light:

- Architecture always dealt with people and the environment. Architecture derived from the context where it is placed. Contextual relation in architecture is achieved by moulding of space and mass. When consider about this combination of form makes larger impact to the context.
- Form is the composition. Composition is how space enhanced with physical elements, like mass and light. It is achieved by articulation their proportion, scale, volume, etc.
- When this quantitative light strikes on a surface, quality is expressed.
- This resulted quality, considered as the essence in light, which enhances the quality of space.
- Most important outcome, which search in this part of study, is the fusion of mass and space.

4. Fusion of Mass and Space:

- Spatial quality is an intangible component which person can be identified by his senses. It is how man perceives this.
- Mass together with space creates the spatial quality.
- Light has major role in this sense. Articulation of mass and light reveals abstract quality in architecture.
- Mass is the solid quantity in architecture. Architect moulds architecture especially in the barrier.
- Manipulation of barrier is important in this sense.
- Manipulation/moulding of barrier results inside – outside relationship.

5. Inside – Outside Relationship:

Architecture is a spatial drama. This is emphasised by the relationship of inside space and outside space. Philosophers have identified this relationship in major three events.

- I. Elements on space.
- II. Inside outside are unrelated consequence events.
- III. Inside outside related inter dependent events.

6. Role of barrier in making relationship of inside and outside:

As realised by the study barrier is the most important element in this in/out relationship. Barrier takes light air, sound to inside or releases them to outside.

7. Barrier as a converter of daylight:

Architecture moulds barrier to take day light to inside in different ways. This is the practicality in architecture. Effectiveness depends on how this is done. This is the path to light come in directly or indirectly.

8. Finally which was achieved by this study is how daylight with the space creates different spatial qualities and how they are applicable for human feelings – emotions.

That analysis reveals,

Elements of Space :

Light applies in this event in two basic ways.

- Reflected light – create dominance and vertically to those elements by revealing edges.
- Contribution of shadow – shadow makes 3D quality well enhanced.

With the reaction of light in those ways monumentality represents well, with the space surrounding – vast barren land. Emotions awake by this action are more sacred, or religious, due to the way that they stand on the ground. According to the quality expressed by light the mood inhabited in space also vary.

Inside, Outside unrelated consequent events:

This event two domains are exist – inside and outside. But not relates to each other. But light has a role to give quality to space. Light taken from barrier. But outside and inside separated from the same barrier. Here barrier has dual role. Light becomes objects/elements. They are attractions. Mostly in religious spaces this conception works well. Attraction of mind is the main theme of light in this case. It enhances spatial quality and makes mood to it.

Though light comes from outside, effect from out to in is minimum. But importance is light can simultaneously change these two domains spatial quality.

#. Inside and outside are related interdependent events:

In this event inside and outside are communicated together. They are inter - playing. One is dependent on others quality. Barrier is the component, which this bond makes stronger. Barrier can be manipulated into different ways to have this connection. Sometimes barrier becomes only a frame. Here role of light is decisive important. This situation is the architecture which people use to live. People like to be with nature. That is the special conception here more penetrable. When day light changes the natural environment also changes. With that built environment also began to change. Moods create by this is so variable. This context is enriched with this changing pattern making maximum penetration.



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CONCLUSION



CONCLUSION

Architecture is a quality; an emotion, which gives man mental peace as well as physical comfort, hence when both are integrated and stimulated, made a physical reaction. Architectural quality is not for enjoyment but it is a pleasure of tasting, an enriched spirit and an identification of the presentation that attaches to the mind. Quality, which is experienced in architectural space, is personal and that comes from man's inner self, as an inner transformation of his imprints stored from worldly life.

It is hard even to recognize the need for such inner transformations. This transformation occurs in human psyche with the quality of architectural space. This psychic condition elevates with spatial quality of how it is perceived by man. Quality of space is enhanced by daylight when there is proper fusion of mass and space. When light strikes on space that so called quality is expressed.



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Today the situation is reversed – quality and utility are widely regarded as completely separate streams. Man need utility but quality is considered to be an indulgence, peripheral to man's main concerns in the life. When quality is ignored the result is the enormous use of day light without an understanding and control. This misinterpretation of nature contributes modern disharmony, in architecture.

Man is inventing things to fulfil requirements with demanding situations. However artificial light is demanded in present situation. But problem is that use of artificial light couldn't be contributed to that transformation in inner soul. The real situation, which results, is meaningless architecture.

Then the question, which matters, what will happen in the next century? It's upon to man and his interest about quality. If this present situation continues, artificial light may over power and quality, which elevates by daylight will completely be neglected.

However when man gets tired with this technical approach he may search for the way in which historical man performed the quality with the manipulation of daylight. This spirit of space has been captured by few of contemporary architects. Whether this can be continued or interrupted is again decision of man who lives in such spaces.

Nowadays it is quite impossible to return to pre industrial values. People need however to be sure that they have carefully thought about what previous generations took for granted before they depart too radically from them.

Few of contemporary architects have identified this context properly and that is visualized by their products.

1. E.g.; Architect Tadao Ando has produced marvelous architecture by emotional use of daylight in buildings like, Church in water, Chapel on Mount Rokko, Water temple , Kidosaki house and Church of light.
2. E.g.: Architect Geoffrey Bawa with his experimental pattern of architecture has being use to produce more sensitive built environments especially merging with the natural environment and harmonizing the space with natural light.(Lunu Ganga, Hotel Triton, Integral education centre- Subodhi)
3. E.g.: Diya Bubula, which was designed by artist Lucky Senanayaka is complete interpretation of nature while without any separation with the environment.

These attempts are precedents for future architects to carry on this meaningful architecture further without any harm to nature, man and built environment itself.

People need qualities appropriate to their mood at soul. At different times they may need existing, socially, stimulating places or relaxing, calming places to be in. When they are exposed to stressful situations, it is as great a support to experience peaceful surroundings, also they need qualities appropriate to present a state of development. Argument is that returning to previous state that harmonizing nature and spatial quality, which is enhanced by natural rhythms does possible this urbanized situation. Present polluted, urbanized environment may not allow such interesting penetration with nature. Also high technological interiors may not accept this natural penetration, and daylight may not further enhance the space with such fusion discussed in this study with the relation of human psychic. But choosing what is appropriate will be determined man, by offering environmental supportive balance development. Inner freedom depends upon this balance. This study will make a contribution to achieve that balance approach in architecture with regard to the quality of space, which can awake the inner soul of a human being.



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Limitations:

- Emotions and spatial qualities are not only obtained by light itself. It's a combination of other elements like, view, sound, texture, breeze, etc. All together makes this emotional context in architecture. But this study directed only towards daylight. Because daylight is the main by which helps to enhance spatial qualities better than others.

- Study limited to day light without considering artificial light. Both of those two elements are important in this sense. However, architecture should manipulate daylight. But artificial light is something already available, which is already produced. So studying daylight is important because when it is on space, it is a product of an architect.

Outcome

Nature always makes aware man. Architecture is another further interpretation of nature. What architects do is re interpretation of nature's philosophies. However architect's duty is to identify these natural creations well and apply them appropriately. The application of daylight also is important in this sense. This study is further emphasized that natural philosophy. What light can do is when it hits on a surface is the essence in space making in architecture. Man always with this natural ways, which can awake inner soul of human being.

This application reveals that every beautiful work of architecture should be attained to express one of these moods and the feeling of the space is a reflection of particular man's innerself that is depending upon when get background of imprints through worldly experience. Thus architect's task is to imitate the spirit of nature and life. Each space, each material, each element is a revelation of its true nature.

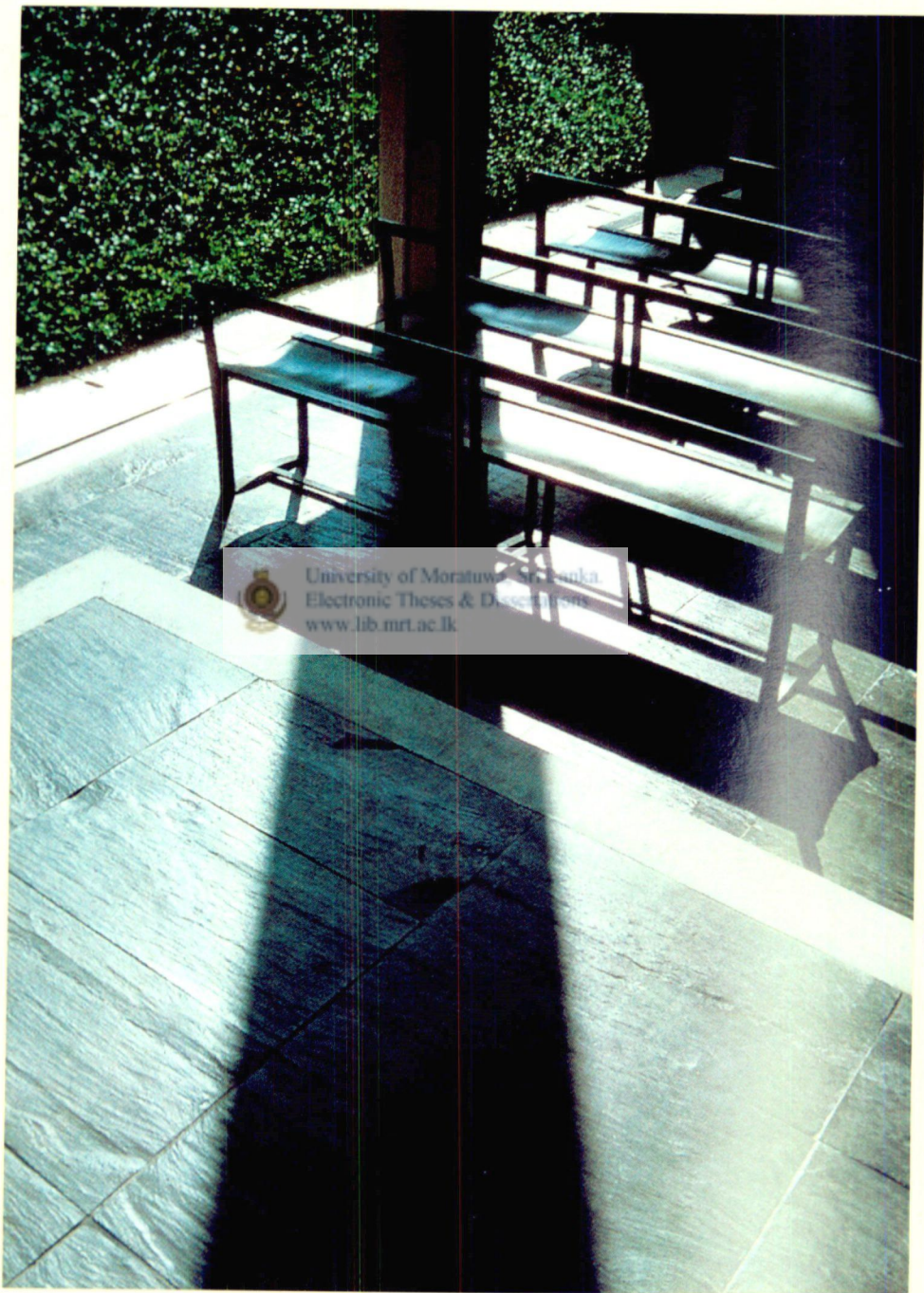



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This whole study is a foundation for further study of emotional content in architecture. It could be studied with relation of other elements like sound, breeze, texture, view etc, which makes perception of space.

It's however, hoped that this study would contain basic information guidance, and more importantly open up a path for more deep research on the same direction, which has become quite a relevant task to be performed today.





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