ARCHITECTURE AND THE ESSENCE OF MATERIALS

WITH SPECIAL REFERENCE TO THE RELATIONSHIP BETWEEN THE ESSENCE OF MATERIALS AND SPIRIT OF PLACE

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ARCHITECTURE AND THE ESSENCE OF MATERIALS

Abstract

Architecture is the composition of material in creating built form. The material component of a building creates forms and spaces desired by the architect. The nature of the material in use of transforming idea into matter is two fold.

The physical nature of a material used in a building is its strength, texture, surface and colour. The selection of a material for its finish, texture and colour stimulate an emotional response. The physical nature of a material evokes a sensory experience for we can touch, smell, see and feel the space created. It makes architecture solid and tangible.

The second nature of a material is its essence. Any material has a characteristic woven around its being. This signifies the traits and peculiarities original to the material. This essence of material contributes to its physical nature. It also gives rise to understanding the built form at a deeper level triggering connotations and symbols. The essence of a material unites the materials to give meaning to the building. The essence of material becomes a medium of expression in architecture. "Every building is born in the mind of its creator reflects how the elusive qualities of human consciousness are poured into places of dwelling." 1

Materials create an enclosed space. This space is placed on a site that lends its quality or spirit of place to the built form. It is necessary to understand the generators of the site, site condition and material composition of the site. The architectural response should enhance the spirit of place of the site. To enhance the spirit of place the architectural response should harness the essence of the material along with its physical qualities. The essence of materials should be related with the spirit of place. Architecture then becomes a sensory experience. It awakens a deeper level of understanding of the nature of being. The science of understanding the nature of being through the

fundamentals, the essentials, the intangible and spiritual nature is known as the Metaphysics. The essence of materials in relation with the spirit of place makes one experience the metaphysical level of being and thereby a unity in architectural experience can be achieved.

1. Lawlor, Anthony. **The temple in the house.**
P. Putnam Books. 1994. Page.4

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INTRODUCTION

ARCHITECTURE AND THE ESSENCE OF MATERIALS.

INTRODUCTION

Need for the study.

Architecture is a combination of materials. A material consists of physical qualities and an essence. The physical quality of a material is its strength, texture, surface and colour. The physical quality of a material evokes a sensory response. Architecture becomes a tangible and sensory experience.

The second nature of a material is its essence. The essence of a material awakens a deeper understanding, trigger connotations and symbols. "Every building is born in the mind of its creator... reflects how the elusive qualities of human consciousness are poured into stone and brick spirit transforms matter into places of dwelling." 1

The "elusive" qualities of human beings are the responses to the world and the nature of being based on the deeply rooted knowledge gathered during childhood experiences. This knowledge colour the way we feel, the way we experience, the way we aspire and the way we strive to understand the nature of being.

The essence of materials is a medium of expressing ideas. The essence of a material results in a unity in architecture. A unified architectural experience must acknowledge the forms and spaces created by materials, the hierarchy inherent in the functions they accommodate, the users they serve, the purpose and the meaning conveyed by the very materials. The built form should harness the landscape and context in creating architecture that is related, interdependent and reinforced with its surroundings. The architectural experience should draw on the knowledge, associations, symbols and aspirations of the user.

Problem Statement

The essence of a material deals with concepts and the association of the materials with the character it emanates. It is an essential component in understanding space created. By drawing on a deeper level of understanding the essence of materials transforms the physical quality of a material to its essential quality. "Architecture combines external forms and internal space, structure and materials into one essence" 2

The essence of materials in architecture enhances the individual or particular or unique nature of the site. The spirit of place and materials composing the site should be understood. The architectural response should enhance the spirit of the site with the essences of materials used in the building. The transformation of the architectural idea and concepts into built form is understood through the material. The essence of a material must be understood to comprehend the quality of space the architect has created.

The links of the material with its essence is very often ignored in the competitive building industry. The reasons being, with the advancement of transportation during the Industrial revolution materials could be transported to any destination. Due to Globalization and advances in transport, labour and technology materials could be taken away to far destinations. There is a creation of an architecture that has lost the primary essence of the material. The essence of the material is not harnessed to create architecture. The material has lost its authenticity and meaning. Therefore the essence of the material has not contributed to the spirit of place, the building and user. The sensory experience of architecture maybe lost and a wrong interpretation maybe derived. The user will be deprived of comprehending the essence of materials. The unity in terms of architecture is lost.

Background

The use of materials from the earliest days of man up to this day is evolving and changing with time, circumstances, society and human development. To create any type of place the space must be enclosed. The availability of materials, the prevailing construction techniques clearly influence the forms of building.

Comprehension of the manner in which materials have been used in various built form and how all these methods contribute to expressing architecture and the society of the time, is a necessary tool in understanding built form.

To understand what a building is about, the physical quality of a material and the sensory experience it creates must be understood. The essence of the material enhances the site, the building and the context. The essence of material along with its physical nature enhances the total architectural experience. For it triggers ideas, concepts, symbols and -connotations.

The essential nature of materials is not just for a mere backdrop for design but it is a combination of materials that have fused together to create architecture. Understanding the essential nature of materials and its contribution to architecture is a need. For architecture is a sensory experience and material meaning touches our senses. To understand and comprehend space the eye, ear, nose, the sense of touch, the sense of taste and mind should be able to identify and orientate. The essence of materials relates associations and links between the past, present and future, thereby creating a unifying experience of the being and the world.

Scope of the study.

The homestead derives the concept of living. It is the basic family unit and the beginning of the society. The essence of materials in enhancing the spirit of place in a house is of a domestic quality and is of human scale. The scope of the study examines the essence of materials enhancing the spirit of place in a domestic level.

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CHAPTER 01

CHAPTER 01

ARCHITECTURE AND THE ESSENCE OF MATERIALS.

This chapter aims to focus on the relationship between architecture and the essence of materials. The importance of understanding this relationship as a technique of expressing architecture is examined. A material being a medium of expression is looked into. The essence of a material is studied in depth. The contribution of the essence of materials in enhancing the spirit of place and thereby creating a memorable and symbolic architectural experience is analysed in this chapter.

Why is it important to understand the essence of materials in Architecture?

The relationship between architecture and materials is timeless. Material invention has signified the history of architecture for the discovery of new materials and new methods have created landmark changes in architecture. Generation of new form creates the evolution of architecture and materials thereby play a vital role in architecture.

The use of material is a way of expressing Architecture. It is a technique of expression. The purpose of a technique of expression is to interpret the manner in which architecture is put together. The techniques of architecture form structure using particular materials. These methods are influenced not only by the availability and character of material but also by the total technological development of society. For Architecture depends on an organized labour force and upon the existence of the tools and skills necessary to secure, manufacture, transport and work durable material.

Two forces condition the evolution of techniques. One is economic- the search for the maximum stability and durability in building with the minimum of materials and labour. The other is expressive- the desire to produce meaningful form. Techniques evolve rapidly when

economic requirements suggest new expressive forms or where the conception of new forms demands new procedure. The characteristics of materials that are important in expressing design techniques are the properties of their composition such as weight, durability and the way they are used in structures. The properties maybe expressed and interpreted by the treatment of the surface and their use maybe expressed by emphasis on the dimension and joinery of the units into which they are formed.

Therefore the technique of expression is seen as an Art- a creative interpretation that heightens the awareness of the nature of architecture. Structural devices and the materials used in buildings provided architects an opportunity for expression in the earliest civilizations.

The climax of circular sanctuary in Stonehenge, Wiltshire, England is an indication of the development of man and his building craft. Completed in 1500 BC the design and structure of the Sarsen stones and blue stones from South Wales have made Stonehenge a symbol representing primitive man and his mark on landscape.

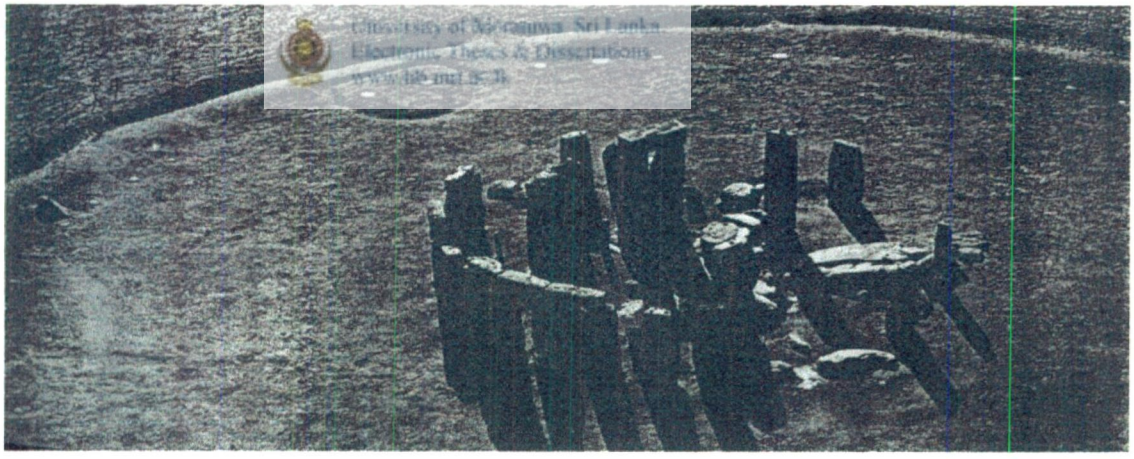

Figure 01

(Source: Jellicoe, Geoffrey and Susan, "The landscape of Man". 1987, page 17)

From Primitive man to the Ancient worlds and till today the use of materials have exemplified the development of mankind. The relationship between materials and human beings originated from the time primitive man started hunting for his survival and seeked means

to protect him from the elements and animals. The uses of materials and building techniques have always been a means of expressing the way of life, the society and human development. Material essence has contributed to architecture and human civilization throughout the history. This relationship has brought about new inventions and creations that have created landmark changes in the history of time and architecture.

Meaning held in material

Materials in architecture are used to enclose and create space. It is a medium of expressing the design concept and the ideas of the architect in built form on a given site. A material expresses itself by two inherent qualities that are unique to each material. The two qualities are the physical quality of a material and the essence of a material.

The physical quality of a material.

The physical quality of a material is its strength, texture and colour. The physical quality of a material goes through transformations of raw matter by the use of heat, chemicals and generative processes. This will reflect changes in its strength, texture, surface and colour. For example the ancients experimenting with alloys such as copper and tin produced a new metal, bronze with a lower melting temperature and improved casting properties.

The ear, eyes, nose, skin, tongue, skeleton and muscle measure the physical qualities of matter, surface, texture, colour in a given space. Every significant experience in architecture is multi sensory. "The task of architecture is to make visible how the world touches us" 3
The physical quality of a material enhances the way we experience architecture sensually. For materials and surfaces have a language of their own. "Stone speaks of its distant geological origin, its durability and inherent symbolism of permanence. Bricks make one think of earth and

fire, gravity and ageless method of construction. Bronze evokes the extreme heat of its manufacture the ancient process of casting and the passage of time as measured in each patina. Wood speaks of its two existences and time scales, its first life as a growing tree and second as artifact made by the caring hand of the carpenter or cabinet maker. These are all materials and surfaces that speaks pleasurably of time." 4

The visual, tactile or auditory effect of buildings makes impressions on us and is the means in which all meanings are conveyed. "Architecture is seen by the eyes, felt by our fingertips, sensed by our body through the heat or cold, heard in the throwing or muffling of sounds, reached out by muscles in the way of physical effort of walking, stooping and reaching out." 5 In Japan and throughout the Islamic countries people sit on the floor and this has had a significant and easily discernible effect on architecture. (Brawne, Michael-1992) This illustrates that, the touch of architecture influences people and becomes a generator of a design. The touch of architecture or the tactile qualities in built matter can be directly attributed to the physical quality of a material. The physical quality of a material is an essential component in materializing design ideas to form.

The Essence of a material.

Each material is like a living element for it has an essence, a character, an aura and texture that are its own. Materials will help create the substance of a building. Timber as an architectural building material is sensual, warm, and rich in grain. If timber may be personified in our material world the following statement has captured it "Wood comforts us amid the anguish of our fairytale-world...When we carve wood, we are seeking ourselves, we satisfy our inexplicable longing for the past" 6

A material has a presence woven around the very core of it. The presence of a material has traits that signify its characteristics. It's the property of that material which is already there, lying at the ground of the thing. The Greeks called the core of a thing which is already there, lying at the ground of the thing *hupokeimenon*. The senses of sight, hearing and touch are sensations

of perceptibility of a thing and this sensibility is *aistheton*. The thing is thereby a unity of a manifold of what is given in the senses.

It is this essence of materials that is conveyed by Martin Heidegger's core of a thing in which he states "A thing, as everyone thinks he knows, is that around which the properties have assembled. We speak in this connection of the core of things." 7 A material too is an assembly of traits particular to its own characteristics.

Every material possesses its own language of forms, and none may claim for itself to the forms of another material. For forms have been constituted out of the applicability and the methods of production of materials. They have come into being with and through materials. No materials permit an encroachment into its own circle of forms.

The essence of a material deals with the concepts, associations of the particular material for the character it emanates. Materials are endowed with meaning and initiate feelings, trigger connotations and address the deeper levels of our understandings. (Slessor, Catherine.2000) The material essence contributes to the larger context, which is known as the metaphysics of material.

Metaphysics is the science that seeks to trace the branches of human knowledge, the spiritual, the intangible and the philosophical to their first principles in the constitution of our nature. It aims to find the nature of the human mind and its relation to the external world. It is the science that seeks to know the ultimate grounds of being or what it is that really exists universally. "Metaphysical-Branch of Philosophy dealing with the nature of existence and of knowledge" 9

The essence of materials and metaphysical qualities of materials contribute to express Architecture, Cinema, Sculpture and Photography. Photography is a composition of materials. Cinema is a collection of ideas that are revealed and conveyed using the texture, dialogue, colour and meaning of material. Art and Sculpture moulds and fuses materials creating a work of art. Paintings explore the way we enjoy colours, shapes and arrangement. The poet might

engage in subtle areas of meaning that are most readily conveyed by words. Music in particular can directly affect our emotions. The composer of a musical score must be familiar with the various instruments to have necessary control of the instruments.

In architecture such control is associated with knowledge of material and construction technology. The use of the essence of materials is not just for a mere backdrop for design but it is a combination of materials that have fused together to create architecture. Understanding the essential nature of materials and its contribution to architecture is a need. For architecture is a sensory experience and material meaning touches our senses. The material, its meanings and connotations awaken the deeper levels of our understanding of the nature of human mind and its relation to the external world.

Therefore the ability of architecture to contain intellectual content, social meaning and to be able to alter some of our psychological and physiological status maybe attributed to the essential nature of a material from which the built form is derived. The relationship between architecture and essence of materials must be perceived to understand the symbolic meanings, the connotations and the contribution of materials in building up of a unified architectural experience.

Contribution of the Essence of Material to spirit of place

In the phenomena of man-made places materials contribute decisively to characterization. Materials like stone, brick and wood have different presences, which help to express the way buildings, are on earth. The essence of material contributes to the site. The composition of natural elements and materials in the site gives it a spirit of place. For a site with its surroundings and its constituent materials makes each place unique. "A place is a space which has distinct character." 10 The materials used by the architectural response and constructional techniques should bring out the essence of the site.

Once upon a time, the materials from which a building was made came virtually from the site itself: stone was cut from the local quarries and timber from neighbouring forests; bricks and tiles were baked in clay from nearby pits. "There was a strong link between the artifact and the earth from which it grew that was not just economic, but deeply satisfying at a psychic level as too." 11

Since ancient times the spirit of place has been recognised as a concrete reality man has to face and come to terms with in his daily life. "Since ancient times the genius loci or the spirit of place has been recognised" 12

The essence of materials when harnessed to architecture has created new ways of thinking and many a movement has its own particular material that has gained symbolic value of the era.

Mystical attachments of primitive cultures to the land are a testifying element of the care with which land is treated and houses are placed on it. Amos Rapoport says the importance of a site when building is shown by these attachments. The importance of a site can be measured by its physical nature. The topography of a site may vary from being flat, to one of an inclination or with a slope. A site with different types of rock, soil which results in its run off. The hues of vegetation and the microclimates it creates. These physical attributes of a site which affects built form is again linked with a cultural, religious and symbolic implications. " The *Hogaku* system of orientation in Japan determines the location of Japanese house without regard to topography, while in India houses on steep hillsides are so strictly orientated to the East that the doors face the slope. Stones and hillocks have a stronger earth powers than lowlands in Lithuania, so buildings are placed with consideration of this belief." 13

The appreciation of a building in its surroundings and the implications it bears on the landscape is due to the contribution of the essence of materials. The essence of the materials helps to characterise and materialize design concepts into forms and spaces. By unifying the site with the building, essence of materials contribute in experiencing a sensory and symbolic architecture.

Basis of understanding essence of materials in architecture.

To understand a building one must discover how it was designed, for what purpose it was designed for, at which location, with which constructional techniques in employment and how it reflects the sensations of a specific time. The building's space and form is experienced by its surface, texture and colours. The building relates a story of the human development, its context and surroundings in a given period of time.

The basis to understand how the essence of materials contributes in expressing architecture is examined through the architectural response combining the essence of materials. By this combination, the built form enhances its surroundings and site thereby creating a unifying experience.

Architectural response: sense the effect the architect intended realize in his mind's eye considering

a. type of use
b. type of user
c. type of location and spirit of place

e.g: fear and horror in a dungeon
Homeliness in a residence
Respect in a government institution

Material essence: Establish whether the architectural response is harnessing the material essence by using the :

a. Physical qualities of the material: Identify form of material. A material will be of three forms when used as a building material: Material in raw form, material in a converted form (The raw material converted in the form of sawing, cutting and shaping and joinery.) and materials in a manufactured form .The technology used and the availability of the material should also be taken into consideration

b. Essence of the material- The material concepts, traits, symbols and it's associations in the past, present and future and sensations created.

Architectural Response + Material Essence = A unity in Architectural Experience

In doing so the above formulae maybe derived where the architectural response together with the essence of materials creates a unifying experience with the site and context.

A unified architectural experience will acknowledge the forms and spaces created by materials, the hierarchy inherent in the functions they accommodate, the users they serve, the purpose and the meaning conveyed by the very materials. For the architect, first senses the effect that he intends to realize and sees the rooms he wants to create in his mind's eye. He senses the effect that he wishes to exert upon the spectator: Fear and horror if it is a dungeon, reverence if a church, respect for the power of the state if a government palace, piety if a tomb, homeliness if a residence, gaiety if a tavern. These effects are produced both by the material and the form of space.

The use of a material in realizing a design concept is two-fold. Firstly the physical appropriateness of the material in contributing to the spirit of place through a sensory experience should be analysed. The properties of a material and its composition such as structure, weight, durability and the way they are used in structures is the physical appropriateness of a given material. The properties maybe expressed and interpreted by the treatment of the surface and their use maybe expressed by emphasis on the dimension and joinery of the units into which they are formed.

Secondly since every material possesses its own language, and since none may claim for itself to the forms of another material each material with its different presence helps to express the way buildings, are on earth. The presence of a material has traits that signify its characteristics. It's the property of that material. Martin Heidegger's core of things where, a material is an assembly of traits particular to its own characteristics and the material presence being woven around the core contributes the characterization of a design concept into a built form.

The essence of the material should be the binding element of the spirit of place, architectural response and materials used. The built form then should harness the landscape and context in creating architecture that is related, interdependent and reinforced with its surroundings. The architectural experience should draw on the knowledge, associations, symbols and aspirations of the user.

Symbolic architecture with essence of material

Ananda Coomaraswamy states Symbolism is "the art of thinking in images." 14

It is the essence of a material that transports idea into built form. This transformation of meaning using the medium of materials creates a unity in architectural experience. The essence of a material awakens a deeper level of understanding and trigger connotations and symbols of an architecture created.

The ability of man to experience his life situations as meaningful is a basic need. The purpose of a work of art is to keep and transmit meaning. Norberg-Schulze in Genius Loci says, " ...the task of the architect is to create meaningful places, whereby he helps man to dwell" 15 The ability to create meaningful places enhancing the spirit of place triggers associations of past, present and future. Man is able to orientate himself to the nature of being using associations and symbols. This association with symbols can be traced back to the very beginning of mankind at the Creation of Man.

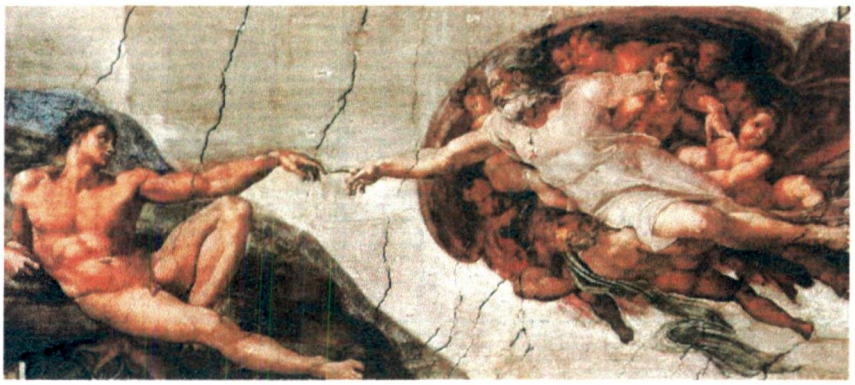

Figure 02

(Source: Gombrich, E.H-1992: "The Story of Art". Page 236)

The connection between created and Creator is apparent in the symbols. Symbolism is the science of the relations that unite the created world with God. It is through symbols that the material world is associated with the super natural world.(J.C. Circlot-1971)

Everything is linked by a system of correspondences and incorporation. Our response to the world is based on a deeply rooted knowledge gathered from childhood experience. As children we learn to walk, jump and swim with considerable effort. To learn to taste, touch, feel and these experiences colour each individuals perception of life. Man in early society became aware of himself in a world, wide open and rich in meaning. The Pigmies of Equatorial Africa believes that, in the rainbow, God expresses his desire to communicate with them. That is why as soon as the rainbow appears they take up their bows and shoot at it. Symbolism adds a new value to an object or an act, without violating its immediate or historical validity. Seen in this light the universe is no longer sealed off, nothing is isolated inside its own existence.

The essence of a material transports idea into built form. This transformation of physical to metaphysical meaning using the medium of materials creates a link between the human existence and the world. The material presence that is woven around the core of the material contributes to the characterization of a design concept, triggers connotations, symbols and helps to express the way buildings are on earth.

Architecture, which is symbolic, can be identified from the following characteristics of a symbol. A symbol

- Nothing is meaningless or neutral: everything is significant
- Nothing is independent; everything is in some way related to something else.
- The quantitative becomes the qualitative in certain essentials, which, in fact, precisely constitute the meaning of the quantity.
- Everything is serial.
- Series are related one to another as to position and the components of each series are related as to meaning. This serial characteristic is a basic phenomenon. Which is as true of the physical world (in its range of colours, of sound, of textures, of landscapes, etc) as of the spiritual world (in its virtues, vices, humor and feelings)

The appreciation of symbolic implications on building by J.E. Circlot identifies five factors.

- The beauty of the whole
- The constructional technique
- Its period-styling bearing in mind geographical and historical implications
- The implicit or explicit cultural and religious values
- The symbolic meaning of forms

With the ever changing environment that is volatile and shifting man always desires to establish himself either individually or as a family unit. By drawing on his past experiences, his aspirations, dreams and knowledge he learns to co exist with a society. A point of reference is needed and it is this point of reference that incorporates him with the world around him. Everything in the world has to co-exist. Therefore "Human beings need symbols, works of art which represent life-situations." 17

Symbols play an important factor when identifying oneself with the world around him through his cultural, religious, social and past experiences. Architecture is the basic shelter of man. It should enhance the quality of life of human beings. To do so it must contribute to the well being

of the body and mind. By creating spaces that evoke an emotional response, that draws associations, connotations and triggers the deeper understanding of one self, architecture becomes a medium of expression. The essence of materials play an essential role of expressing built form with the nature of being for materials too are endowed with special characteristics that enhances the spirit of place with the architecture created.

Symbolic meaning of colour in Architecture

Colour symbolism is one of the most universal of all types of symbolism, and has been consciously used in the art, literature, cinema, photography and architecture. There are a great many considerations bearing upon the meaning of colour in architecture. Colour in a material expresses its qualitative aspects and origination.

Many primitive peoples intuitively sense a close link existing between colour and the different aspects of the real world. The Zuni Indians of Western America, make a yearly offering to their priests with corn of seven colours; each colour pertaining to a primitive god.

Warm, advancing colours such as red, orange, yellow and by extension white embraces the imagery of activity and intensity. Passive and retreating colours corresponding to the warm hues are the colours of blue, indigo, violet and by extension black. Green being an intermediate, transitional colour spanning the two groups. " The correspondence of the colours to the respective functions varies with different cultures and groups and even among individuals." 18

In general however blue, the colour of the rarefied atmosphere, of the clear sky, stands for thinking; yellow the colour of the far seeing sun, which appears bringing light out of an inscrutable darkness only to disappear again into the darkness for intuition. Red the colour of the pulsing blood and of fire, for the surging and tearing emotions. While green, the colour of earthly, tangible immediately perceptible growing things responds the functions of sensation.

Orange with fire and flame. Brown and ochre with the earth. Black with the fertile land. Gold is in corresponding to the mystic aspect of the sun, while Silver is to that of the moon.

Material offers architects with a palette of colours to choose from. Each colour along with its material symbolises an aspect relating to the way of life and the world. Colour is an important realm in the essence of materials for it conveys meanings and triggers associations and its effect on a person's psychology is immense.

In concluding this chapter, the forms and spaces of architecture are the creation of materials. The essence of a material contributes in expressing architecture by enhancing the spirit of place. This chapter explored the avenues of relationship that are visible between architecture, spirit of place and the essence of materials. These when combined creates a sensual experience that draws on a deeper level of our understanding through the use of symbols, colours, connotations and associations.

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List of Illustrations

CHAPTER 02

CHAPTER 02

The concepts and methods of using materials in Architecture.

Chapter 01 discussed the essence of a material contributing in expressing architecture by enhancing the spirit of place. It discussed the relationship between architecture, spirit of place and the essence of materials. The relationship between materials and architecture dates back to the origin of human evolution. Chapter 02 aims to trace in detail the concepts of using materials in architecture from the ancient civilizations to the contemporary times.

Introduction

The manner in which materials have been used from the earliest days of man up to today has evolved and changed with time, society, human development and circumstances. Comprehension of the manner in which materials have been used in various built form and how all these methods contribute to expressing architecture and the society of the time is a necessary tool in understanding built form and civilization. The methods of using materials should be studied in order to understand what the building is about, its concepts and its very character.

Concepts of materials in the Ancient Worlds

The play of materials is a continuing process and this process represents the mental and social development of human beings. Structural devices and the materials used in buildings were an opportunity for expression in the earliest civilizations. Two main concepts can be identified from ancient civilizations.

Concepts of using material in the Western Civilization

The monumental Architecture expressed domination and power in the Western, Egyptian, Incan and Mayan Civilizations. From the first major Egyptian monuments of mud and brick tombs known as *mastabas* for royalty and nobles, to the development of stone mastabas which translated the techniques previously used for buildings in wood and mud-brick. The geometrical forms of the pyramids and tombs were derived from the worship of the sun god Raa, whose dominant presence was expressed explicitly in Egyptian lives. They believed in one god superior to all and his power and dominance was known to be immortal as depicted in the Pyramids. Concept of building and using materials was to express immortality and power. Monumental architecture reflects the power structure of the era of Pharaoh and slaves. It was Egypt through her religion and hieroglyphics that gave shape to "Man's awareness of the material and spiritual, natural and cultural duality of the world." 1

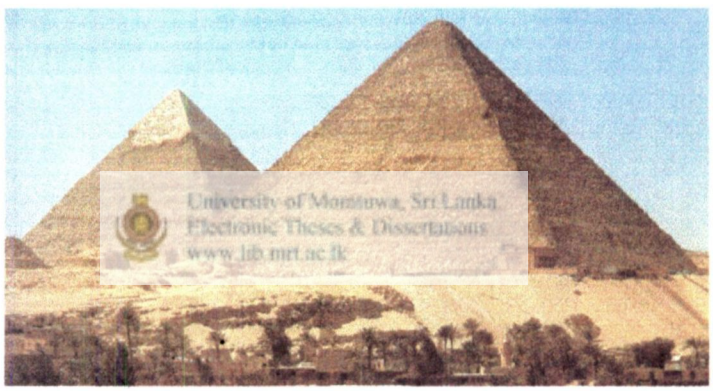


Figure 03

(Source: Gombrich, E.H-1992: "The Story of Art". Page 32)

The Greek column became an expression of refinement. It is narrow at the summit than at its base and is diminished by a curve beginning slightly mid point giving it an effect almost muscular power to resist load. (Encyclopedia Britannica, Inc. 1987.) The Romans exploited the arch and the vault and it enabled for greater spanning distances. This exemplified the advancement technology of their culture. The use of columns, arches and vaults of in Roman aqueducts was daring and beautiful. The great Romanesque cathedrals with the use of columns, arches and vaults led to soaring naves. The column and vault merged in celebration of structural audacity and technical skill in the Gothic period. God was glorified with a structural miracle in the Gothic period. The heavy ground based characteristic of stone was transformed

into apparent weightlessness. The religious meaning was conveyed through the use of material and technological skill. The Gothic vaults show the quality of fibers of a tree, branching out by the use of stone. The material helped in transforming the idea into built matter.

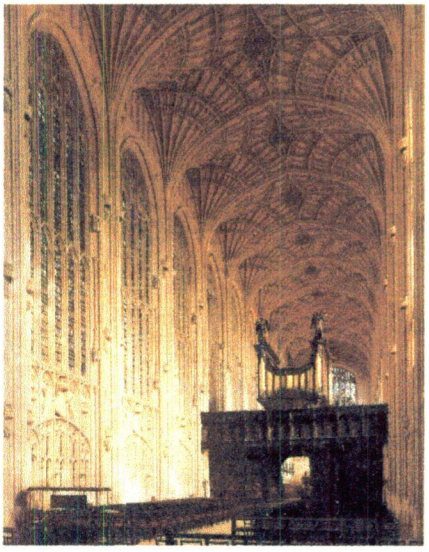


Figure 04

(Source: Gombrich, E.H-1992: "The Story of Art". Page 203)

Concepts of using material in the Eastern Civilizations

The Eastern civilization was spread and animated by two great and enduring world religions Hinduism and Buddhism. The agrarian based civilizations were based on religious philosophies. "A true Hindu would not heedlessly injure the slightest object that has no life. A tree is as much a manifestation of Divine Wisdom and Power as the man himself...Therefore a Hindu in plucking a flower or cutting a twig prays to the Supreme, and asks permission of the industrious ones who have made it." 2

The Hindu belief of gods living in mountains and caves a belief that prompted when they came to build a temporary dwelling- place for a god on earth which is known as a mound and womb architecture. Indian rocks cut temples are a literal expression of the mountain cave symbols states J.C Circlot. He says the temple is the cave cut into the side of the mountain. The cave stands for the spiritual center, the heart or the hearth. At Ajantha and Ellora the finely carved sculptures, votive structures and great rock cut halls, chambers are marvels that were created.

The caves of Ajantha are strung out along the sheer rock face of a cliff. The devotion and inspiration that created these extraordinary works of art is a marvel drawing pilgrims from all over the world.

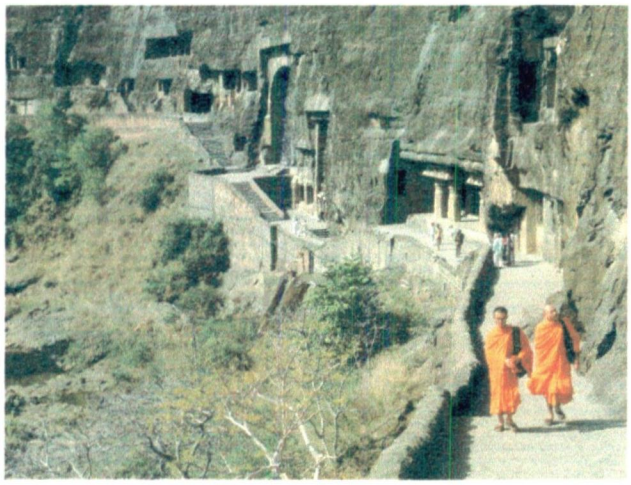


Figure 05

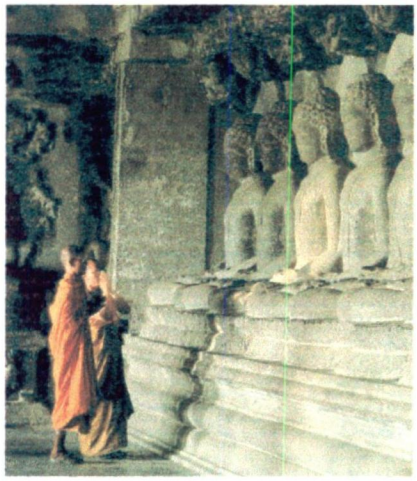


Figure 06

(Source: Haesner, Chhaya. " India: Land of the Buddha". 1988, Page 113,22)

The most profound and fundamental architectural symbol is the "mountain temple". The Babylonian Ziggurat, the Egyptian Pyramid, the American Teocall or stepped pyramid and the Buddhist Stupa are mountain temples. It was based on a complex geometrical symbolism including the pyramid and the ladder or staircase as well as the mountain itself.

The Stupa was the earliest distinctly Buddhist structure. It was developed from the mounds of earth and stones that were built over the remains of the Lord Buddha. " In fact the word Stupa is derived from a Sanskrit root, *stup*, which means 'to heap.'" 3 The transformation of a simple funerary mound to and ornamental structure and an object of veneration occurred in the century following the death of Lord Buddha. The oldest of these dates to the period when Sanchi was built during the reign of Emporor Ashoka in 3rd century BC.

Figure 07

(Source: Haesner, Chhaya. " India: Land of the Buddha". 1988, Page 115)

It is clear that "The history of architecture is also the history of material invention. Discovery of new material, or new ways of working or combining existing ones, has earmarked hinge points in architecture's evolution, suggesting new possibilities and the generation of new form." 4

Approaches to using materials in Architecture in the contemporary world.

Approaches to using materials are varied in the contemporary world of architecture. It is these approaches that create individuality. Two distinct approaches to using materials that characterise almost all the architecture we see in the modern world can be identified.

The first approach is when materials define conceptual imagery generated at the preliminary design stage, even when the design is tender. This approach to materials is to relate to the soul of the material, the essence of the material. Materials are used to consolidate the ideas that the generator establishes. "Every building is born in the mind of its creator...reflects how the

elusive qualities of human consciousness are poured into stone and brick spirit transforms matter into places of dwelling." 5

The distinct approach of using materials as an after thought once the design process is over is unlike the architecture that grows and opens up. The process of closing down from concept to detail is not adhered to. Instead materials are used superficially merely as a decoration, cover up or mainly to jazz up a building.

Between these two extremes of approaches there lies a multitude of attitudes to using materials. The various attitudes that range within the scope of using materials in conceptual design may be attributed to a bigger cause. The psychological tie that bound man with the artifact changed irreversibly with the industrial revolution, when transportation developed to such an extent that " materials that had been common in one part of the country could be transported to another as whims of production and economics dictated." 6 The invention of modern materials and the creation of new techniques brought about a new era in architecture "the roughness or smoothness of concrete, the wonderful transparency of big sheets of glass, the spidery strength of steel structures, all authentically extended our sensuous experience of building." 7

The fact that architects have been marginalised when it comes to designing as well as in the overall project has an effect on the methods of using materials. Today urban controls, economy and structure mainly dictate form. Outsiders very often do the interior and the majority of the cost is spent on the services of the building. This leaves the architect the relatively cheaper element of the building that being the skin "in which quite dramatic differences of appearance can be achieved quite cheaply - hence the rise of Post Modernism in the '70's and '80's, in which the work of architects is literally marginalized and buildings become little more than signifiers of the power of the owner." 8 Architecture therefore has acquired a notion of being skin deep. (Davy, Peter 1997)

Architecture being skin deep has resulted in two major reactions. One of these has been described as Deconstruction "in which traditional norms of place and space are subverted partly

in attempt to build an embodiment of the philosophical doctrine of deconstruction which criticise the proposal that are simple and guaranteed meanings to any cultural meanings." 9

Another reaction to Deconstruction is the "tectonic sensibility". This is an approach to using materials in which the sensibility shown towards materials is becoming more important, for, more attention is being paid to material qualities in a building. The material qualities of buildings are of immense importance: they relate to the basic perceptions and the relationship to nature. (Davy, Peter.1997) The tectonic sensibility very often tries to create, to be innovative while understanding the past.(Frampton, Kenneth. 1997)

The tendency to use the nature of materials in a way of replicating traditional buildings so accurately, that the identification between the old and the new is impossible. This approach to using materials is known as the emergence of Simulacrum . " ...With modern building materials it is possible to replicate ancient buildings with such exactitude that authenticity or origins can be put to doubt." 10

When considering the concepts of using materials in the ancient and contemporary civilisations two distinct approaches celebrate the essence of materials. During the ancient times materials were venerated for it was believed that spirits resided in the material being. Today architects celebrate the materials for what it is and for its essential traits, which is termed as being "honest to a material."

Materials as an object of veneration

The veneration of materials originated many civilizations ago and reverence of a place and the spirit embodied in a building has been handed down to us from many generations back. By relating to the soul of the material and by honest application the true character of a material was celebrated.

In the beginning of mankind ancient builders believed that rocks and stones and trees had souls. "Ancient builders worked building materials carefully. They begged the stone's

forgiveness when they removed him from the ground and asked the tree's pardon for thinning her branches... " 11 Corner stones were laid in ceremony, thresholds blessed and the spirit of the building, which testifies for the material spirit was revered. Once upon a time, the materials from which a building was made came virtually from the site itself: stone was cut from the local quarries and timber from neighbouring forests; bricks and tiles were baked in clay from nearby pits. There was a strong link between the artifact and the earth from which it grew that was not just economic, but deeply satisfying at a psychic level as too. (Davey, Peter-1997)

Bhadda Sala Jataka relates the story of King Brahmadatta who wanted to build a palace supported by a single column. He summoned his craftsmen to find a tree worthy of accomplishing such a task. They found a lordly Sal tree which was worshipped by the villagers the town folk as well as the royal family. By adorning the tree with scented garlands and lighting lamps and honouring the tree they bespoke of the King's wishes. On hearing this proclamation the tree Deva greatly disturbed appeared in a vision one night to the king's sleeping chamber. The Deva asked the king if he must cut the tree to cut it in the sequence of limb by limb, branch by branch, first the top, then the middle and finally to uproot. The king stated that this was indeed a grievous way of destruction to which the Deva replied, "my kith and kin have grown up around me, and beneath my shade, I should crush them if I fell entire upon them, and very great would be their sorrow." 12 On hearing this moving story the king spared the life of the noble tree and gave generous gifts and alms till his dying day.

Ananda Coomaraswamy writes about tree worship and the Hindu feeling of sympathy for everything that has life "It has everywhere been held that, apart from the little organized life of the tree itself, trees and forests are the abode of nature spirits (nymphs, dryads, devas, nats, etc) approximating to, but scarcely reaching the human plane of evolution." 13

To build in response to basic needs, adopting elemental materials into structural units is to concentrate the mind, the body and the skill to a problem solving exercise consciously aware of the greater being of things. "The structure of the building can be calculated and the strength of

the building materials tested, but the spirit of the building is sensed as the ancients sensed spirits in rocks and trees." 14

Honesty to materials

The concept of veneration of materials held in belief, that materials were endowed with spiritual powers. The material was handled with respect. When the true nature of material or the essence of a material is being respected it can be termed as the honest application of the material to the corresponding form.

The works of Frank Lloyd Wright during the 20th century also defines honesty to materials. "I began to study the nature of materials, learning how to see them. I learned to see brick as brick, to see wood as wood and to see concrete, glass or metal... as I could now see, there could be no organic architecture where the nature of materials was ignored or misunderstood."15

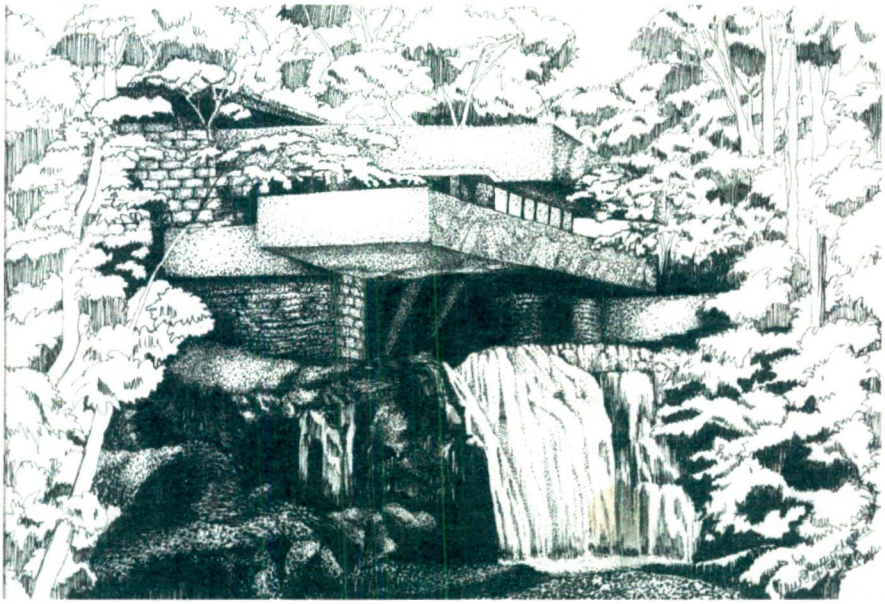


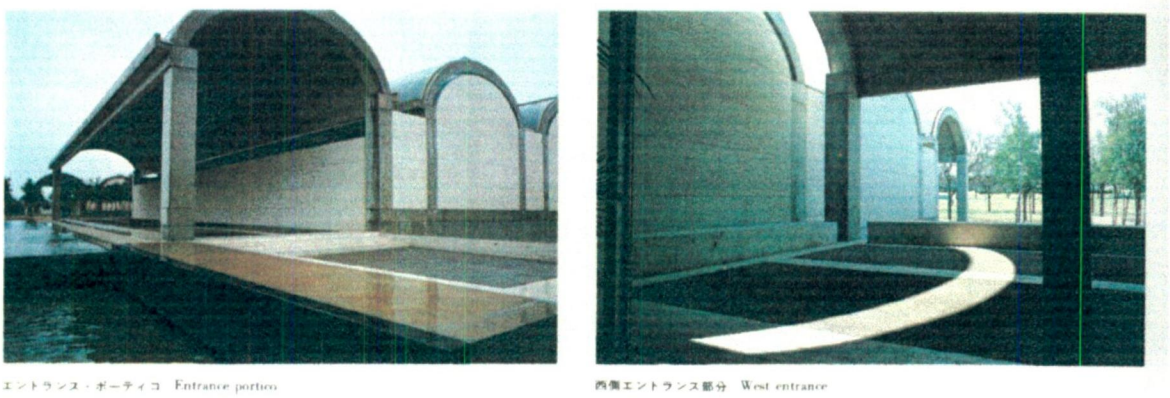
Figure 08

Falling water at Bear Run, Pennsylvania was built in 1936. The integration of the house and the spirit of place was a design exercise. Poised on a steeply wooded site, its solid core is rooted in

the upper part of the slope to counterbalance the terraces cantilevered out over the waterfall below. Just before world war II (Frank Lloyd Wright) was producing noteworthy architecture in America considering America's industrial and technological progress and changes that were already taking place in Europe. The use of natural materials was somewhat influenced by Japanese concepts.

Concurrently Louis Khan, was called upon in 1962 to design the Indian Institute of Management, Ahamedabad Campus. He utilized traditional building materials and stretched their limits to the extremes. Louis Khan did recognize this and made the bricks to span sometimes larger openings. "As if talking to bricks he mentioned -'I asked the bricks how you want to serve this space and the bricks said let us become an arch.' This sense of making the materials excel themselves is not possible, if one has no respect for things around, even though they be inanimate." 16

Kimbel Art Museum, Fort Worth, Texas from 1966 to 1972 by Khan was done using a limited number of materials such as concrete, marble, lead and wood. He created a refined human environment and the Kimbel Art Museum is an integrated architectural statement.



エントランス・ポーティコ Entrance portion　　西側エントランス部分 West entrance

Figure 09

(Source: "Louis I. Khan." Architecture and Urbanism. 1974. Page 58)

" 'Khan's love (almost obsessive) for
Concrete as concrete
Wood as wood
Stone as stone
And
Brick as brick
Takes him closest to the elemental building craft.' -Obituary of a poetic genius." 17

The use of materials for its essence resulted very much as part of the original conception of a design. Materials consolidated generations of architecture, and this honesty to the soul of the materials is an immemorial approach to materiality.

The psychological tie that bound man with the artefact changed irreversibly with the industrial revolution, when transportation developed to such an extent that " materials that had been common in one part of the country could be transported to another as whims of production and economics dictated." 18

The invention of modern material and the creation of new techniques brought about a new era in architecture "the roughness or smoothness of concrete, the wonderful transparency of big sheets of glass, the spidery strength of steel structures, all authentically extended our sensuous experience of building." 19

Materials, which were heavily used after the industrial revolution, express the way of life during that specific period. "The tensile qualities of steel have enabled architects and engineers to provide often dramatic structural statements in which Ruskin's 'elastic tension' is clearly evident. Tubular steel used in space frames or as support struts has given architects considerable flexibility in articulating the 'skin' of the building. The external expression of structure induces a sense of dynamism and vitality widely accepted as characteristics of twentieth century life." 20

The advent of modern materials and techniques have an authenticity: the roughness or smoothness of concrete, the wonderful transparency of big sheets of glass, the spidery strength of steel structures, all authentically extended our sensuous experience of building. Concrete was a material mastered by some of the most recognised architects of the Modern movement. Charles Correa states in 1955 after he saw Le Corbusier's Jaoul House in Paris "I was absolutely knocked out. It was a whole new world way beyond anything being taught in America at that time. Then I saw Chandigarh and his buildings in Ahamedabad. They seemed to be the only way to build. When you got back to your own office you wanted to make everything out of exposed concrete." 21

This chapter analysed in detail the architectural forms that developed as man learned to master more complex building techniques. All these techniques form part of man's progressive development in a series of steps. The cave giving way to the hut which turned out to be explored in various shape and form as with the passage of time. These forms are derived from the materials used and the building techniques available. The aim of the Chapter is to contribute to the theme of the use of essence of materials along with the concepts and methods of using materials in architecture. The essence of materials was further explored by two concepts both ancient and modern. By strengthening the knowledge of the essence of materials and its origin the 03rd chapter examines each materials essential quality in depth.

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List of Illustrations.

CHAPTER 03

CHAPTER 03

Essence of materials.

Introduction: Essence of Material

Historically structured by technical advances and inventions the material relationship with architecture is complex. Besides the technical qualities and its physical capacities material draws our responses in a deep-rooted manner. Materials are endowed with their own essence, which can evoke feelings, trigger connotations and symbols. This chapter consolidates the essence of each building material, its associations and symbolic imagery that helps to enhance the spirit of place and thereby contribute to a sensory and symbolic architectural experience.

Essence of Stone

The language of stone as a material and a surface speaks of distant geological origins its durability and inherent symbolism of permanence. The extensive use of stone in various periods has increased the sense of monumentality in civic buildings and as a natural material stone also blends well into the landscape. Stone is a symbol of being, of cohesion and harmonious reconciliation with self. The hardness and durability of stone have always impressed men, suggesting to them the antithesis to biological things subject to the laws of change, decay and death, as well as the antithesis to dust, sand and stone splinters as aspects of this integration. " The stone when whole symbolised unity and strength when shattered it signified dismemberment, psychic disintegration, infirmity, death and annihilation"1

The Chinese attribute to the rock a symbolism denoting permanence, solidity and integrity. Like the stone it is held in many traditions to be the dwelling-place of a god. As a Caucasian tradition the world was covered in water in the beginning. The great Creator-God then dwelt inside a rock. It seems then that man intuitively regards stones and rocks as the source of human life. A

mystic significance is attributed to this mineral, arising from the sound it makes when struck and because of its unity- its solidity and cohesion.

Essence of Wood

"Wood speaks of its twin existence and time scales; its first as a growing tree and the second as a human artefact made by the caring hand of a carpenter or a cabinet maker." 2

The tree is one of the most essential of traditional symbols. Mythological associations between gods and trees are extremely frequent: Jupiter and the Oak tree, Apollo and Laurel, Saturn with Pine. In its most general sense, the symbolism of the tree denotes the life of the cosmos: Its growth, proliferation, generative and regenerative processes. It stands for inexhaustible life, and is therefore equivalent to a symbol of immortality. The tree with its roots underground and its branches rising to the sky symbolises an upward trend.

As Juhani Pallasma has remarked "the tree... is also one of mankind's most common and meaningful symbols – the Cosmic Tree, Tree of Life, the Tree of Fertility. At the same time having this mythic wood is an approachable material which can be manipulated." 3

It is intrinsically warm, pliable, soft, organic and full of natural marks such as knots and grain. It is difficult to think of a material that has been the object of as much design experimentation as wood, yet its character has somehow always remained intact. Through the centuries, wood has continued to be a point of reference, a synthesis of what nature can teach mankind about design.

Wood technology experienced a revolution in the 1960s with the enormous influx of particleboard panels, in which wood was ground and recomposed into a more homogenous and isotopic material. Today the research on moldable compounds is livelier than ever, spurred on by economic necessity and by concern for the world's limited resources.

The technology of lamination, older and more developed than that of mouldable compounds, has led to numerous innovations. With technological advancement, the appearance of wood is

safeguarded as a precious asset, reinforcing the link between high-tech humans and the earth that has nurtured them.

Essence of Metal

The use of metal is as old as human civilisation. Our ancestors knew of just seven metals; gold, silver, iron, copper, tin, lead and mercury. Historically metals occupy the mysterious realm of alchemy with its mixtures and secret formulations. In astrology metals are called " terrestrial" or " subterranean planets" because of analogous correspondences between the planets and the metals. This correspondences is inferior to superior: Saturn with lead, Jupiter with tin, mars with iron, Venus with copper, Mercury with mercury, moon with silver and sun with gold.

Jung has asserted that the base metals are the desires and the lusts of the flesh. Extracting the quintessence from these metals or transmuting them into higher metals is equivalent to setting creative energy free.

The ancients experimented with alloys, mixing copper and tin to produce a new metal bronze with a lower melting temperature and improved casting properties. The Romans were the first to use metal as a major building material. The Pantheon had a bronze roof, parts of which survived until the middle of this century. Haggias Sophia originally had a lead roof that lasted 1400 years.

Because of their malleability and relative ease of working, copper and lead became synonymous with complexities of gothic architecture. Endowed with the rich green patina of age, weathered copper spires and roofs still enliven the skylines of northern European cities.
With the industrial revolution resulting in increased industrial efficiency drove down production costs, interest in developing new and more widely available materials was aroused. The first iron bridge at Coalbrookdale, England was built at an exorbitant cost, but proved the harbinger of iron as a cheap universal building material.

At the beginning of the century, aluminium was extracted by chemical means and was more costly to produce than gold. The discovery of coke based smelting for iron; electrolytic extraction for aluminium reduced the cost of producing such materials to acceptable levels.

The evolution of iron and steel frames made it possible to build upwards; steel framed skyscrapers determined the heroic scale of American cities. " Tubular steel used in space frames or as support struts has given architects considerable flexibility in articulating the skin of the building. The external expression of structure induced a sense of dynamism and widely accepted as characteristics of twentieth century life" 4

The development of stainless steel at the turn of the century provided an environmentally stable metal that could sustain a polished lustrous appearance. The Chrysler building in New York was one of the first buildings to use stainless steel externally, on its sleek hypodermic pinnacle roof. After the war, the transfer of technology from military and aeronautical industries generated new metal forms. Mies Van Der Rohe's reductionist structures composed of steel channels, angles, I beams and H columns were tautly elegant expressions or a new minimalist aesthetic.

Unlike other building materials, metals yield to the entropic nature of the environment, but can be recovered and reformed. This capacity for recycling gives them some tentative credentials to sustainability.

The traditional metal technologies such as hot rolling, extrusion and die and sand casting when compared to plastics, ceramics and glass appear to have undergone little change in recent years. Developed advanced technologies such as super plastics steel and aluminium alloys can be stretched to ten times their original length, the traditional characteristic of metal can be mutated. Titanium has become a particularly popular metal because of its lightness, elasticity and easy machinability has found new applications including computer-shielding plates and extruded profiles. Although the status of metal has been threatened by ceramic in engine parts

and cutting blades, composites in vessels from aircrafts to boats and plastics in smaller structures like chairs their mutable character guarantees their continued presence.

Alchemy.

The real beginnings of alchemy date back to the first century A.D. when it was practised mainly by Greeks and Arabs. Elements from various traditions, including Christian mysticism, were later incorporated. It was essentially a symbolic process involving the endeavour to make gold, regarded as the symbol of illumination and salvation. Different colours signified the four stages as follows.

- Black (guilt, origin, latent forces) for 'prime matter' (symbol of the soul in its original condition)
- White (minor work, first transmutation, quicksilver)
- Red (sulphur, passion)
- And finally gold

In Hindu doctrine, gold is the 'mineral light'. Gold is the image of solar light and hence of the divine intelligence.

The Essence of Brick

Brick makes one think of earth and fire, gravity and ageless traditions of construction.
The popularity of earth as a subject and medium of expression in Architecture is due to the recognition of its sensuality and essence. The essence of brick draws imagery of Mother Earth and the primordial images of intimacy and belonging.
Building with earth is of countless customs and of discoveries of humanity down through the ages. Through the ages in all countries, diverse cultures, social and constructive habits humans have used this material of Mother Earth to create their living space. The adaptation of architectural and construction methods according to the behavior and properties of the earth resulted in the transformation of earth material into built form. The tradition attempts to be in

harmony and in balance with nature, the landscape and the surrounding environment. This ageless method of constructions relates to the social values of building traditions. Being an environmentally sound material it integrates human and local values and the climate and surrounding.

Brick gives a more human scale to buildings and because of its cheapness and ease of manufacture brick has been used since Babylonian times for both domestic and public buildings.

The Essence of Glass

Glass has become an important symbol of the 20th century, matching the use of stone in previous civilizations. With the use of steel walls was non-load bearing, which resulted in walls being thin skins of glass. The permeability of vision was enhanced. Glass became a transparent, translucent and even an opaque building material. Glass and steel advocated Mies Van Der Rohe's "Less is more" concept and brought about a revolution in the history of architecture.

By its nature, glass, which is completely non crystalline, has always invited hybridisation. Transparent and invisible, glass can curve and colour space and refract, filter and shape light. Through the centuries this material made from mixed sands treated to achieve a state of rigid liquidity has been the magical obsession of alchemists, chemists and engineers and have developed extraordinary mutant qualities.
Through experimentation with additives modern engineers have perfected photo chromic glass, which changes colour on exposure to light.

New materials

New technologies are being used to customize extend and modify the physical properties of materials and to invent new ones endowed with the power of change. Plastics can be less transparent as glass, as flexible as the fiber, and wood can be soft as upholstery. Solid materials are being replaced by ceramics and sheet material by carbon and glass fibers. No longer adjuncts in passive roles, materials have been transformed into active interpreters of the designers.

The essence of new materials is as expressive as it is functional. They also have generated new forms. Lent an experimental approach toward design and each possesses a logical beauty. Collectively they portray an aesthetic centered on economy and continuing research.

The Essence of Plastics

Plastics was initially developed in the 19th century and exploited in the first half of the twentieth century to imitate natural materials. Plastics exploded in a burst of emancipation in the late 1950s, with a possession of flashy exuberant materials. In the 1960s the plastic object became a political symbol serially produced, uniformly inexpensive, and available to all social classes equally.

With the refinement of existing technologies blow moulding extrusion and inject moulding plastics can now assume virtually any shape and have infinite applications in the designs of the objects. Today plastics are sturdy, resistant and beautiful. They can take many shapes, from the most articulated. Plastics can be made to resemble translucent and transparent glass, they can be moulded to match the organic shapes of parts of our body, they can be treated to look like folded, articulated plans, and they can be detailed into small complex objects like a computer mouse.

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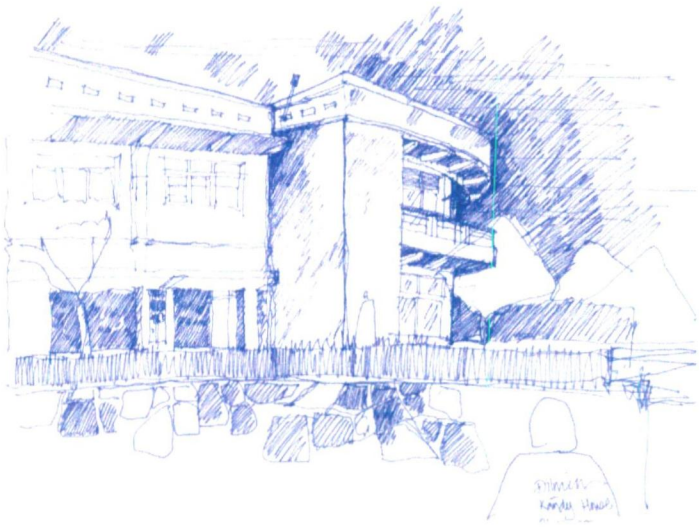
CHAPTER 04



Case Study : 01-Kandy House by Andrew Boyd.
68/6 Rajapihilla Mawatha, Kandy. 1942

CHAPTER 04

An Examination of the application of materials as a method of expression of architecture.

Previous chapters underlined the material relationship with architecture. It explored the way our responses are evoked by the materials that are endowed with their own essence. The essence of materials can evoke feelings, trigger connotations and symbols. This chapter with the use of case studies consolidates the essence of material, its associations and symbolic imagery that helps to enhance the spirit of place and thereby contribute to a sensory and symbolic architectural experience.

Case Study : 01-Kandy House by Andrew Boyd.
68/6 Rajapihilla Mawatha, Kandy. 1942

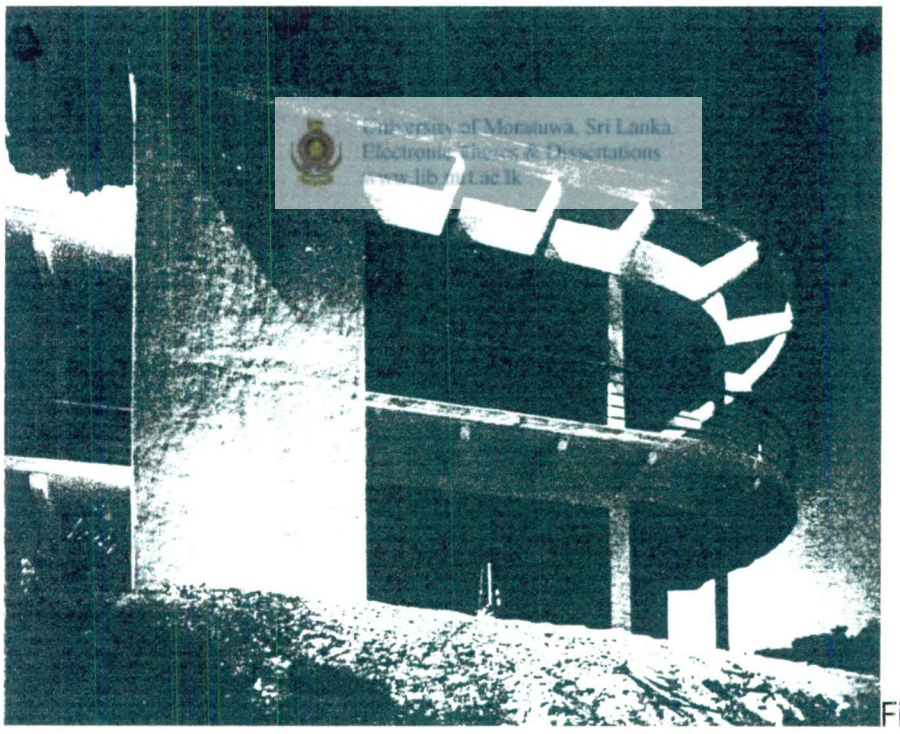


Figure 10

(Source: Hollamby Ted – "Andrew Boyd – His life and work". 1962)

Setting.

Overlooking the historic temple of the tooth relic, the Kandy Lake and town the house is built on Hilpankandura mount. A tea estate flourished above the house, and the area was formally known as the Roseneith Estate. Now famous as Wakarawatte or Walkers estate the tea estate is overgrown into a forest. Wakarawatte is the eastern extension of Hantana range.

The Kandy House is the last frontier against the wilderness of the then Roseneith Estate. Perched on the mount it overlooks the Kandy Lake and dominates the green clad mountain. A lone road leads to the house passing a majestic gateway heralding the first indication of domestication. The road terminates where the forest starts. The setting is of a final human stronghold before the mountain disappears and is subjugated by thick foliage. The road gives glimpses and vistas of the town as it winds itself up the mountain.

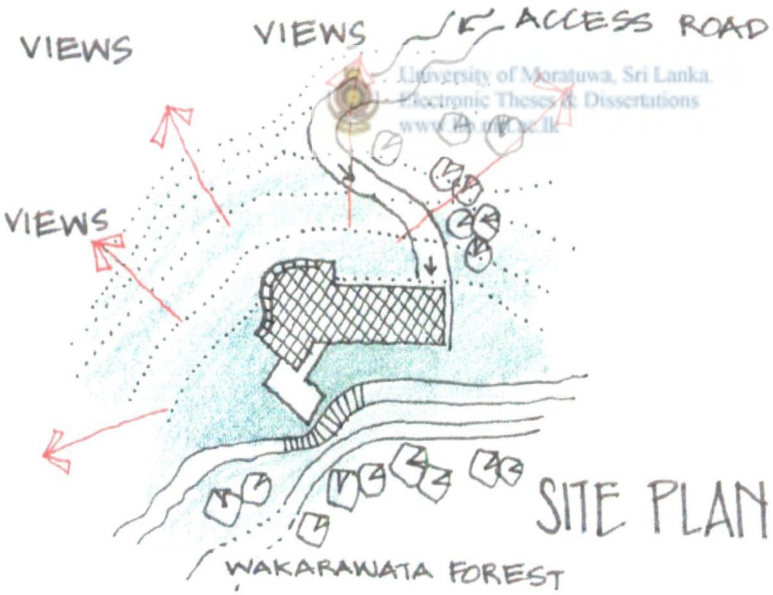


Figure 11

1800 ft above the sea level this magnificent site overlooks the historic lake in the center of the Kandy city. " Minette de Silva remembers that everyone used to refer to Andrew Boyd's house in Kandy as 'the ship'" 1

The Architect

Andrew Boyd's father was a judge in India and Andrew himself at first set out to be a tea taster. After some years of his apprenticeship in the mysteries of the art, however he decided to train to be an architect and left for England to study at the Northern Polytechnic school of Architecture. His friends, photographer Lionel Wendt and painter George Keyt encouraged Andrew Boyd to become an Architect. In the years of his practice he studied peasant-building traditions of the country, which he felt to have an affinity with the aesthetic of modern architecture itself through the "differentiating, simplifying and emphasizing" of the component parts of the structure and functions of these village houses and shops.

Design Response.

Andrew Boyd's first house in then Ceylon was built on the grounds of a large house in Colpetty. His fourth house was the Kandy house. The accommodation required for the Kandy house was living quarters for a small family, and separately from this, a studio and a bedroom. The central lining core with its striking curved terraces has the studio flat at the lower level and the family living room above. To the northwest extends the bedroom wing with its terrace sheltering the covered way from the garage to the front door below. The kitchen wing extends to the east.

The design evolves around a series of experiencing vistas. Small glimpses tease the traveller on his upward journey along the winding road. The traveller who copes with the dangerous bends is rewarded by sudden vistas of the city, the lake and the mountains across. The main staircase leads the visitor to the living room and the vista broadens. The terrace overlooks Kandy from east to west as far as the eye can reach. Kandy is suddenly perceived as a city held within a mountain basin from the terrace.

The main requirements of shade and air-movements are achieved by broadly screened verandahs with projecting louvered screens for cross ventilations.

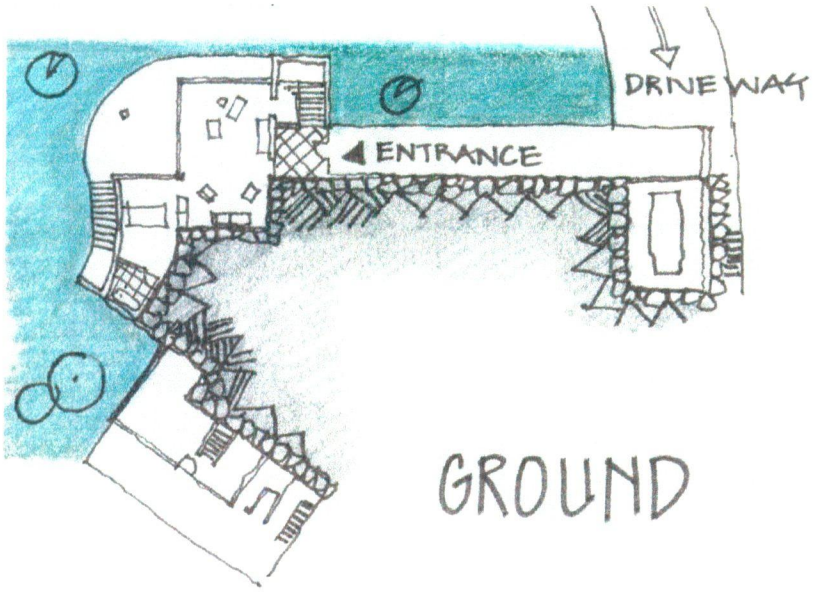


Figure 12

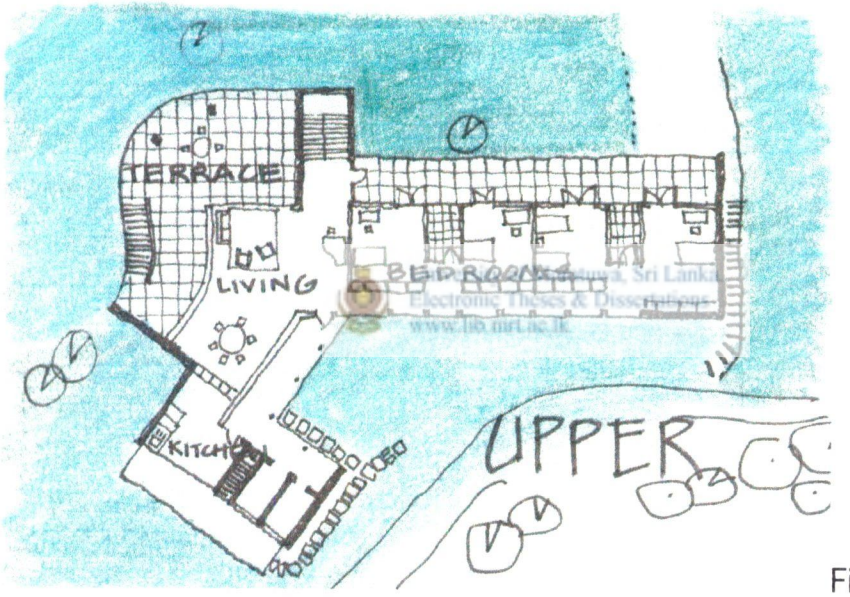


Figure 13

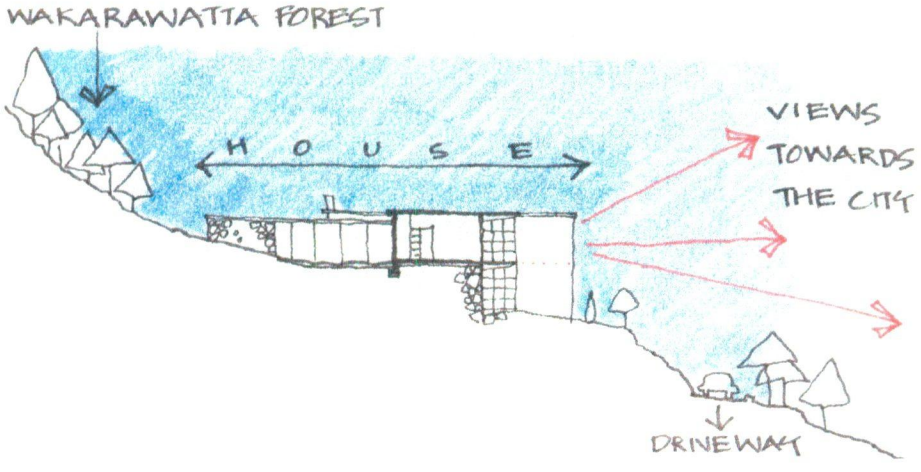


Figure 14

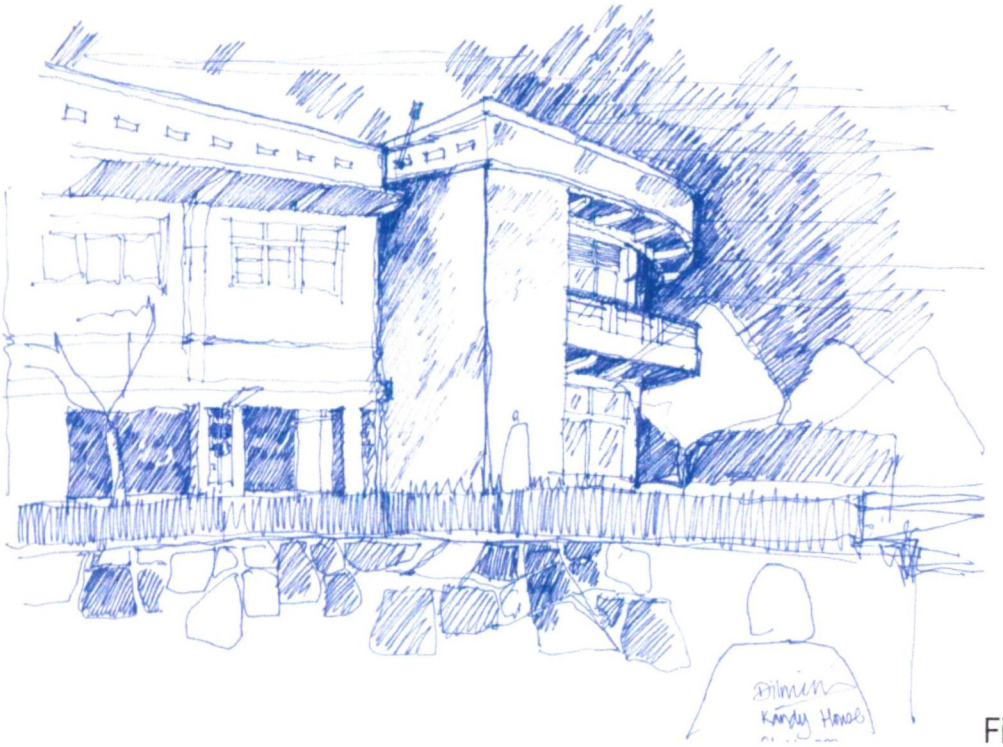


Figure 15

Landscape.

"In point of fact, man never chooses a site, he simply 'discovers' it" 3

As it was Andrew Boyd discovered the site for Kandy House on the mountainside of Hilpankadura. The essence of a landscape always revolves around a predominant element. The predominant element binds all secondary elements of the site together. The Hilpankadura mount touches the sky and cloud, and clearly maintains supremacy. The mountain, which starts from bedrock, rises towards the sky. Symbolizing an upward trend it relates to the tree and ladder that stands for the relationship between the underworld, the middle world and upper world. The mount Hilpankadura with its forest cover separates itself from the surrounding using the elevation. It presides over the Kandy town and faces the Temple of the Tooth Relic. A white terrace faces the religious complex. The sounds, lights and colours of cultural and religious pageants could be experienced from the main terrace.

Figure 16

The majesticity of its perch and the spirit of the surrounding forest clad mount convey the image of a castle. " The castle is located on top of a mountain or a hill, which suggests additional and important meaning derived from the symbolism of level. Its shape form and colour its dark and light shades, all play an important part in the defining the symbolic meaning of the castle as a whole, which, in the broader sense, is an embattled spiritual power ever on the watch" 4.

Likewise the Kandy house on its strategic base of Hilpankadura is ever on watch. Since 1942 the Kandy house has lived through the era of independence, seen the changes in governance, development and daily life of the town, the fires of insurgencies.

Figure 17

Figure 18

Essence of Materials.

The natural living backdrop of the site is Wakarawatte forest. The trees that surround the house and clad the Hilpankadura peak speaks of the upward rise and the essence of life and nature. The sound, the green colours and movement of the forest create a perception of growing things that is earthly and tangible.

The Kandy house is well anchored to the ground with the use of local granite retaining walls. It is also used to curve and mould the garden. The physical demarcation of boundary is solid with the use of granite, which is in contrast to the boundless scenic beauty. The road bounded by the granite retaining walls binds the base of the Kandy House to the ground. Local granite is used in raw form. The intricate patterns using mortar forms the edges of granite touching one another. Its pure natural form connects the building with the mountain. It speaks of its origin and its permanence.

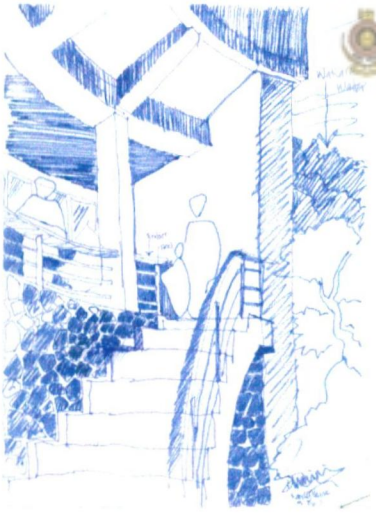


Figure 19

Figure 20

The retaining walls and the sidewalls of the kitchen block and the curved wall of the studio bedroom below are of local granite. They represent the material of the mountain and the ability of the house to blend into the mountainside. Otherwise structural walls are of brick and lime cement rendering and lime washed white.. The local granite has created a perch top for the building, which rises and dominates the green landscape.

The original white colour of the house, which is unchanged up to date, stands out vibrantly against the green hues of the Wakarawatte forest. There is great consideration bearing upon the meaning of colour in architecture. The white with its neutrality has an infinite possibility of styling and shaping a room. Corners and curves are better lit in white in direct sunlight. A white wall forms a physical barrier between hostile climate and the inhabitants inside.

Figure 21

The vertical rising of the trees in the forest are represented in the concrete columns that are placed in the terraces. The column rising from the base onto the floor slab and reaching out to the roof slab evokes the form of a tree. The branches and the tree canopy is almost visually felt with the column and roof slab. The steel within the column can be visualized to be the branches reaching out into the roof slab.

"Column- The single column pertains to the cosmic group of symbols representing the world axis such as the tree, the ladder, the sacrificial stake, the mast, the cross. It may have a merely endopathic sense, deriving from its vertical nature implying an upward impulse of self affirmation." 5

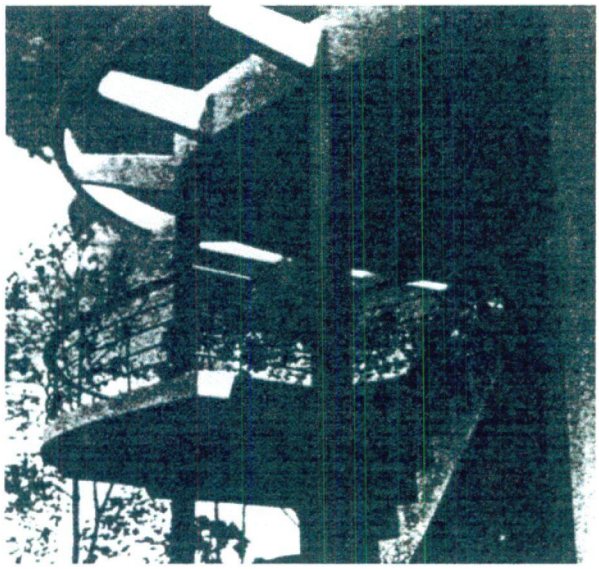


Figure 22

Figure 23

(Source: Hollamby Ted – "Andrew Boyd – His life and work". 1962)

The use of columns has enabled greater spans that create and enhance the vistas the site is blessed with. The open space internally creates the sensations of being raised above ground. The boundless scenery viewed from the perch of the mountainside leaves the sky as the limit.

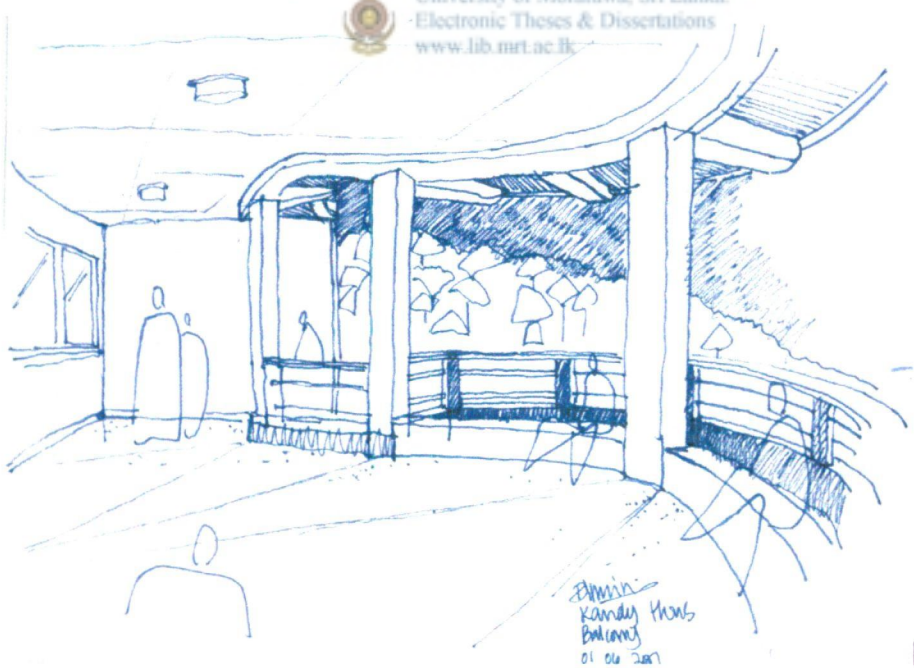


Figure 24

The windows are large and glazed and draw the viewer towards the terrace. The entire terrace length is glazed. The use of glass captures the essence of the site and to draws it in to the

building. The glass assumes the role of a natural skin. Its transparency curves and colours the shape refracts and filters and shapes the light and scenery.


Figure 25

The use of concrete with its crisp and clean lines is opposed by the transparency and fragile nature of the glass. The solid, flat lines of the concrete state its vibrancy, strength and mastery over the site. The concrete flat roof floats above the glazed windows of the terrace drawing a white, thick horizontal line in the green landscape, which is visible from the Kandy city.

White coloured Teak wood is converted into thin sections of sashes and frames that disappear into the building. French doors and trellis screens of teak are unique to the Kandy House. Trellised doorways reach up to the soffit creating permeable quality between spaces.

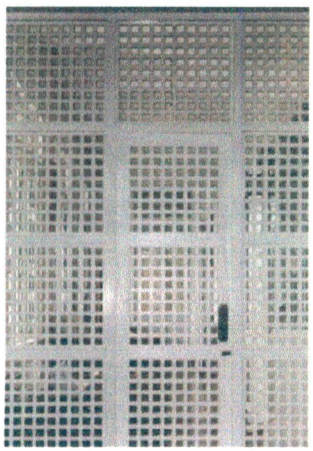


Figure 26

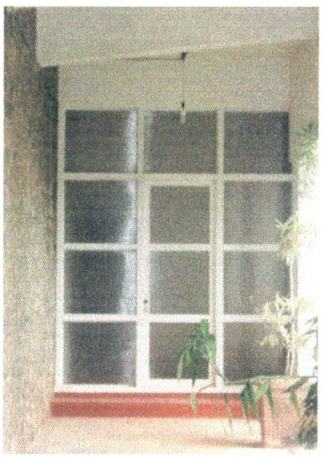


Figure 27

The use of timber as an interconnecting material has enhanced the natural quality and reaches out to the uncompromising and crisp lines of concrete. "Wood is intrinsically, warm, pliable, soft,

organic and full of natural marks such as knots and grains, so it is used domestically or where people come into close contact with the building" 6

Unity in architecture

The mount, the forest and blue sky, builds upon the spirit of the site of the Kandy house. Its quality of an observing white being, ever alert on its perch with the vibrancy of the forest behind has created a strong sense of place. The spirit has woven itself around the clear-cut lines of the white concrete structure firmly anchored to its base by the use of local granite. It has sprung from the site.

The high elevation creates a visual connection between the Temple of the Tooth Relic, the city of Kandy, the lake and the surrounding mountain ranges. These views have been absorbed into the design and built form.

. Figure 28

The modern movement in architecture influenced Andrew Boyd. The modern movement in the history of time is expressed in the way he has used materials to give form to his design concepts. The attitude of the modern movement with clean, crisp lines and using of materials such as concrete, glass has clearly influenced the design of the Kandy House. The verticality of

the columns, the permeability and transparency of the windows and the natural timber trelliswork incorporate the internal spaces with the site.

These materials and their essences have enhanced the spirit the place. It has enriched the way one experiences the site, scenery and surrounding. Suddenly architecture becomes a sensory experience. It can be touched, smelt and seen. The physicality of materials draws attention to the material essence. The essential traits and characteristics woven around the very being of the material draw connotations, symbols and deeper levels of our understanding. There is unity in architectural experience with the contribution of the essence of materials.

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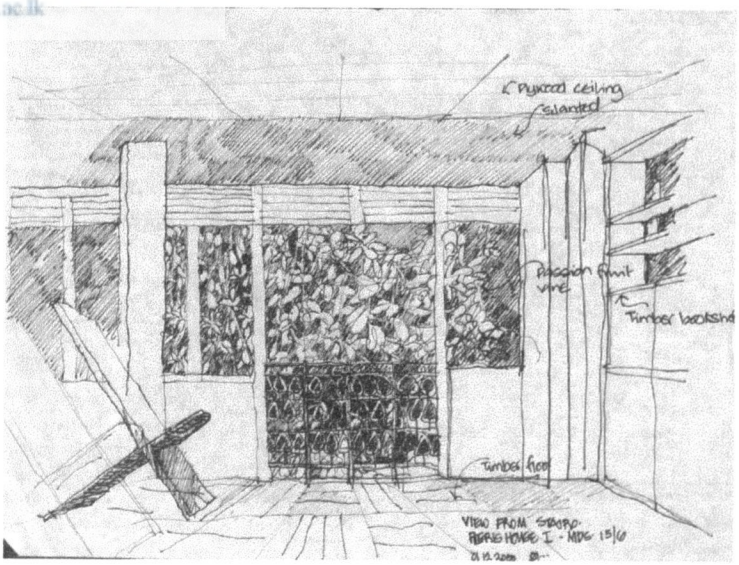
List of Illustrations



Case Study : 02- Pierris house I by Minette de Silva

15/6 Alfred House Gardens, Colombo 03. (1952-56)

Case Study : 02- Pieris house I by Minette de Silva

15/6 Alfred House Gardens, Colombo 03. (1952-56)

Setting

A twenty perch plot sandwiched between Galle road and Duplication road, accessed through Alfred House Gardens, is indeed an urbanized area today. When Ian Pierris discovered the site he wrote to Minette "I have brought a building block in Colombo... 60 perches, Alfred House Gardens". 1 From the limited description of the site, it could be understood that even in 1950's Alfred House Gardens was considered to be a prime plot in the city of Colombo. The dust, fumes and curious passersby were in abundance at the time of designing as well which called for the high walls enclosing the garden and house from these elements.

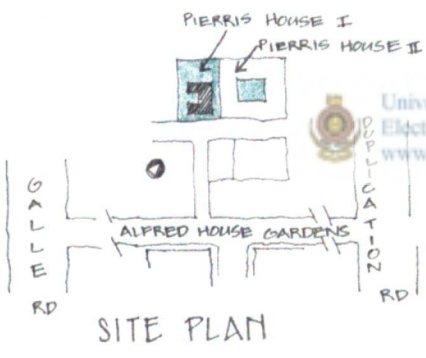


Figure 29 Figure 30

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 182)

Aligned by the access road, the neighboring houses, the Pierris house I along with its heir, Pierris house II overlooks Alfred House Gardens rapid urbanization with peace. Now facing the Paradise Road Gallery development as well as the multi storey housing development these sturdy sets of houses seem to have withstood time and aged elegantly. To see greenery amidst the buildings, glare, blaring traffic, hurried commuters is indeed pleasing to the eye. It gives coolness and a sense of being close to nature in what was once a green era of Colombo city.

When Minette started to design the Pieris House the surrounding of the site was congested. The time period was after the world war and post independence. She sums up the social background and spirit of the site when she asks " How to create in a congested town like Colombo the comfortable atmosphere of a spacious pre-war house" 2

Spirit of Place

The essential nature of the site was one, which had many layers of social implications, which have left their mark on the flat terrain. The very existence of Colombo, soon after independence depended on how well it arose from years of colonial rule. The development of Colombo and Sri Lanka had to define its pathway to liberalization. Any building site had to express the status of the country and its people. The aim of the generation of that era instilled upon the land such traits and characteristics. Ulrik Plesner poignantly described the post independence situation that was prevailing in the country at the time Pierris house came in to being. "Architecturally, the country suffered from post colonial self denigration. Good things came from England and some people enthusiastically believed in things like ' American style' and vynle floors... Most new buildings were a reflection of western ways, climatically unsuitable and visually indifferent".3

The Sri Lankan building tradition and crafts, which he termed excellent went unnoticed, unmourned and was slowly disintegrating. The spirit of the people took root in the land, the earth that they stood on. The land had to reflect any discovery of post-independent Sri Lanka. What grew from the land had to be symbolic of the aspirations, hopes and development of a new nation.

Minette describes her vision, which arose " I had to synthesise indigenous traditions in design for buildings for contemporary life, to use whatever materials and means were suitable, the modern and traditional but without eclecticism."4

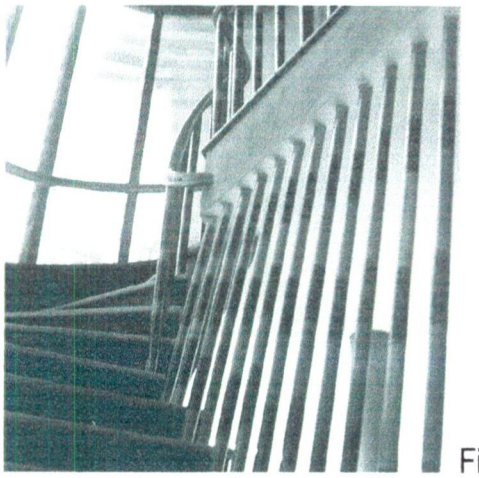


Figure 31

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 186)

The 60 perch plot of Ian Pieris evolved with time. It became a strong unit, a family unit. Pierris house did not stand alone in setting out its mark of Post-Colonial architecture. It was bolstered by Pierris house II by Minette, in which Mrs. Anula Pierris now resides and adjoining to the plot, her daughter lives in a house built by Ulrik Plesner. The unity of the family has resulted in the design for "while understanding the features of the site, I had to understand the features of the site, I had to think about the life of the Sinhalese Buddhist family who were to live in the house to consider climate, regional influences...." 5

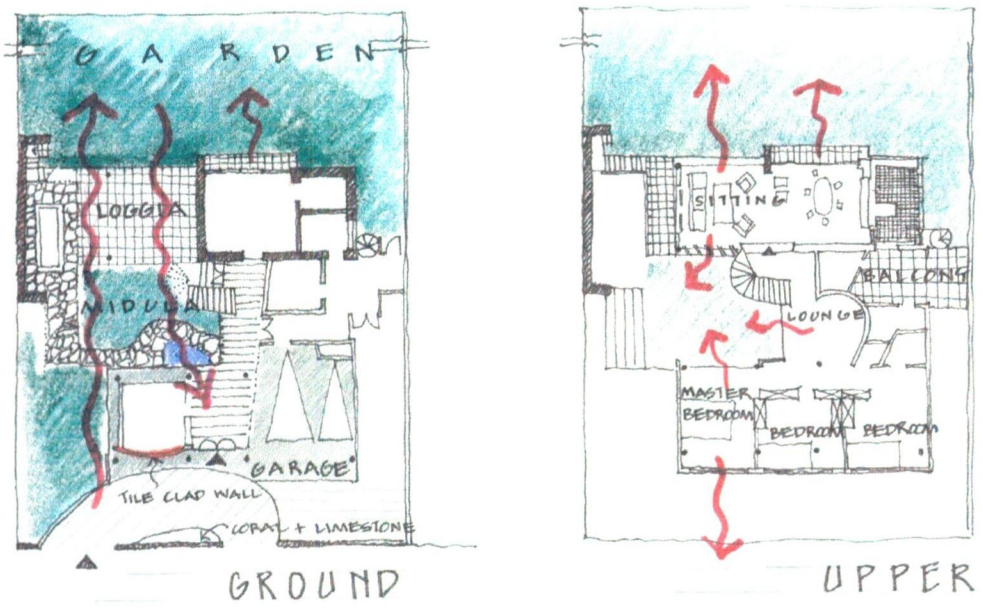


Figure 32

Essence of Material

The terrain of the site is flat, even and can be perceived from one boundary to another. The House is situated directly in axis to the access road. The portion visible to this axis is a coral and lime stone boundary wall, which incorporates detailing for niches meant for festive lamps (meti pahan).

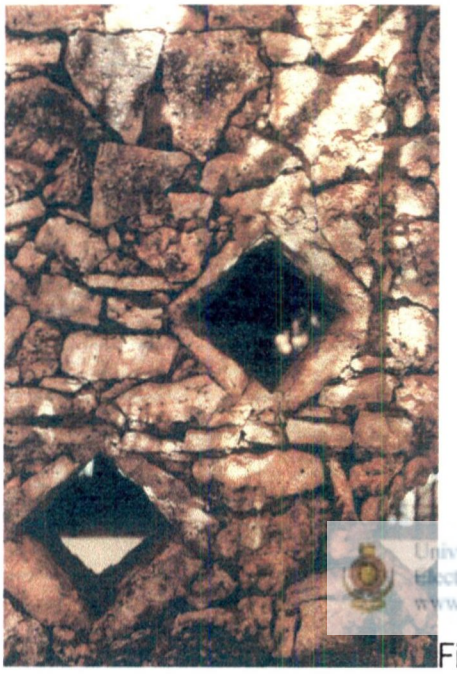


Figure 33

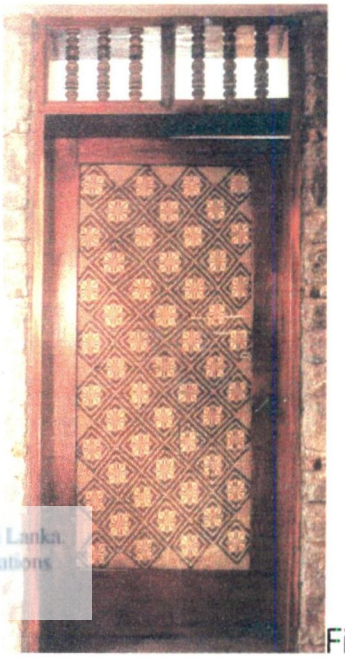


Figure 34

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 185)

Minette experimented with local materials of lime and corals, in the coastal belt which was then considered as waste materials. Urban in setting the Pieris house is situated in close proximity to the western coastal belt of Sri Lanka. This imagery right in the middle of Kollupitiya remind one of what Colombo was during the Dutch period when coral was used extensively as a building material and even to periods before colonisation. Coral still is a traditional building material and triggers association of life at sea, and the economy of the people and the Indian Ocean around the island. A coral is an aquatic tree. It therefore symbolises the upward axis of the tree that is known as the world axis. The roots of the coral which touches the ocean floor symbolises the lower section of the ocean or and abyss. (J.C Circlot, 1971)

Upon entering through the animated wall of coral and limestone one's eye is greeted by hues of green. The house is carried by reinforced concrete columns and sits on a floating slab construction, a maiden appearance in the post-independent era. The house is lifted above eye level. Pools, courtyards, gardens, vegetation and flowers fill the space below. Parking is under the house. The gardens and terraces lead one towards the rear of the site, which enhances the quality of the site and its vegetation. "All the garden area possible is collected within for the enjoyment of the householder." 7

Figure 35

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 187)

The lifting up of the main core of the house evokes impressions of a Tampita vihara. These traditional buildings were raised above ground level and this safeguarded the building from the elements and termites. The drawing of inspiration from traditional building techniques to create a post war house symbolised the history of a rich culture. "Looking closely at Lanka's past in architectural terms I found that a structure considered modern was used (in materials) by the builders of Anuradhapura and onwards to the latest Kandyan period. Columns supported the structure with or without enclosing walls, allowing cool breezes to pass through unhindered" 8

Figure 36

Figure 37

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 181)

The use of local material and crafts is significant in Pieris house. The integration of indigenous craftwork into the design makes Pieris house a symbol of Minette's advocacy of "modern with traditional". The tiled wall with its decorative dance figures (inspired from Embekke devala) is a featured curved wall against the black and white entrance forecourt. The tiles evoke sensations of earthy organic quality of the material against the crisp lines of the concrete structure, which rises above it.

Figure 38

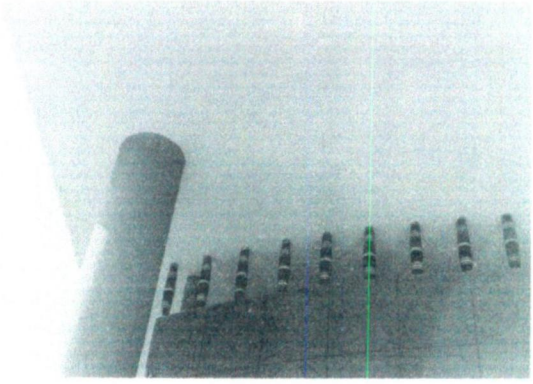


Figure 39

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 184)

The pilotis rises up to lift the floating evoking imagery of a slender enclave of trees with foliage above. In contrast the decorative tile paneled wall touches the underside of the floating slab with beeralu. The beeralu with its laksha etching draw connotations of flagpoles of the

Sinhalese kingdoms. The wooden poles soft in nature contrast the hardness of the slab it reaches out to and supports.

The organic wooden material continues to thread itself up the winding reinforced concrete staircase, as a lacquered railing. The horizontal timber railing is pierced with striped lacquered balustrades striking the treads of the staircase at an angle.

Figure 40

Figure 41

(Source: De Silva Minette – "The life and work of an Asian woman Architect". 1998, p 186)

The lacquered balustrades are associated with the intricate ancient crafts which are well known as 'niya poththen weda' or 'finger nail work'. It draws images of the lac insects, the process of melting of the lac in narrow bolster-shaped bags of thin cloth, and the drawing out of the long stout ribbon of glistening fibrous lac of a bright golden brown colour. Ananda Coomaraswamy states "Sinhalese lac work is characteristic by great brilliancy and gaiety of colouring ...and the simplicity of the interior, made such bright spots of colour perfectly appropriate." 9

With the use of material and evolving the essences of the process Minette takes the Pieris house to a innovative creative status of producing a functional family house in an urban setting, enriched by incorporating and adapting relevant traditional materials and craft techniques. The

use of grills incorporating motifs of the Bo leaf triggers images of the divine tree under which Lord Buddha attained enlightenment.

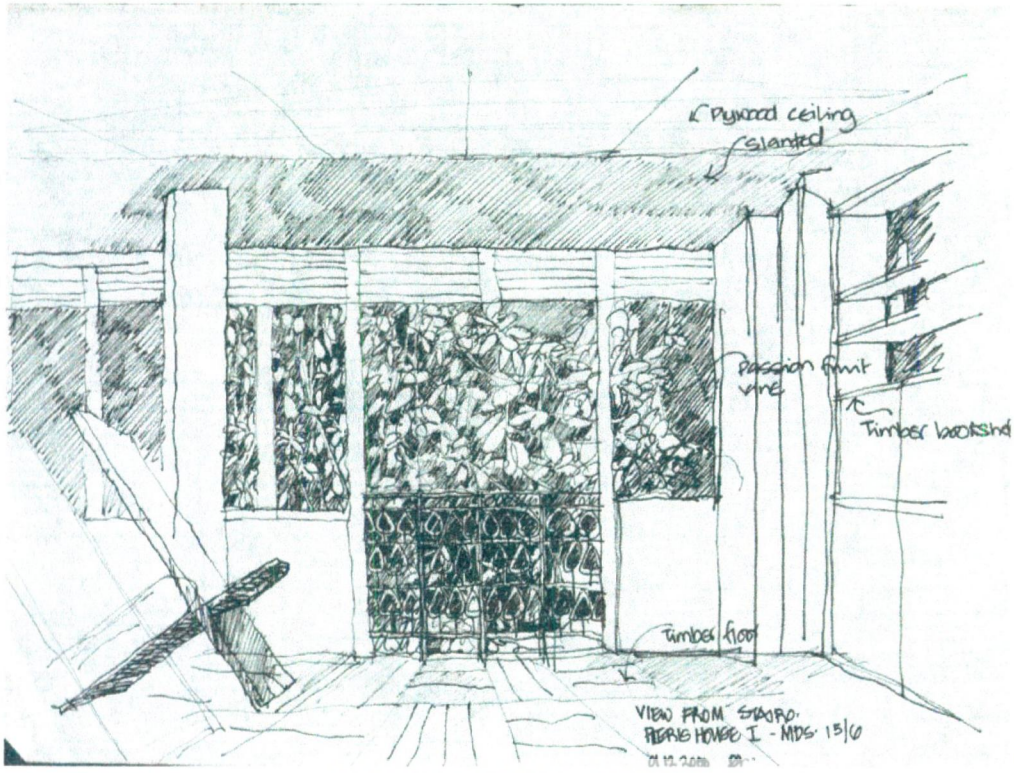


Figure 42

The spatial connection between the two floors flows freely as does air that flows through the house and up through the midula to the upper floor.

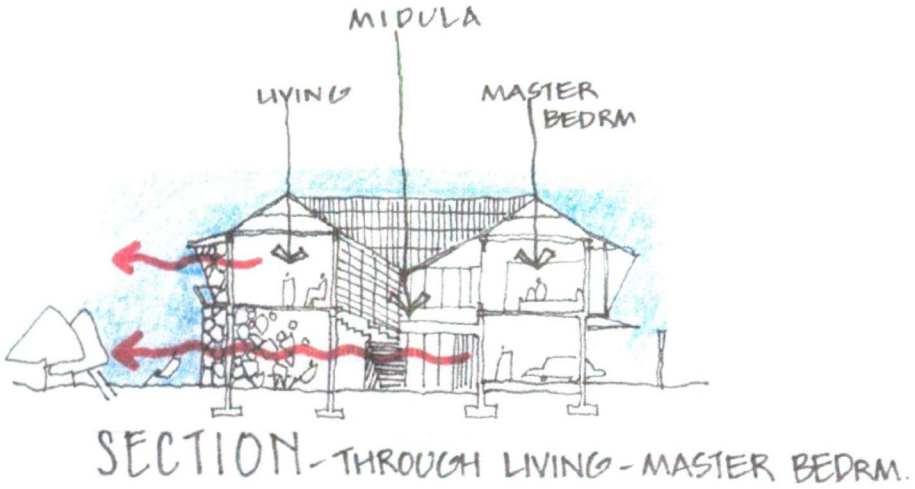


Figure 43

The use of timber cabinets and cupboards as divisions between rooms creates an intimacy. Once a living element, it has now has been incorporated into the life hold of the house. Timber is used as an incorporating medium between concrete and masonry.
The use of materials and the use of their essence are consciously done by Minette de Silva. She says " Materials have their own language: timber materials with natural finishes laterite with rubble, stone etc... concrete only to suit the buildings needs here again using modern but thousand years old tradition of pilotis and infill walls" 10

Unity in Architecture.

Unlike the physical unity of the grandeur of the mountain with the house, as with Andrew Boyd's Kandy house, the Peiris house unites architecture and place with the social implications of an era. Minette de Silva uses materials and their essence and process of making, to draw and express the immediate Post-Independence movement in architecture witnessed in Sri Lanka. The essence of local materials, local craft and local art binds itself together in presenting a symbolic statement of a striving nation after independence. The influences of colonization had uprooted the traditional sensibilities. To rekindle interest in the work of craftsmen and artists, and to integrate these crafts in a built form reflects upon a unity of both in built form and traditional pride. To enable traditions being brought back to life to suit the changing times was done through use of the medium of material essence.

The urban quality of the site, the spirit of the city awaiting changes in constitution and way of life, weighed heavily upon the context of Pieris house. The use of traditional crafts and local materials along with concrete and steel was used in design as an expression of an urban context. The unity that was created in terms of form, space, spirit and essence "was quite revolutionary at the time with it's pilotis and free flowing spaces" 11 states Minette De Silva.

The essence of material has symbolised a social need of a turbulent era. The built form became a statement, a symbol of a step towards a progressive nation during post-independence.

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Case study : 03-Polonthalawa Gal-Bangalawa- Geoffrey Bawa and Ulrik Plesner

Former Estate bungalow for Baurs & Co, Polonthalawa, off Chilaw. 1964

Presently owned by National Livestock Development Board (NLDB).

Case Study : 03- Polonthalawa Gal-Bangalawa- Ulrik Plesner and Geoffrey Bawa

Former Estate bungalow for Baurs & Co, Polonthalawa, off Chilaw. 1964

Presently owned by National Livestock Development Board (NLDB).

Figure 44

On the main road leading to Puttalam from Kurunegala a turn off to the left at Nikawaratiya town leads to a vast coconut estate. Presently owned by National Livestock Development Board (NLDB) it was originally owned by Baurs & Company in 1964.

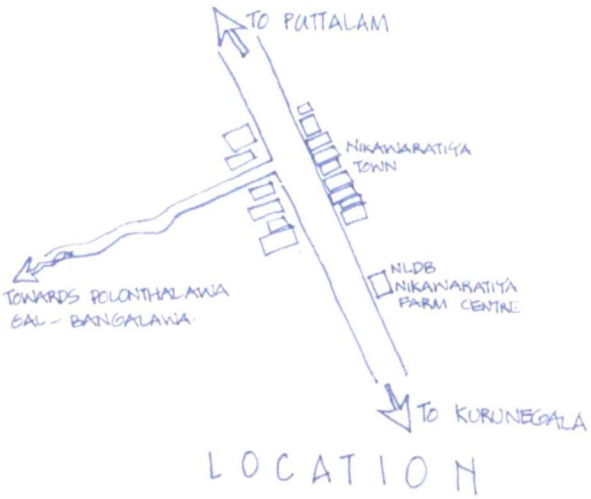

Figure 45

Amidst 700 acres of this coconut plantation lies a valley of boulders. Cocooned by the boulders a house penetrates itself into the valley of boulders. The local name aptly describes the very character of the house, "Polonthalawa Gal Bangalawa". The most prominent boulder behind the bungalow captures a total undisturbed view of the grand plantation. The slim slender coconut trees of the plantation rise up and their geometric placing speaks of human intervention in the flat rolling plains of the landscape. The bungalow in this setting lies low, complimenting the rise of the boulders and the trees.

Architects

In the late 1950's Minette De Silva invited Ulrik Plesner to join her practice. Like Andrew Boyd, Ulrik Plesner was inspired by traditional architecture. He later joined Geoffrey Bawa at Edward Reid and Begg. " Ulrik nostalgically recalls the creative vitality that was there in the early 60's when Geoffrey Bawa and he were totally involved in the adventures of architecture."1

Ulrik Plesner's principles were white washed walls, tiled roofs and timber fenestration and he sought to maintain a higher purpose of architecture which he termed as a "house for our souls"2

Ulrik Plesner worked in association with Geoffrey Bawa in creating the Polonthalawa Gal Bungalow. "The essence of Bawa's work, the product of this process, is one in which form is articulated to a function of movement and experience of the context, either as grand landscape or tight urban space, enveloped in the materials and skills available to him." 3

Buildings designed by Geoffrey Bawa are strongly influenced by the character of the natural terrain, the vegetation, climate and the use of material. " Obviously the architecture one does comes out in two things- the need of the person and the types of materials available for use. Ultimately the rest comes out of yourself. You build as an answer to which gives you pleasure." 4 Geoffrey Bawa says a design should encompass a cultural sensitivity and by the site and materials available in response to it. "The materials used and the forms that the craftsmen are

capable of making have in them an intrinsic respect for the climate Materials and building techniques are seen as a consequence of availability and economy." 5

The economy of the early 60's was such that a restriction on import of non-essentials and travel prevailed. Therefore many of the materials available were the same as in the past and their use very alike. Due to the restrictions a necessity arose for new techniques and exploration of available materials in a new approach that added or changed the quality of the material. New approaches in the field of architecture, art, literature, drama and music were witnessed. " In the early 60's Mrs. Bandaranaiake's government restricted the import of non-essentials, as well as travel abroad. This brought about the creative flowering of the initial joint partnership of Geoffrey Bawa and Ulrik Plesner. It also had other spin-offs such as the vibrant batiks of Ena De Silva, the colourful handlooms of Barbara Sansoni and the inimitable architectural renderings of Laki Senanayake." 6

The design of Polonthalawa Gal Bungalow evolves around the experiencing of living in an estate bungalow. The bungalow states its presence and draws associations with the Colonial era of plantation. The Bungalow draws the essential spirit of the estate into its very being. It is the estate that originated the necessity for a Bungalow. Therefore the very essence of the plantation, location and materials is reflected in the Bungalow.

"In an early project – Polonthalawa (1964)- Bawa and Ulrik Plesner, partner and friend...discovered a spot full of boulders and we both said how excellent and splendid it would be to build a house here. So we pulled some strings, brought some chairs and sandwiches, built it with a contractor who followed every gesture of our hands." 7

Figure 46

Landscape

A landscape is a composition of predominant elements and component elements. "When the predominant element is a cosmic one, its effect is to bind all other components together, and it is this cosmic ingredient which makes it influence felt over and above that of the individual features of the landscape." 8

Such cosmic features of the landscape are the sea, the desert, the mountain peak as in the Hilpankadura in the Kandy house by Andrew Boyd, the clouds and the sky. In Polonthalawa the predominant feature is the prominent mass of rock that rises behind the house to a height of about 30 feet. The view from top of this solid mass is all encompassing. The sky and the clouds are within reach and without a limit. In Lithuania there exists a belief that stones and hillocks have stronger powers than lowlands. Stone is symbolic of unity and strength and is taken in to consideration from the ancient times in which stones were attributed with spirits residing in them.

Figure 47

Figure 48

Polonthalawa landscape takes the form of a undulating, flat, hard terrain. Its relation to the region draws associations of the great plains that roll towards the sea. The open land is a few feet higher than the sea level. The coconut trees evoke the sensation of a seascape.

The coconut trees, the shrubs and plants and the natural elements bind the rocks with the great rolling plains.

Essence of materials

Ulrik Plesner together with Geoffrey Bawa bound the boulders of the land, the terrain and the plantation with the Gal Bungalow, which arose without any drawings. The Gal Bangalawa sits on a landscape with rocky outcrops. The Bangalawa has arisen from the boulders and is unobtrusive. The connection of the building with the land is through the use of the boulders that are ever-present elements in the exterior and interior.

The play of materials in realizing the design concept of the Estate Bungalow to suit the locality and the climate has been done consciously. The texture of the material, the various forms of the material used and scale of use contributes in experiencing the spirit of the site and the life of planters. The Gal Bangalawa of Polonthalawa is of an organic origin with its infiltration with the surroundings in which the use of materials has played a vital role.

The use of a material in realizing the design concept of the Gal Bangalawa is two-folde. The structural appropriateness has taken into consideration the weight, durability and the way they are used in structures, by the treatment of the surfaces and by the dimension and joinery of the units into which they are formed.

Materials used in the transformation of ideas of the Gal Bangalawa into built form is in three forms:

1. Material in raw form:

The use of the boulders as stone columns in the Gal Bangalawa has preserved the stone in its natural, raw status.

2. Materials in a converted form:

The use of timber for louvers, grills and rafters show the raw material, which has been converted, in the form of sawing, cutting and shaping and joinery.

3. Materials in a manufactured form:

Use of mud and clay to manufacture roof tiles, floor tiles under a process of baking.

Secondly the contribution of the essence of material in enhancing the spirit of place of the Gal Bangalawa has strengthened the design concept with the use of different presence of each material, which helps to express the way Gal Bangalawa relates to its landscape. The presence of materials used signifies the material's characteristics. It's the property of that material. Martin Heidegger's core of things where, a material is an assembly of traits particular to its own characteristics and the material presence being woven around the core is vividly portrayed in the use of the essence of materials in the Gal Bangalawa. The essence of materials has taken the design concept of the Gal Bangalawa to a higher built form.

The boulders of the site from which the building springs into being speaks of its distant geological origin, its durability, raw form and the inherent symbolism of permanence. The surface, texture and colour of the stone speaks of the climate and passage of time.

There was always a strong link between the artifact and the earth from which it grew that was not just economic, but deeply satisfying at a psychic level in the by gone days. As Forrest Wilson explains the ancient builders worked building materials carefully. "They begged the stone's forgiveness when they removed him from the ground and asked the tree's pardon for thinning her branches" 9 For the structure of the building can be calculated and the strength of the building materials tested. But it was only through the spirits attributed by the ancients in rocks and trees that helped in sensing the spirit of the building.

Stone is a symbol of being of cohesion and its hardness and durability has always impressed men. The stone is the antithesis to biological things subject to change and decay and death. "The Chinese attributed to the rock a symbolism denoting permanence, solidity and integrity" 10

Building sits on the boulders incorporating it into the interior and all at once the garden and its elements are within the bungalow giving it the apt name of Gal-Bangalawa. The platform the building sits on is of a granite base. This granite base connects and fuses the Gal Bangalawa to

its landscape. The texture and the surface of the granite is an extension of the land on which the building is consolidated.

Figure 49

Figure 50

The elements of the grand landscape have been drawn within the building. The landscape and building integrate and unites in the Gal Bangalawa. The use of the boulders in their raw form contributes to the essence of elemental living. The natural elements have been enveloped and embraced by materials with great skill when creating the built form of the estate Bungalow.

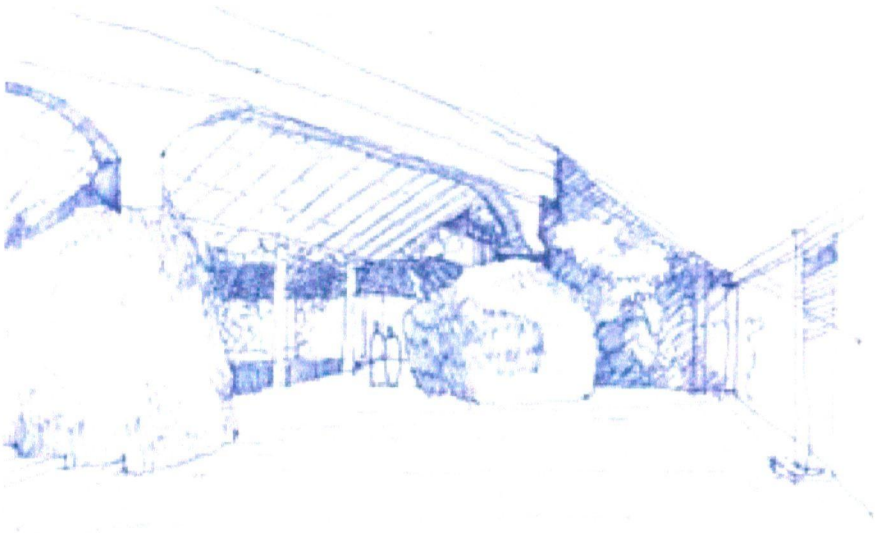

Figure 51

The main living-dining pavilion has a dramatic ridge, which spans two large boulders. Steps and even beds were fashioned out of living rock. The clear span and colonnaded halls invites the environment and surroundings into the interior. Therefore the experience and communication with the surrounding creates the role that Gal Bangalawa was built for, an extrovert estate bungalow.

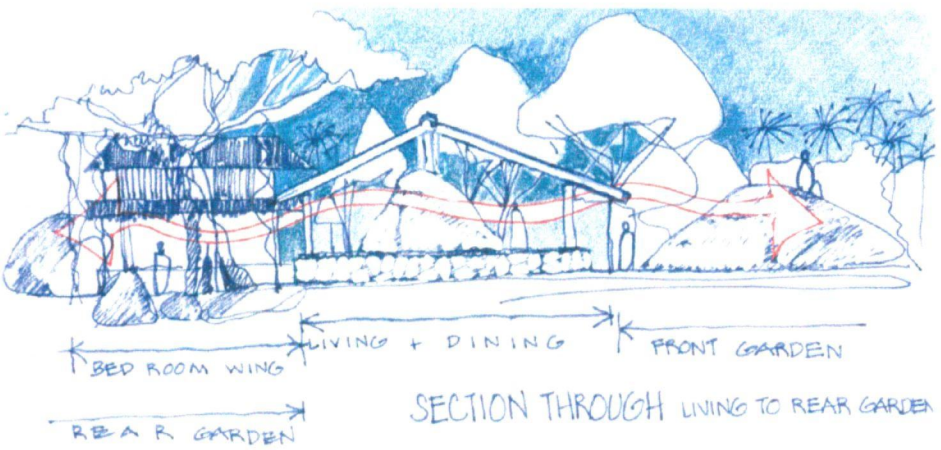

Figure 52

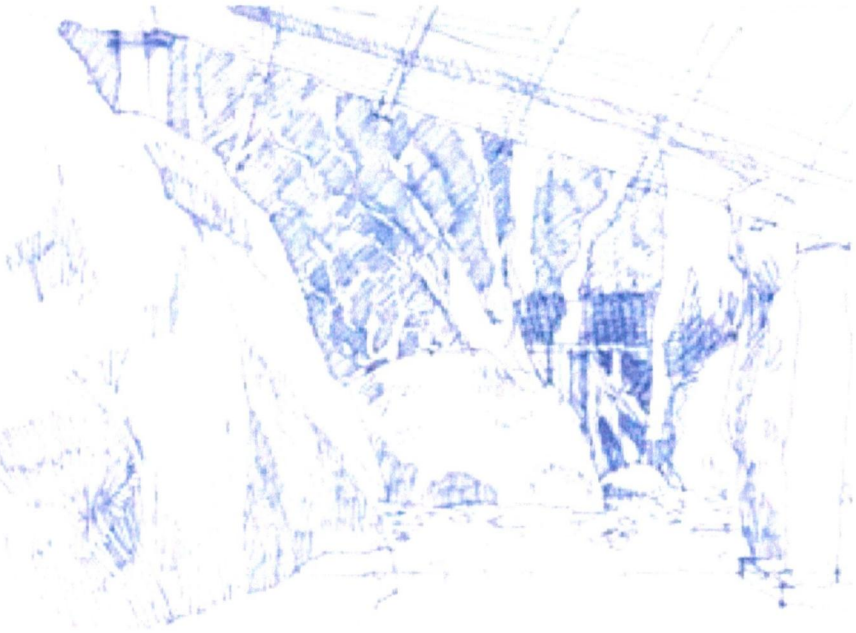

Figure 53

The use of material has been done in the manner to convey the expression of a bungalow with its functions that is arising from the natural terrain and rock boulders. The sense of unobtrusiveness with the merging of the landscape and environment is created through the use of materials and techniques. The environment has taken over the process of maturity and establishment of the one-ness created with the building over a period of time.

Figure 54

Figure 55

(Source: Meng, Tan Kok - "Asian Architect 2". 2001. Pages 52,53)

Figure 56

The presence of timber as a material used in the gal Bangalawa draws many connotations. The use of the trunk of the coconut tree for columns supporting the deep eave colonnade of the living-dining pavilion draws associations of the "Kup Ruka". The "Kup Ruka" as the coconut tree is known from the ancient times provides man with all necessities of life. The tree trunk is used as a building material in the form of rafters and columns, the foliage is used for thatching roofs, the fruit is used for consumption, and sweet treacle is manufactured from the tree and its flower used for auspicious and religious events.

Wood shows its two existences as a growing sapling and careful handling as an element in the built fabric by the builder and carpenter. Timber as an architectural building material is sensual, warm, and rich in grain. Wood has been one of the most popular building materials of, alongside clay and stone, for thousands of years. Wood has unique qualities: as a building

material it is completely recyclable and its stocks are naturally replenished, and as a source of energy it does not disturb the ecological balance of our environment.

The tiled roof of the Gal Bangalawa blends in with the total landscape and foliage. The texture and colour of the tiles is one with the kabook earth. The relation to site with material helps the articulation of form. The manufacturing process of mud to brick evokes the connotations with the land, earth, fire, the kiln and the ageless tradition of construction. For Louis Khan who utilized traditional building materials and stretched their limits to the extremes the brick was seen as a living element. "I asked the bricks how you want to serve this space and the bricks said let us become an arch." 11

Figure 57

Unity in architecture

The Boulders, the plantation and blue sky, builds upon the spirit of the site of the Polonthalawa Gal Bangalawa. The natural environment has permeated itself into the building. Views, sounds of the landscape, the smell of the foliage, the colours of the surrounding and the sensations of the wind and climate integrate the exterior and interior. The spirit has woven itself around the boulders and created an organic plan form that is firmly anchored to the earth by the granite base. The Gal Bangalawa has risen from the site.

The use of rock as a building material in its natural and raw nature draws upon the Rock architecture of the Anuradhapura period. As with the ancient cave temples of Dambulla and the

Water Gardens of Anuradhapura, the Gal Bangalawa has followed in the building traditions and techniques of preserving materials in their essential nature and enhancing the spirit of place.

The verticality of the columns signifies the presence of the coconut plantation and contrasts the bulky solid boulders within the building. The absence of any glazing creates a flow of space, sound, sights and sensations. The timber members placed vertically in the passageway leading to the bedrooms create permeability with the internal spaces and the site. These materials and their essences have enhanced the spirit the space. It has enriched the way one experiences the site, scenery and surrounding. The built form can be touched, smelt and seen and architecture becomes a sensory experience.

The physicality of material draws attention to the material essence. The essential traits and characteristics woven around the very being of the material draws connotations, symbols, associations and deeper levels of our understanding and enriches the way we perceive architecture. There is unity in architectural experience with the contribution of the essence of materials that has incorporated the essential spirit of place. The ability of architecture to contain intellectual content, social meaning and to be able alters some of our psychological and physiological status maybe attributed to the initial sensory perceptions received from the built form and materials. Materials are endowed with meanings and reach a deeper level of conceiving and realizing a design concept.

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3. Meng, Tan Kok - **Asian Architect 2**. Bawa on Bawa.-
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4. Ibid

5. Ibid

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CONCLUSION

Conclusion

Architecture, painting and sculpture are called the "fine arts". They appeal to the eye. Architecture is not judged by visual appeal alone. Buildings are enclosed spaces and these spaces are made out of building materials. They are sited on a landscape that has an essential nature or spirit of place. Buildings affect the human senses of sound, smell, touch, taste and vision.

"Architects like sculptors and painters, work with form, mass, colour, but they can solve practical problems. Architecture is a functional art." 1

This analytical methodology of the contribution of the essence of materials to architecture shows how buildings affect the human senses. The essence of materials draws connotations, relations, associations and symbols of the nature of being and way of life. The way the building sits on earth in relation with the spirit of the site creates a unity in architectural experience. The mind as well as the body is stimulated. The physical qualities of a material take the user on a physical and sensory experience. The essence of materials draws upon connotations, associations and the user is taken through a symbolic experience.

A material is a medium of expression. The relationship between architecture and the essence of materials as a technique of expression has created generations of architecture. The relationship between materials and architecture dates back to the origin of human evolution. The concepts of using materials in architecture from the ancient civilizations to the contemporary times have created an awareness of the essence of materials in architecture.

The contribution of the essence of materials in expressing architecture is a necessary tool in understanding built form, the society of the time and civilization. The methods of using materials help one to understand what the building is about, its concepts and its very character.

The factors analysed with reference to the essence of materials as a medium of expression of architecture are:

a. how the spirit of place has been enhanced by understanding the essence of materials and
b. the kind of symbolic imagery the building seeks to express.

An important feature of this analytical methodology is the essence of a material. The essential traits and characteristics of a material, and its physical qualities transform design ideas into built form. Historically structured by technical advances and inventions the material relationship with architecture is complex. Besides the technical qualities and its physical capacities material draws our responses in a deep-rooted manner. Materials are endowed with their own essence, which can evoke feelings, trigger connotations and symbols.

The forms and spaces of architecture are the creation of materials. The essence of a material contributes in expressing architecture by enhancing the spirit of place. The way a built form sits in relation to its site is enhanced by the essence of materials. Site forces such as orientation, views, access, topography and special features such as lakes, mountains are chartered and the building materials along with the essence of materials. Built form and axes are related to the identified spirit of place. The relationship that is visible between architecture, spirit of place and the essence of materials when combined creates a sensual experience that draws on a deeper level of our understanding through the use of symbols, colours, connotations and associations. It is the essence of each building material, its associations and symbolic imagery that helps to enhance the spirit of place and thereby contribute to a sensory and symbolic architectural experience.

This enhancement of the spirit of place with its boulders, plantation and blue sky of the Polonthalawa Gal Bangalawa is achieved by permeating views, sounds of the landscape, the smell of the foliage, the colours of the surrounding and the sensations of the wind and climate into the building. The Temple of the Tooth Relic, the city of Kandy, the lake, the surrounding mountain ranges, the forest and blue sky, builds upon the spirit of the site of the Kandy house.

On its perch with the vibrancy of the forest behind the clear-cut lines of the white concrete structure has sprung from the site.

With the use of material and evolving the essences of the process the Pieris house is enriched by incorporating and adapting relevant traditional materials and craft techniques.. The essence of local materials, local craft and local art binds itself together in presenting a symbolic statement of a striving nation after independence. It was discovered during the study that the essence of material symbolizing a social need of a time period enhances the final Architectural product. The built form becomes a statement, a symbol for changes in life styles, social norms and a nation.

The essence of materials has enhanced the spirit the space. It has enriched the way one experiences the site, scenery and surrounding. Suddenly architecture becomes a sensory experience. It can be touched, smelt and seen. The physicality of materials draws attention to the material essence. The essential traits and characteristics woven around the very being of the material draws connotations, symbols and deeper levels of our understanding. There is unity in architectural experience with the contribution of the essence of materials.

The links of the material with its essence is very often ignored in the competitive building industry. There is a creation of an architecture that has lost the primary essence of the material. The essence of the material is not harnessed to create architecture. The material has lost its authenticity and meaning. Therefore the essential essence of the material has not contributed to the spirit of place, the building and user. This issue should be addressed or the sensory and symbolic experience of architecture maybe lost and a wrong interpretation maybe derived. The user will be deprived of comprehending the essence of materials. The unity in terms of architecture can be lost.

Like the ancients who venerated the materials for the spirits they carried, today, architects must be conscious of materials and their essence. The true quality of the material along with its essence must be celebrated as done in the case studies, which results in an architecture that

enhances the spirit of the site. The essence of materials and building techniques used in architecture expresses the national identity of a country. Anuradhapura period is symbolic of the use of stone as a building material and the Kandyan period has exemplified timber as its main building material. Likewise a material with its physical properties and essence will play a role in identifying our culture, society and development. The essence of materials is a contributing factor in the search for a national identity of today.

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