On the Path of Light

Final Year Design Thesis

Kassem Eida

On the Path of Light

Architecture & Design. Class of 2009
American University of Beirut

Final Year Design Thesis
Kassem Eida

Thesis Advisor:
Architect Karim Najjar

Thesis Readers:
Architect Karim Nader
Architect Joel Condon

«The sun never knew
until it fell on the wall

how wonderful it was,
of a building.»

– Louis Kahn

ABSTRACT

The thesis explores the use of sun light and its changing path as a tool to create program through spatial moments in light and time.
The thesis defines the aspect of light & shadow, as spatially influential phenomena in nature and architecture. It looks into light as an immaterial element, its power to define form and create material.
The investigation discusses the integrity of natural light and its ability to create evolving spatial moments, on interaction with natural and artificial surfaces in space and the natural context.
It presents a number of relevant case studies pertaining to the use of light in space, both at the level of architecture and the installation.
The theme of natural light and evolving spatial experience is approached and discussed under the phenomena of the changing sun path, its impact on space, the perception of time and change. The investigation process involved an application of light on study models and experimentation with natural light, materials and surfaces on site.
The site, located in Faqra, Kfardebian, on which the natural stone arch (Jisr El-Hajar) sits as a landmark, is examined and analyzed in terms of observation, site topographical surveying, two dimensional drawings in plan and section, three dimensional site representation, in addition to a comprehensive photographic documentation of the site with unique natural lighting conditions, and light exposure studies in cross section.
The thesis introduces a preliminary design vision and program on the selected site in Faqra and presents an analysis of the existing stakeholders.

Acknowledgements

I first like to thank my father and mother for 23 years of love, kindness, care and support which made me what I am now.
I would like to thank my Thesis advisor: Architect Karim Najjar for his helpful guidance, and full commitment throughout the semester, facilitating the process for me to develop my thesis.
I would like to thank my design instructor, great tutor and architect Karim Nader for continuous years of design instructing, motivation, passion for creation, and bringing out the inspiration deep inside.
I would like to thank Professor Joel Condon for his helpful thesis feedback and for assessing my final thesis.
I thank my fine arts instructor, Professor Neville Salha, for his constant moral and academic support.
Special thanks to Vassilli Kassab for helping me with the booklet presentation, and to my fellow friends and architects Mardig Troshagerian and Halim Kheriaty for their advice and support throughout the thesis.

Table of Contents

1.**Introduction**
2.**Research & Investigation Methodology**
3.**Yin & Yang**
-[CASESTUDIES]:
+ Mountain Tindaya Project - Eduardo Chillida
+ Church of Light - Tadao Ando
+ The Pantheon in Rome, Italy.
+ Dhayanalingha Temple at Villianghiri, India
4.**Experimenting with the Light**
5.**Observing the Sun**
- [CASESTUDIES]:
+ Stone Henge – Wiltshire, England.
+ The Sun Pyramid - Teotihuacan, Mexico
-The Path of Sun
-Sun Diagram
-Zones of Light
-The Figure 8
-[CASESTUDIES]:
+ The Roden Crater Project – James Turrell
+ The Sky space Installation – James Turrell
7.**Site Analysis**
-Site Access
-Site Description
-Seasonal change
-Site Observations
-The Natural Arch
-Researching the Monument
-Sunlight Exposure
8.**Investigating Surfaces**
-Water
-Color
-Metal
-Fabric
-Glass
-Snow
-Tree
9.**Thesis Statement**
10.**Design Vision**
11.**Program**
12.**Stake holders**
-Description
-Analysis

Introduction

The eye of the creator is trained to observe everything in the surrounding. It learns to look deeply into the aspects of the material and immaterial world. From a simple shadow cast by a waving tree on the sidewalk, to a human silhouette behind glass, to a ray of light cutting through darkness from a pierce in the wall, the eye can then appreciate what is beautiful.

My interest in light comes from its dual existence with shadow. Shadow is the contrast to light and a whole dimension on its own. More interesting is the potential power of light, as an immaterial element, and what light can produce, on interaction with the material.

At the beginning of the thesis, I was searching deeply for a particular spatial interest which I wanted to investigate comprehensively. My first thoughts hinted the word: «Skin», which is a general theme that could be tackled from various perspectives. The process of searching for a particular spatial affiliation was endless, and at a moment in time, my frustration drove me to pin up on the walls all the text I have written, the observations I have noted down on my small diary, the facts I have researched, the images collected, all the photographs I took and placed in albums on my shelve and the projects I have been designing throughout the five years at the design school. I have pinned up everything on the walls of my humble room and finally started to see the light.

It was clear that everything on the wall was selective and clearly had something in common. It was the beauty of natural light and the dialogue it had with surfaces. The theme «skin» which I have chosen for investigation in the beginning, was of thousands of materials that manipulated the light. It was clear that the inner self longed for the light, and at a certain point, I could not be more convinced about my interest in natural light as an influential tool in shaping space.

The thesis has helped me gain a thorough understanding of light and its properties in space, the process of change in natural light governed by the sun path, and how natural light behaves differently with materials and surfaces in space and nature.

Research & InvestigationMethodology

The research process has been approached, by looking into existing literature of books and publications by architects, designers and artists whose work involved the use of natural light in space. The thesis involved researching and analyzing relevant case studies, both historical examples and contemporary ones, to help present a variety of tested approaches into the application of light in architectural space.

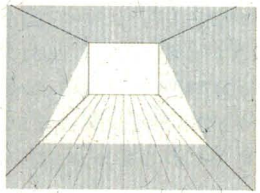
The research was done in parallel with an investigation into material properties, the effect of light on material, and study model experimentations with light, to demonstrate the behavior of light in space and on surfaces, in addition to field visits on site. The field visits involved a process of dissecting the selected site through topographical surveying of the land terrain, observations of the site>s physical aspects, natural and light conditions, analysis and photographic documentation, in addition to the application of light studies on the site, in cross section. The thesis investigation involved experimentation with natural light on materials and surfaces on field.

Yin & Yang

Light and shadow are immaterial. The two elements are like yin and yang. The dimension of light exists only because shadow exists, and vice versa.

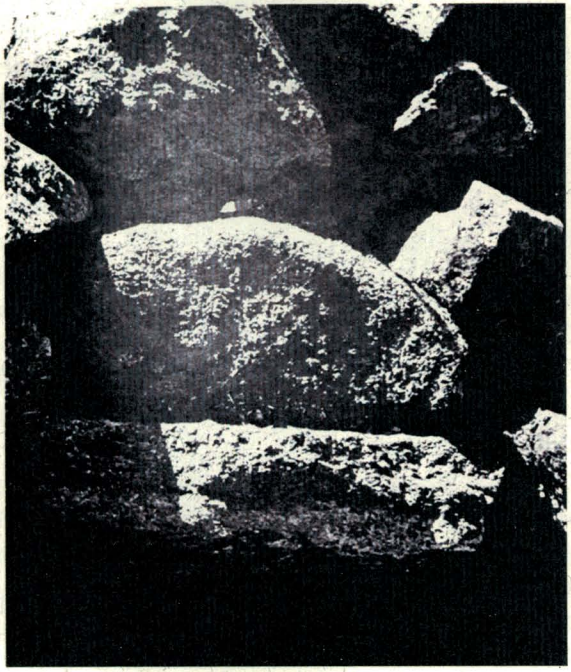
This dual existence of the two elements defines the physical presence of objects in space, and objects have mass, volume, dimension, material and form, which lack spatial meaning in the absence of light and shadow.

If we look at a piece of sculpture which receives light intensively and equally from all sides, one cannot feel the form of the object due to the absence shadows. The object would appear visually as a two dimensional surface or a silhouette with lines. When the sculptural object is placed in a dark room and then lit by one spot light above it, or sunlight entering from a small opening in the space, parts of the object receive the light, other parts are shaded, and the object casts a shadow onto the wall.

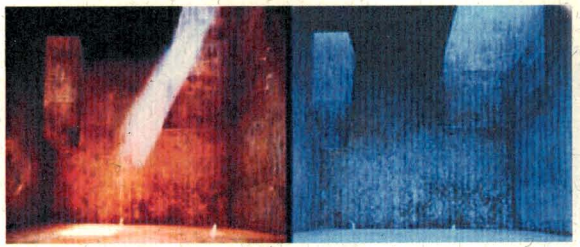


The light and shadow relationship defines positive and negative spaces within the sculpted piece, mass and void relationships and the degradation of light and shadow emphasizes curvatures and the flow in its form.

If we take a natural stone wall under the sun light, light and shadow identify the physical form of the rocks laid on top of each other, negative spaces and voids shaded in dark between the stone masses that receive the light partially, and one starts to feel and appreciate the surface and texture of the stone, which casts shadows itself, and renders the surface under light and shadow.


Mountain Tindaya - Eduardo Chillida

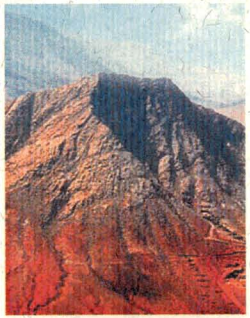


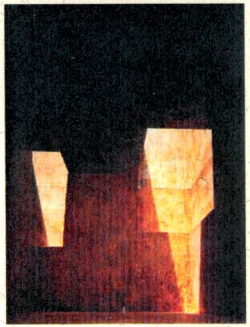
One of the works I was interested in, a work involving light, mass and volume, is the Mountain Tindaya project by the Spanish land artist Eduardo Chillida.

Chillida adopted a radical stand, intervening on the whole mass of the mountain Tindaya, by carving out the mass and hollowing it out, which created a massive space inside the core of the mountain.

He created a void within a rigid mass, and to define and highlight the volume inside, Chillida pierced the space ceiling with two large openings into the top of the mountain, to let light into the space. The light enters the space at different angles throughout the day and the year, with the changing sun path.

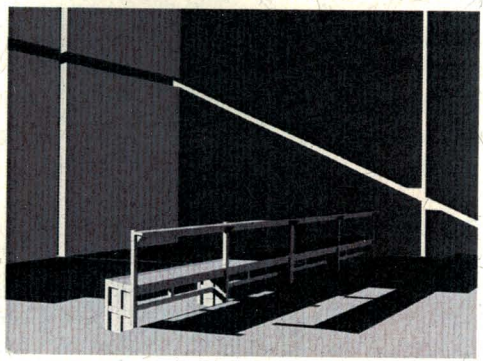
At certain moments, the sun is vertical in position, and light enters sharply, empowering the void-solid relationship inside the mass, through shadows.





At other moments, light enters indirectly, more diffused into the space, and as the sun starts to set, the place starts to adopt a dimmer color. It is how light at different times of the day entered the space and interplayed with the reddish orange surface of the natural rocks, which renders the space differently throughout the day. And what empowers the light as a spatially influential element is the darkness of the whole volume, and the shadows in contrast to the light, which all together interplay with the surface of the mountain interior to reproduce multiple scenarios of one space.

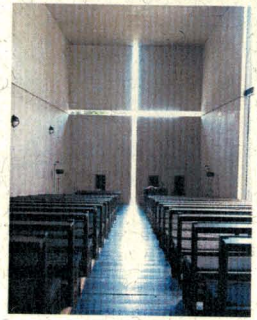
Church of Light - Tadao Ando

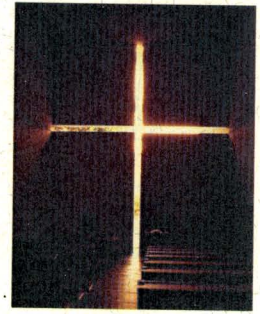


Looking at the Church of Light designed by Tadao Ando, in Osaka, Japan. The whole church space is an enclosure, a box of concrete walls through which sun light cuts sharply at different angles throughout the day and the different seasons of the year, depending on the position of the sun and its path. The light cuts sharply into the dark space, through narrow 20 cm openings, hence light becomes an integral element in space and more spatially influential when it projects onto the concrete walls, the wooden benches and the dark shiny surface of the wooden deck.

At different times of the day, the church space appears differently. At one moment in time, the space appears dark, at others it is dimly lit and feels cold, and at certain moments it is well lit and warm. Hence the users experience the space differently at different times of the day and seasons of the year. It is due to the power of light and its integrity in space as one single sharp element cutting through the barrier,

which is the wall. The evolving spatial experience inside the church, the changing reflections of light and its moving projections on the concrete walls enhance the perception of time in space, even when the space is an enclosure. The perception of time and change in space dissolves the rigidity of the wall and the barrier between inside and outside.





I reach a point in the analysis; the ability of light to produce a changing spatial experience lies in its integrity within space, and integrity is strengthened by spatial contrast between light and dark. Hence, in a space with large openings, through which light enters and diffuses, light is less sharp, less defined and the transition in the changing sun path and light intensity is less prominent, hence the perception of time and change in space is weaker and spatial experience is somehow constant.

The Pantheon - Rome

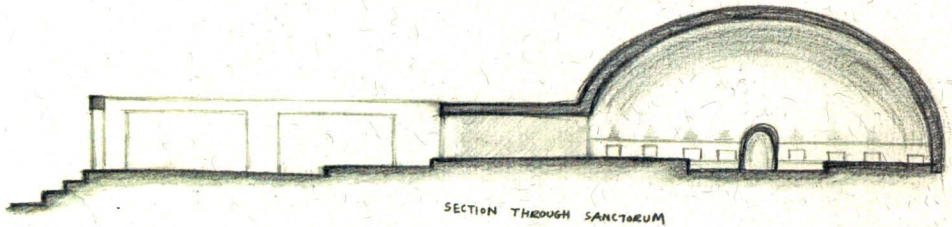
In the Pantheon of Rome. The space is domed and enclosed. The eye is automatically drawn upwards, towards the light, which enters sharply through a circular opening, and projects a spot of light onto the dome interior. Throughout the day and the various seasons of the year, with the change in the position of the sun, the projection of the light spot moves with the changing angle of the sun. It highlights the volume of the dome and the square voids created on its interior. At early sunrise, the space is dark and dim, and as the sun rises in the sky, the space becomes more lit, until the sun reaches a position, where direct light sharply enters into the space through the opening. It projects onto the voids and surface of the dome. One may say that the pantheon is a space created for observing the light. It is like a sundial, defining spatial and transitional moments in light, surface and time.

Dhyanalingha Temple

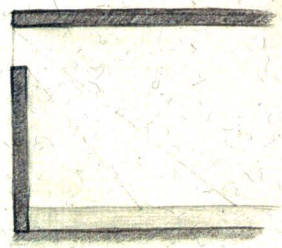
Inside the Dhyanalingha Temple in Villiangiri, India, the spatial transition between openness and enclosure, under changing heights of the sky, the vault and the intensively lit dome interior, exposes the worshippers to a series of light and shade relationships.

Inside the water bath space of the temple complex, sunlight enters sharply into the bathing space at a particular time of the day, through an opening in the wall. The sun light strikes the surface of the water, and creates a moment in light, where the water surface reflects the light onto the reddish pink stone wall, creating light textures and reflections onto the wall surface.

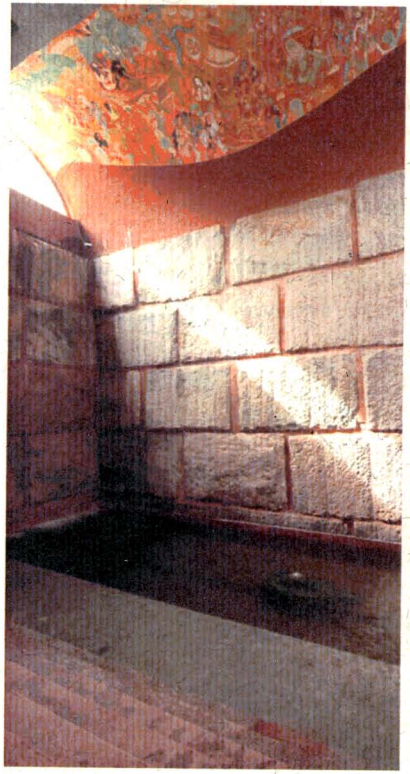
In such an enclosed space, light defines a particular moment in time, a moment in light, marking the event of a program or activity like bathing in water, it enhances the feel of time inside the space throughout the day, and the porosity with the outside, through interaction with the surface of water and the surface of the natural stone wall, at a certain point in the sun path.



SECTION THROUGH SANCTORUM

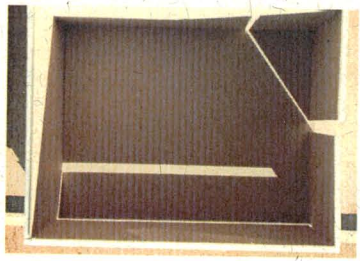


PARTIAL SECTION THROUG WATERBATH



Experimenting with the Light

Light travels at a speed of (---) from its source, and the farther it travels away from its source, the weaker it gets. If certain surfaces or materials are introduced in the light>s way, as mediums that could drive the light into space, reflect it, and refract it, split the light into fragments or compact the light, then light integrity could be emphasized and amplified throughout its path in space. Its changing aspects and intensities can be enhanced and used to create different spatial effects in space.

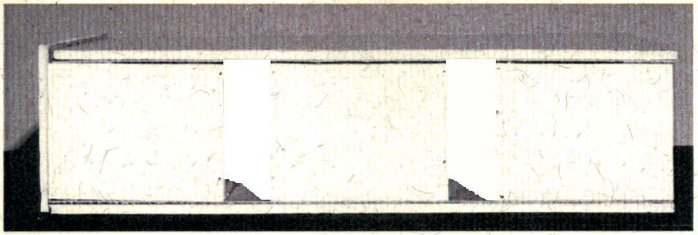


At a certain stage, attempting to reach an understanding of light, and its behavior, there was a need to experiment physically with light on study models. The study models I have built, were abstract and had no definite relation to any site or program, but were essential for experimenting with light and projecting light through its openings, walls, and surfaces.

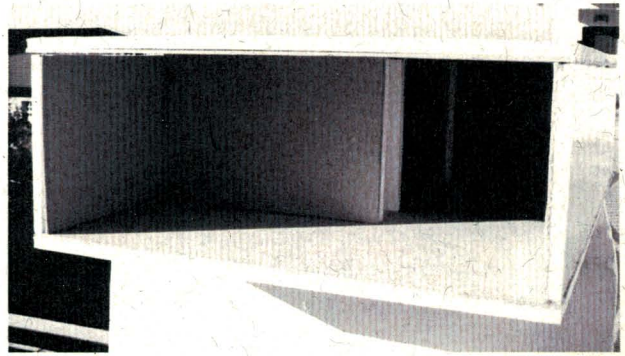
Experimentation involved the use of sunlight and artificial light projected by a flashlight. I was moving the light source in attempt to depict the sun path or in case of natural light; the sun took its own path.

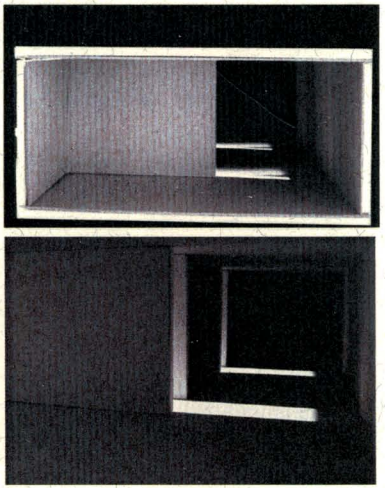
I observed how light filtered into the space through circular openings, wide slots, and narrow openings, both vertical and horizontal, at the top and on the side facades. In study model, light projected on the walls and floors of the space. It produced lines, and bands of light against dark ones. These projections and reflections of light changed with the change in sun path, producing different light scenarios.

Order Model

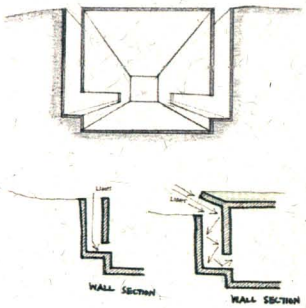


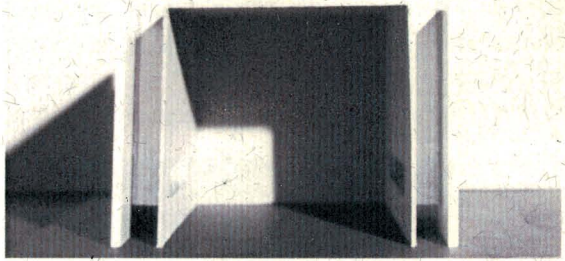
In one of the models, several openings, equally distanced were created. And as the sunlight entered the space, the walls cast shadows, while light projected its bands on the floor. The light has created a sense of spatial order, where such a space on a large scale would take the users into a series of dark-light-dark-light relationships, and enhance the perception of opening versus enclosure. Light and shadow are two different volumes. This order of light and shadow changes with sun path, and the light-dark bands start to shift in terms of angle on the floor and the wall, whereas at a particular time in the afternoon, they are straight, perpendicular to the surface, and equally ordered.

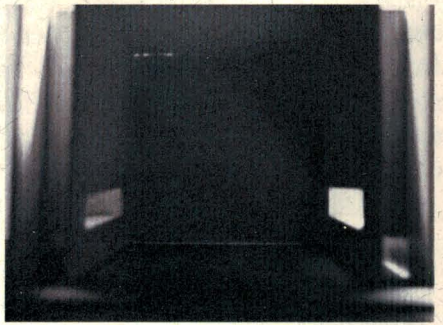




Indirect Light Model



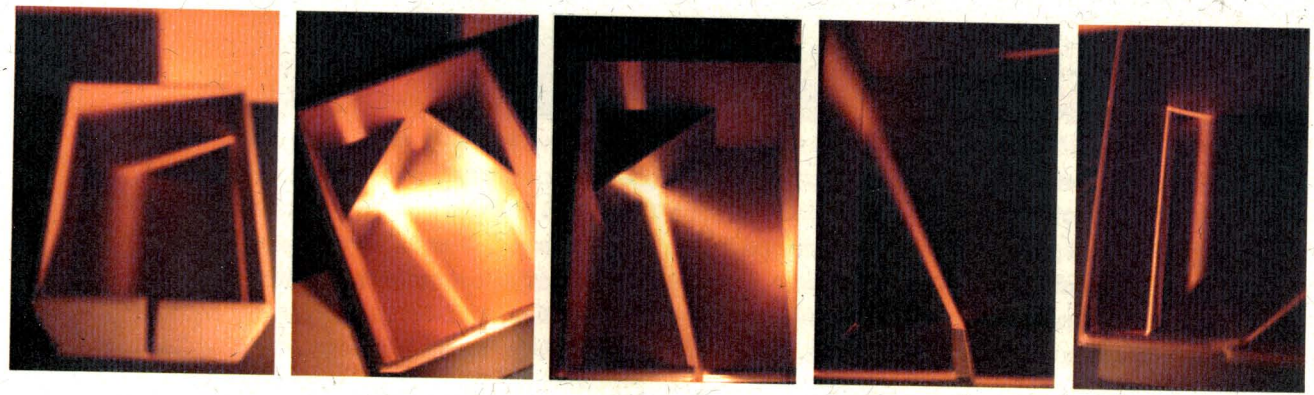




Another study model involved experimenting with indirect sunlight, attempting to drive light indirectly into the space in between the walls. I built a model of an enclosed corridor with long narrow openings stretching on two sides. The openings within the walls are lit at certain times of the day and particular positions of the sun, when light enters the void in between the walls and gets reflected by the walls down to the bottom. The light may hit the bottom surface vertically, lighting up the two sides of the walkway indirectly, and at other moments of the day, they are dimly lit. The light emphasizes this long walkway in perspective at certain moments.

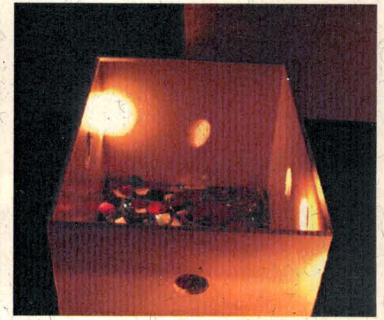
Metal Reflections Model

After observing the behavior of light with regard to the path of light, I was driven by curiousity to manipulate the light path in space. I inserted a reflective metal piece and projected light through the walls and openings onto the metal surface, which reflected the light further onto the opposite wall. I experimented by adding another metallic piece, opposite to the first one and started the path of light from east to south to west of the model. The light projected on the walls and floor, and was reflected indirectly onto the metal piece which diffused the light dimly. At a particular moment in its path, light hit the metallic surface which reflected a beam of light onto the second metallic surface which further reflected the light onto the opposite wall. At a particular position of the sun light, a moment of reflections is created by the metal, lighting up the whole space.

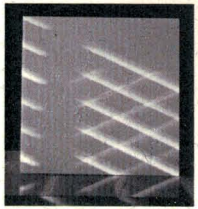


Colorful Reflections Model

Into another study model, I pierced circular openings of varying depths. Light entered the space, and projected spots onto the walls. As the position of the light source changed and became more vertical, at a precise position of the source, light filtered through one of the round openings and hit the floor surface; surface of colored reflective pieces which reflected colorful textures all over the space. At a moment in time and sun path, a regular space turns into a wonderful scenario of colors, textures and reflections.The Light activates these surfaces.



One of the accidental experimentations with light took place one afternoon, when I opened the louvered shutters of my window, where the sun light had hit from the west. The louvers cast line rhythms of light and shadow all over the room, and projected on the face of one of the study models which were placed on a partially reflective veneered table. The reflective table surface reflected a mirror image of the light rhythms which had been already projected on the model, which produced a counter rhythm of light and shadow texture which further projected over the surface of the white box.

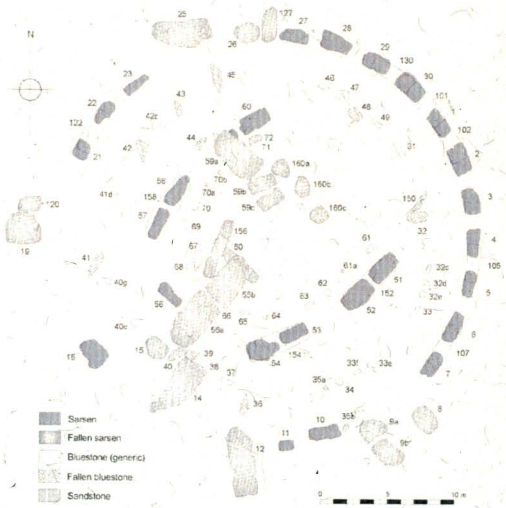


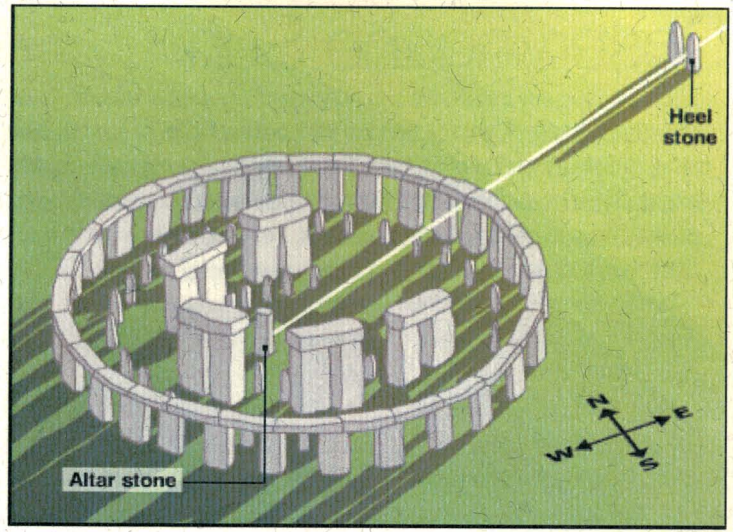
Observing the Sun

Throughout ages of history, human civilizations have gone about defining a sense of order in their daily lives, and programs. They have searched to identify their existence with a somehow superior power or source that could govern their ways of living, creating, adapting and re-adapting. Certain human civilizations have attempted to define order, through time, starting from the earliest ancient and primitive creations, the sun and its light governed their day to day practices, occasions and ceremonies. Besides the use of sun light as a tool to define time, certain cultures perceived the sun and its light as a focal point in life, holding a powerful symbolism in terms of human beliefs. Ancient civilizations such as the Mayan and the ancient Egyptian appreciated the light from the sun. The sun which shined over meadows of crops. The crops which fed the population, and earned the wealth. The wealth which produced economic surplus. The surplus which made the civilization capable of achieving resources to construct massive structures and monuments that paid back the tribute to light and the sun, as they functioned with respect to the sunlight. The sunlight which determined the beginning of ceremonies inside these monuments. Ceremonies of belief and power. The power which ruled the people and commissioned further expansion of civilization.

Stonehenge

Dating back 2500 B.C., one of the early pre-historic creations, the stone henge located in the English county of Wiltshire, a series of natural stone masses, varying in stone type and size, arranged in rings or crescents around a focal yard, acted as prominent monuments. The stone henge beholds a mystery behind its construction and function. Many scholars believe that the Stonehenge was part of a ceremonial landscape, on a land which housed burials. It is believed to be part of a journey on foot, which reached the Stonehenge site, «a journey from the phase of life to the phase of death» on a land of burials. A spiritual journey in time. During the





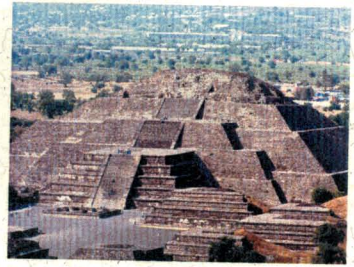
late 19th century, the Stonehenge was used as a space for pilgrimage for neo druids (a modern form of spirituality or religion which promoted harmony, balance and the appreciation of nature) and other neo pagan religious sects. It was a point of attraction, particularly at the midsummer sunrise time, when the Stonehenge masses created a dark silhouette against the sunrise horizon with the stone henge masses casting shadows that change with the changing path of the sun. They act as markers in time, and markers of ceremonies practiced by mysterious sects longing for the light and the sun in nature. The stone henge is analogous to the rod in experiment, which was previously mentioned. The rod which casted shadows against light over time, and led the curious observing pioneer to discover the «Figure 8» ana lemma, one of the magnificent truths about the sun and its path.

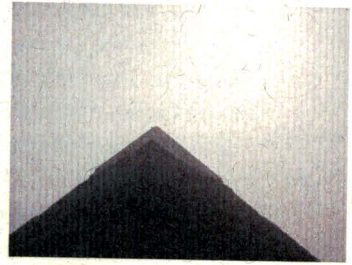
The Sun Pyramid

I further like to express my personal affiliation with a one of the great civilizations that celebrated the light on earth; the Ancient Mayan civilization and the magnificent sun light structures built on the hands of its people.

At Teotihuacan, located in the basin of Mexico, one of the largest structures: the Sun Pyramid was erected around 100 A.D. by the Mayan civilization over a natural cave which ends in four chambers near the centre of the pyramid. Natural caves symbolized a passage to the underworld and the womb of earth. The Sun pyramid was constructed to honor the birth of the sun god (Kichen Ahua) and the moon god (Ix Chel). It was the end destination of a procession taken by the priests on a roadway axis which starts from the Moon Pyramid, erected on the same site (see site plan).

The Sun pyramid is laid out in a way that it faces 15 degrees and 30 minutes northwest, so the sun sets on axis with structure on the day of the zenith passage. The physical layout is based on

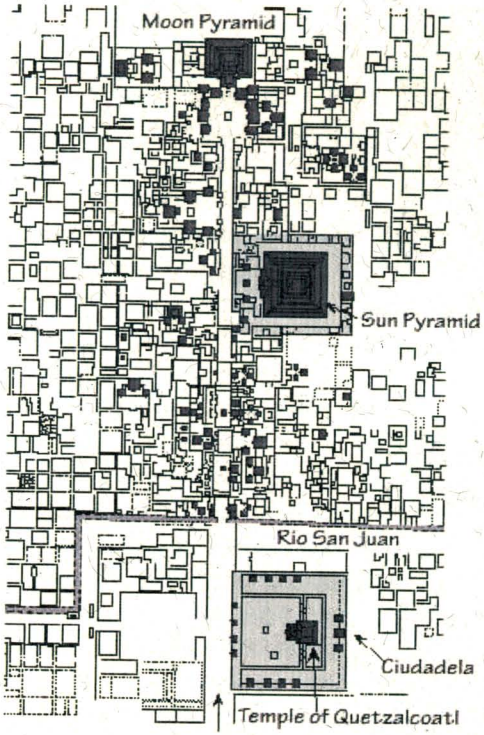




the path and position of the sun throughout the year, and it administers the axial arrangement of the other structures at the Teotihuacan site. The city was built as a center for ceremonies rather than an urban habitat, to observe the relation of earth to sun by the yearly zenith taking place on June 21st every year. The buildings on site complement each other with respect to the sun path and position, under a certain hierarchy determined by the ceremonies and processions.

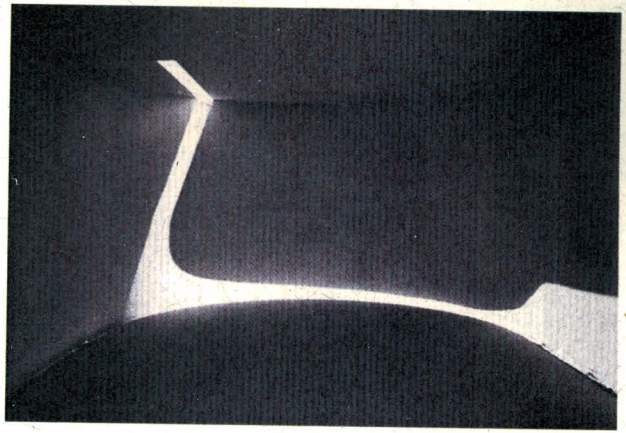
Hugh Harleston Jr. believed that the entire complex, in terms distance and proportion, is a precise model of the solar system mapped on earth.

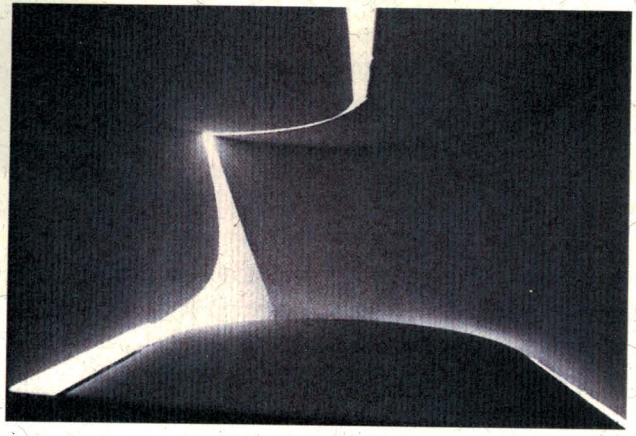
The Sun pyramid is oriented northwest of the sunset point in the horizon, on two days of the year: April 29 and August 12. The day August 12 was considered culturally sig-



nificant to the Maya civilization as it marked the beginning of the «Present Era» and the first day of the Maya calendar.
The pyramid is aligned with a horizon point where the sun sets on July 25 and May 17; two days of the year during which the sun sits exactly on top of the pyramid>s peak at mid day zenith, «uniting the heavens with the centre of the world» in terms of the Mayan beliefs.
During the equinoxes, the sun passage from the south to the north resulted at mid day in the diminishing of a straight shadow which spanned across one of the lower stages of the pyramid>s western elevation. This process lasted only for one minute.
The story tells that one of the ceremonies taking place inside the cave underneath the pyramid: the beginning of «The New Fire» sacrificial ceremony was marked by a moment in light, when the sunlight entered the cave through an opening directed towards the setting sun on May 19 and July 25.
Hence, the Sun pyramid is a monument celebrating sun light and governed by the sun path specific to that site. It is a regional and light responsive structure; a tool operated by light, in the sense that without the sunlight and the specific path of the sun, the program inside the building cannot function and possesses no functional or symbolic meaning. If the Mayan builders are to take the whole complex with the buildings and place it as it in another context, it cannot

The Path of Sun



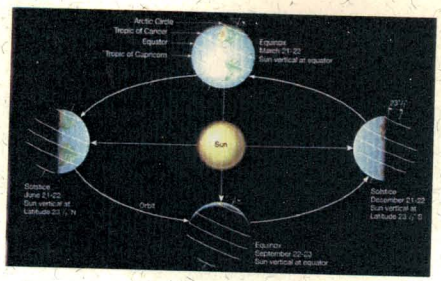


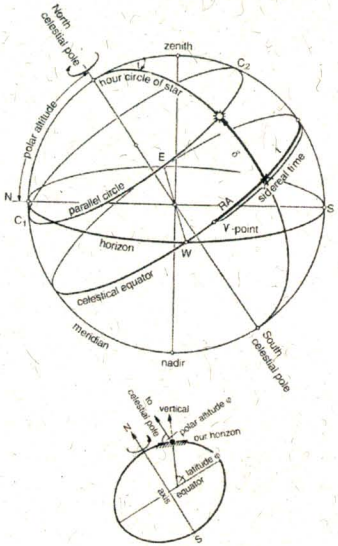
function. Light is the creator of the program, and the painter of the ceremony scene.

Architecture is mass and volume. Architectural space is static. Spatial experience is different. It evolves when space is cut sharply by the light. When light pierces into space, through a narrow gap, a hole in the wall, it becomes an integral element inside this volume. This integrity of light creates an evolving spatial experience, because light comes from the sun, and the sun is a varying element. It seeks a changing path, from east to south to west, projecting its light onto the earth at different horizontal and vertical angles. With sunlight as a varying factor, the sharpness of sunlight infiltrating into a space creates a more visible transition of light and a more prominent change in the experience of the

space at different times of the day and throughout the seasons. The perception of time in space becomes strengthened. There is a misconception about the sun. In fact, the sun does not move. But the earth rotates around its own axis, throughout a day, of twenty four hours, and rotates around the sun throughout a year, of three hundred and sixty five days, which makes the sun appear as if it is moving, but in reality, earth is moving and the sun is not. Both earth rotations take place in parallel, hence this produces what is known as the changing sun path, and the four different seasons: summer, fall, winter, and spring, which evolve around the phenomena of different earth degrees of sun light exposure.

Light is an essential natural element. It influences the form of life, the natural creations and the man-made. At different spots on earth, living and non-living things are created according to the sun. From plants to animals to architecture. They all adapt and re-adapt to the sun, the path taken by the sun and the light.

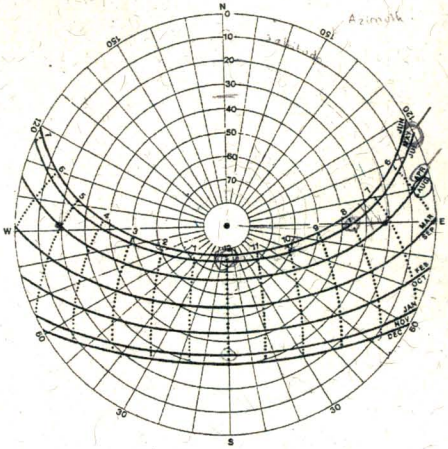




One of the most fascinating creations on earth is the sun flower. It rotates, bends and leans towards the light. It creates its own path of movement with the changing path of the sun.

Sun Diagram

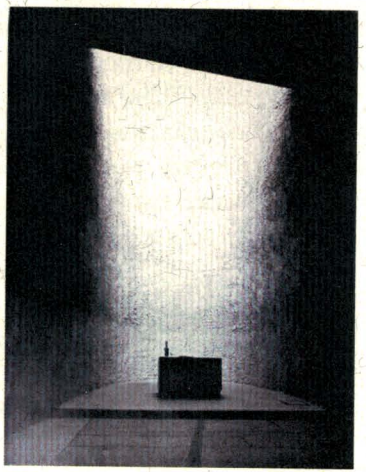
One of the tools that dictate the path taken by the sun during the day and throughout the four seasons of the year is the sun path diagram, which illustrates the position of the sun in relation to particular location on earth at different times of the day and different months of the year. It shows the vertical angle degrees (the latitude) and the horizontal angle degrees (the azimuth) at which the sun hits a particular location, object or space. The azimuth is represented on the vertical axis of the diagram, and the azimuth is represented on the circumference of the circle diagram. The sun path diagram for Lebanon (36 degree latitude) shows that during the month of June, there is the longest day of the year, where the sun reaches the highest vertical position at 12 o clock noon (75 degrees vertical angle). In June, the sun rises slightly from the north east at 5 AM (117 degrees horizontal angle in plan) and sets slightly from the northwest at 7 PM at the same azimuth. While during the month of December, there is the shortest day of the year where the sun hits a particular space at the lowest vertical angle at 12 o clock noon (30 degrees vertical angle). In December, the sun rises around 7 AM (60 degrees horizontal angle in plan) and sets at 5PM, at the same azimuth. The sun path is used as a main design



SUNPATH DIAGRAM FOR 36° LATITUDE

Zones of Light

Natural light enters space and creates zones of light, that highlight a particular space or area of activity in the program, at a particular time of the day.

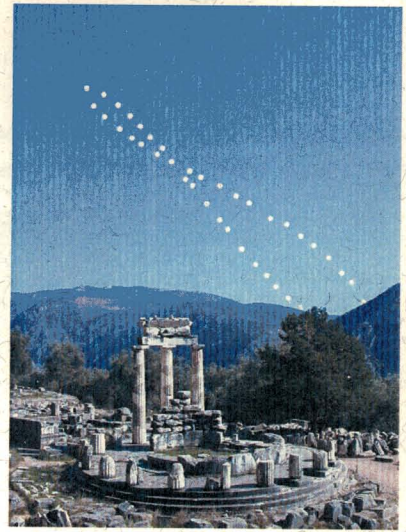


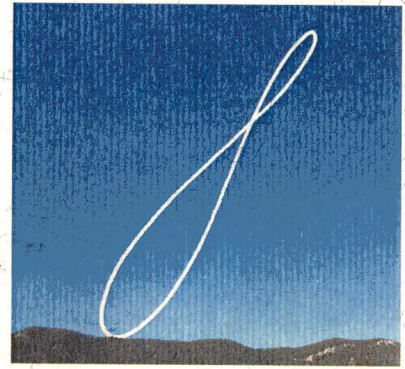
At the time of the religious ceremony, sunlight enters the cathedral space through openings above the altar. Light enters at the time of the ceremony and emphasizes the altar as the focal point of the activity. Light strengthens a hierarchy of spaces, in relation to the main religious program. The hierarchy of space is emphasized not only in terms of symbolism but in relation to the time of the program.

The Figure 8 Analemma

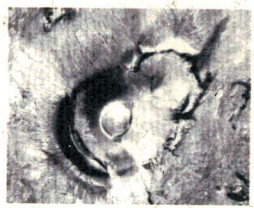
Observations of the sun position at a particular time throughout the year have proven that the sun position does not only change vertically, as in higher or lower, but also horizontally (east and west). Recording the sun position in the sky every day, at the same time, within the same month of the year, or throughout the different seasons, on certain days, the sun position may not be exactly at the position it is expected to be. There are certain shifts that the sun position goes through. Recording the sun positions at one particular day, at one specific time of the day throughout the months of the year, mapping and tracing the positions have produced a figure 8. This produces an equation of "clock time vs. sun time".

An experiment proves this phenomenon. If we place a rod in the earth at a particular spot that receives the light during all the months of the year, the rod casts a shadow on the ground. If we assign the same day of every month, at a particular time and observe the shadow cast by the rod at this time, by placing a shorter rod on the end of the larger rod shadow. The various smaller rods mapped and traced in position form a ribbon like "figure 8".
There are two reasons behind the "figure 8" phenomenon. It is due to the fact that earth rotates around a tilted axis of 23. 5 degrees with regard to its orbital plane around the sun and because the earth orbits around the sun in an ellipse and not a circle

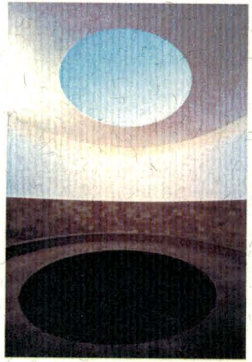




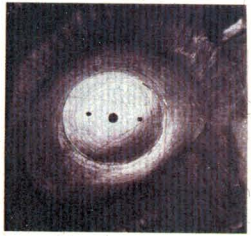
Installations in Light – James Turrell



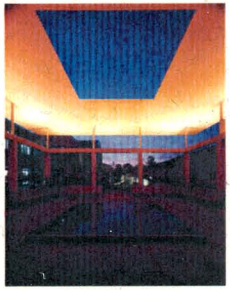
Researching contemporary architectural and installations works related to light, one must acknowledge works by the American land artist James Turrell, and two of his land installation projects: The Roden Crater and the Sky space at Pomona College Museum of Arts, Southern California.



In the Roden Crater project, at the Roden Mountain, Turrell worked on a mountain mass by digging sharply into the mountain, and creating a negative space into which he built his Crater's eye, a space pierced by a circular opening, directed towards the sky. The space is dedicated to the experience of being inside an enclosure, while the space directs the eye towards the opening to the sky which appears visually close to eye that one can touch it. The eye crater is an installation built to experience the light and the sky, at different positions of the sun throughout the day and the year, the perception of the sky becomes different with varying intensities of light outside the space versus the intensity of light inside space.

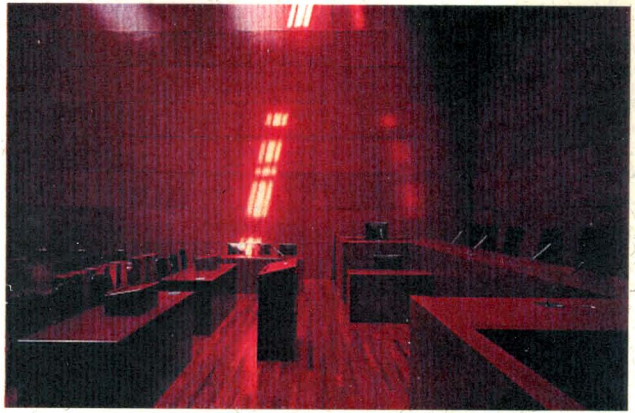


At particular time of the day throughout the year, the opening in the ceiling may frame the sun, or the moon. The color of the sky changes with the change in sun path. The sky is perceived differently throughout the day and during seasonal change, which creates an evolving spatial experience within the crater space.



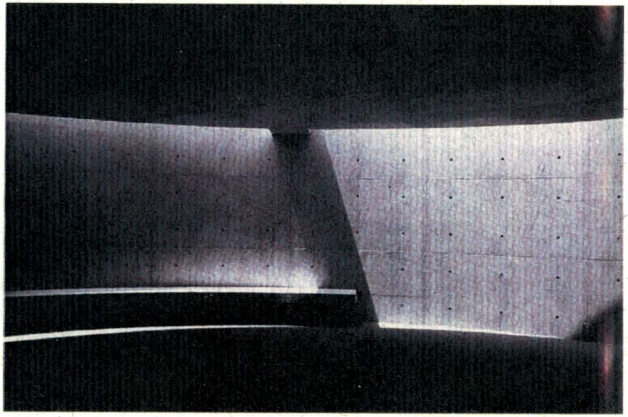
In Turrell's sky space installation, the work is similar in terms of gesture, except that in the Roden Crater, the fact that space is enclosed and installed deep inside the mountain mass, into the negative space, establishes the opening to the sky as the main focal point and the centre of attention by the user in space.

On the other hand, the sky space project experiments with more layers: the changing sunlight, the sky, the evolving color of the sky due to the changing sunlight, the reflective metal canopy, the artificial light projected onto the metal canopy surface and the water surface underneath the metal canopy. Changes in the sun path and intensity of natural light, in parallel with the intentional human-controlled play of artificial light color underneath the reflective metal canopy, and reflections of these elements onto the surface of the water, render the space differently at different times of the day, and users experience various perceptions of a single space. At certain moments, the water surface reflects the landscape scene surrounding the space, at others one perceives the water surface as a transparent layer. Even the sky appears at certain times as a dark void at night, against the white lit metal canopy, and other moments present the sky as a blue gradient appearing visually close to the person underneath the canopy space. This transition in spatial experience inside these two spaces is created by establishing the light as an integral element in space, by creating single openings through which light infiltrates the space, where light is the theme and the major centre of attention. The minimal in size the openings are, more powerful is the light integrity in space, and hence a slight change in sun path would create a visible and felt change in spatial experience inside the space.



In the Palace of Justice by Jean Nouvel, light enters at a certain time of the day into the court space. It highlights the main council's seating area. It emphasizes a hierarchy of space and the time of program.

At a particular time of the day, the natural sunlight hits the bench cast in concrete. The regular bench becomes a surface that reflects a different quality of light onto the walls, at a particular moment in time.



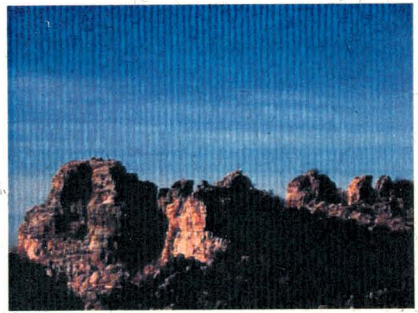
For me, a landscape does since its appearance changes the surrounding atmosphere the air which vary continually.

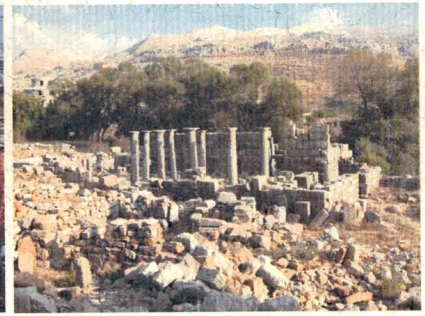
Claude Monet

not exist in its own right,
at every moment; but
brings it to life - the light and

Site Analysis

The selected site is located in Faqra, Kfardebian, a one hour driving distance away from Beirut (North East) and 3.5 km away Faqra Club.



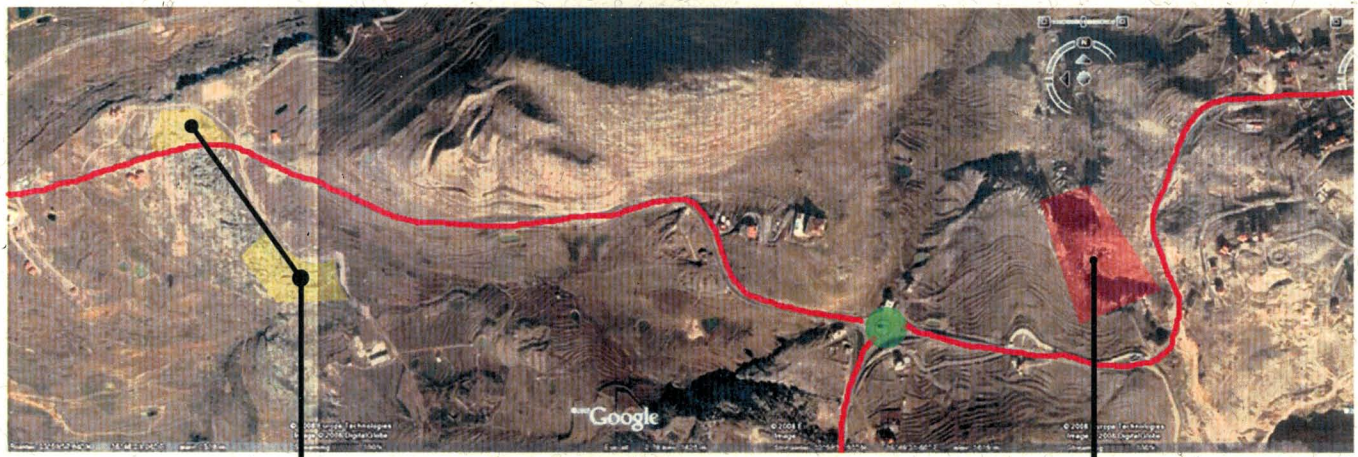


The town of Faqra, approximately 1600 meters above sea level, is part of the Kfardebian region, along with the towns of El- Mzar, Faraya and Oyun El-Semmane. The Kfardebian is region known for its ancient Roman and archeological ruins such as The Great Roman Tower, the Temple of Atargatis, a Roman Sanctuary and the ancient graves in addition to the region's spectacular terrain and natural landscape rich in its unique variety of natural rock formations, mountains, greenery, water resources and snow.

The area is unique in its changing natural landscape. The grain and texture of the area is different in each season. In spring, the terrain adopts a colorful layer of exotic flowers and greenery, in winter, snow covers the area with a layer of white; in summer and fall, the weather is mild and the landscape adopts a yellowish grey cover.

Site Access

The site is reached through the main road leading to the Mzaar slopes. There are no secondary roads or access points leading to the site, since the land is purely natural and free of any infrastructure intervention by the Municipality.



Roman Ruins

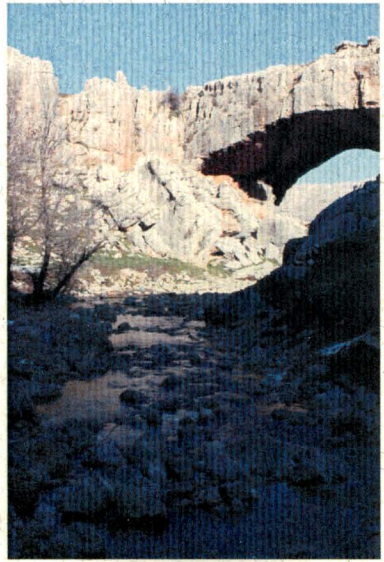
The Site

Site Description

The site at the periphery of a valley. On the site is the natural stone arch (Jisr El-Hajar), a famous landmark in the area.
The natural arch is an attraction to tourists, hikers, rock climbers, site seers and people interested in experiencing nature and documenting landscape scenery. The site includes the natural stone arch and the land around it, which is a natural basin, a negative space, 22 meters deep. Cutting through this negative space, a trace of a small river exists (Nahr El-Laban).

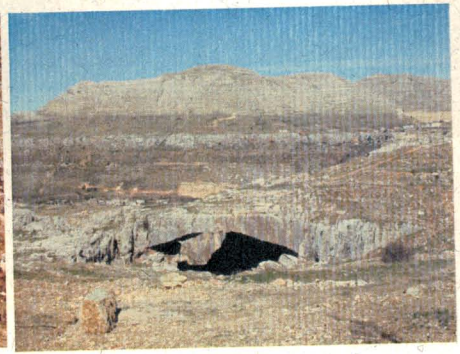
A small river, Nahr El-Laban, flowed out of a natural cavern, within the stone walls of the basin, from the south east. It used to run through the land, passing through and underneath the natural stone bridge, and running into the sloping land towards the valley, north of the site, before the water flow was stopped in year 2005 and re-directed towards vegetation lands in Faqra, for irrigation purposes.

042



During winter, the area is covered by snow which causes a lot of natural rocks containing water throughout the season to break and this leads to the eruption of water springs and rivers that flow from the higher mountains, into a waterfall that runs deep down into the natural cavern. The natural cavern fills with water which floods into the river trace and the small river appears on site mid January till mid April, i.e. during winter and spring when natural flowers start to cover the area with color and greenery. Then, in Mid April, the water flow starts to weaken and in May it starts to dry, leaving back the river trace.

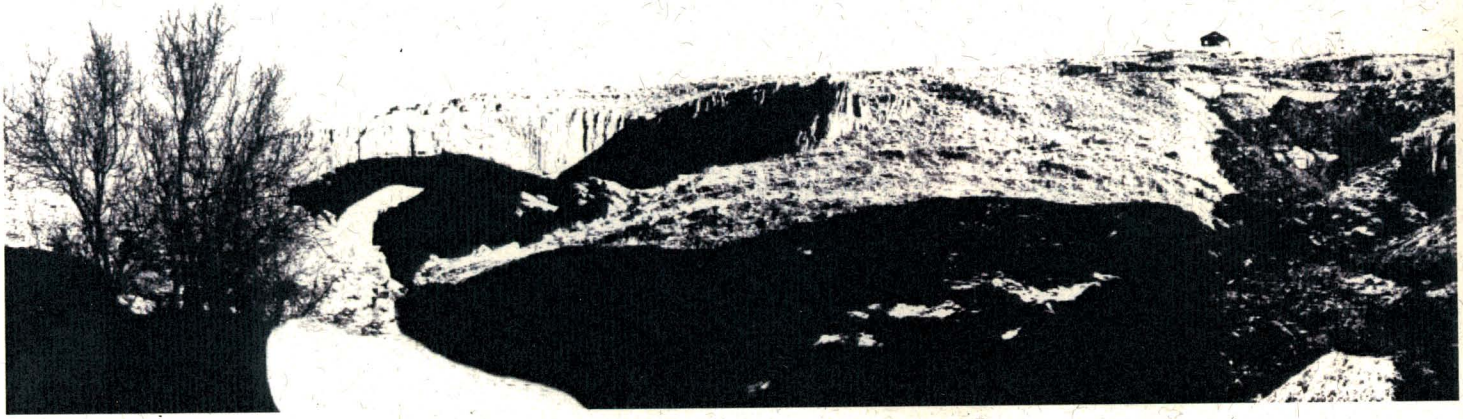
Seasonal Change

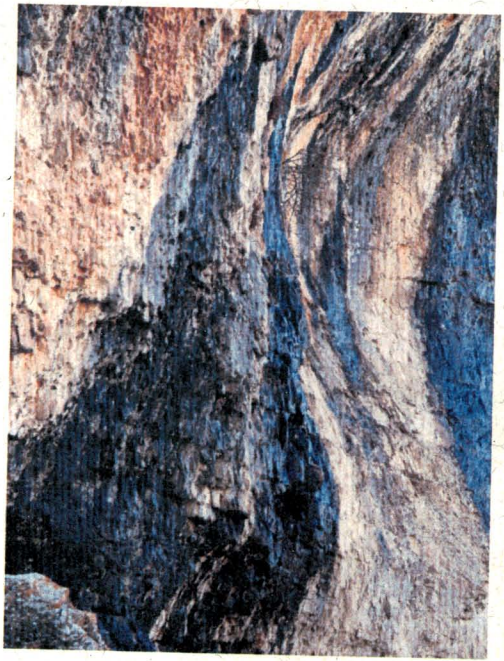


The site is a series of changing natural scenarios throughout the four seasons of the year. It evolves in the presence of natural elements, color, texture, material and surface. During different seasons, it is rendered differently. The site is a land of moments in nature. Temporary and changing moments. Moments that appear and disappear. A landscape of seasonal events created by nature.

Site Observations / Impressions

Visiting the site, the first time, one can observe traces of elements once existing, the trace of the river, traces of deformations in the rocks, walls, and typography, traces of trees and gravel and the main product of natural evolution: the natural stone arch (Jisr El-Hajar).

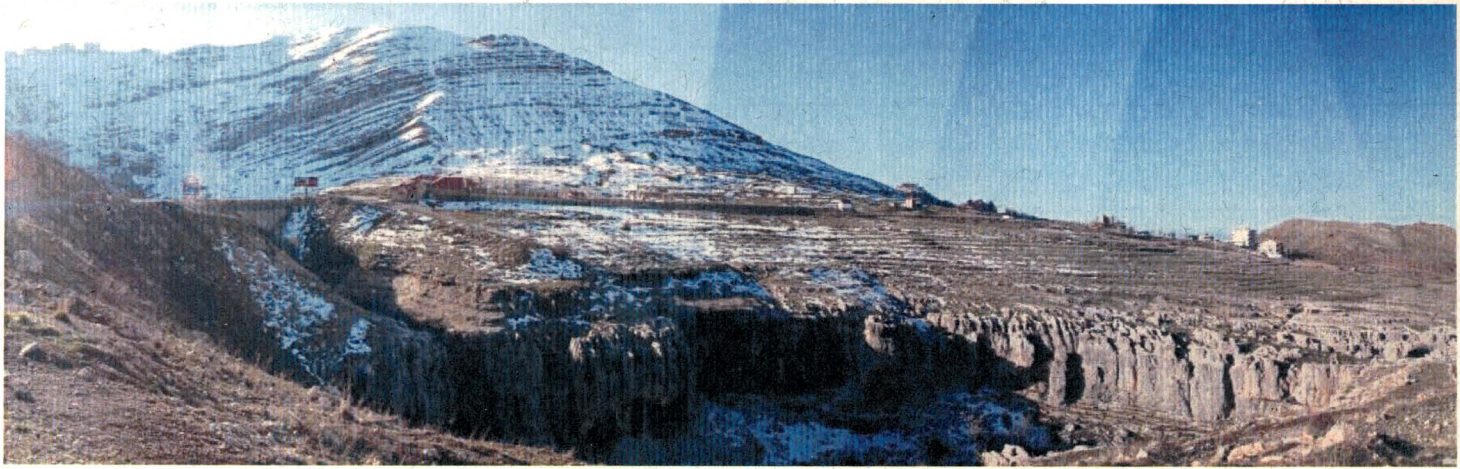




These forms on site are products of pre-existing natural elements that forced the shaping of the site throughout long periods of time. With these pre-existing elements temporarily frozen, the site feels motionless, and being fenced by 22 meter high massive natural stone walls, a steep terrain to the north and east, the site becomes an enclosure.

Encoutering the Site

Reaching the area, and standing at the edge of the site. The site does not appear. It is a buried negative space. As one walks further, the stone walls start to appear slowly and one could feel the large void of the side, surrounded by the high stone walls.



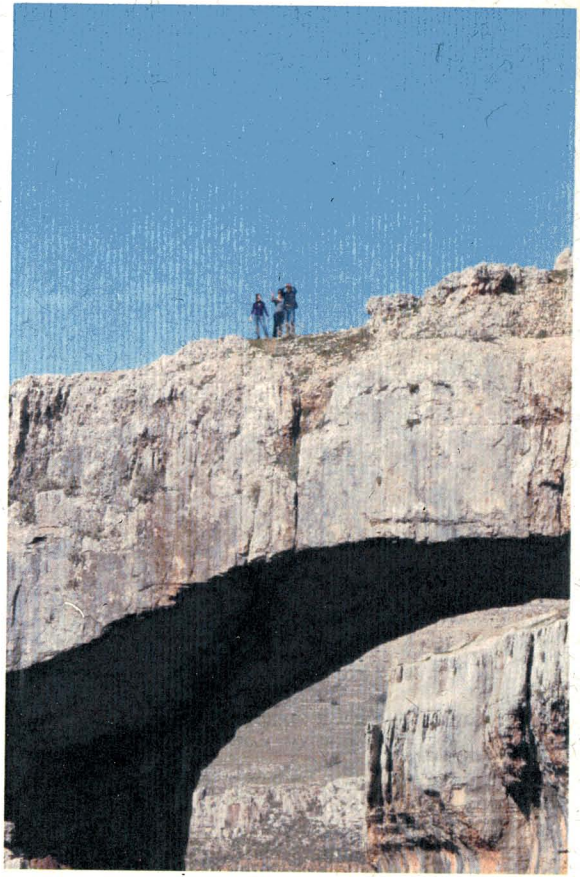
As you walk down the slope, you start to see the cavern and the trace of the river heading to an unknown destination, which makes one curious to walk, to discover the path of the river and its destination.

It is surprising that the natural slope of the land takes you through the experience of discovering the site gradually, as the site curves in typography with the river; your eye follows the river trace, and starts to witness a small part of the arch.

ר

Gradually, you walk through this nature-designed route until you start to see more of the natural arch.

Then, you are in front of the monument, the natural arch, the departure gate of the flowing river.

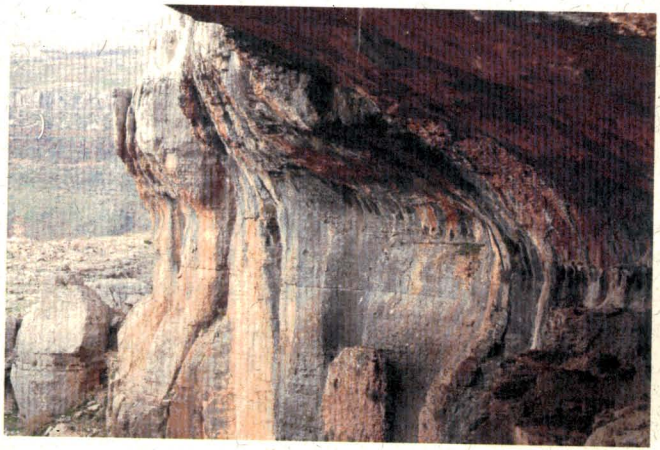


The Natural Arch

The natural stone arch/bridge on site is massive in scale. The value of the arch, being a point of perforation to the site, and its significance as a natural formation through long periods of time and change, which the site has been through, makes it an important element to acknowledge.

Standing underneath the arch, is a spectacular experience on its own. The experience of being inside a natural spacious vault, where the sun projected powerful tonalities of light and shadow onto the deformed natural rock surface, with the unique form of the reddish grey rocks casting shadows against the light, producing a gradient of color and texture.

This scene produced by the light and scale of the arch is somehow terrifying and magnificent for the scale of the human. It is a feeling which is born out of relationship of human scale to the scale of the arch and the site, and the fact that such overwhelming creation is a product of nature alone, and free of any human intervention.

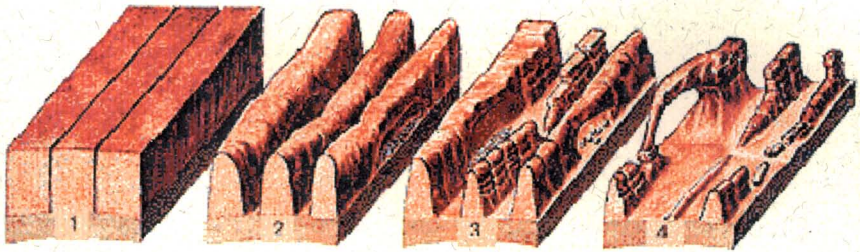


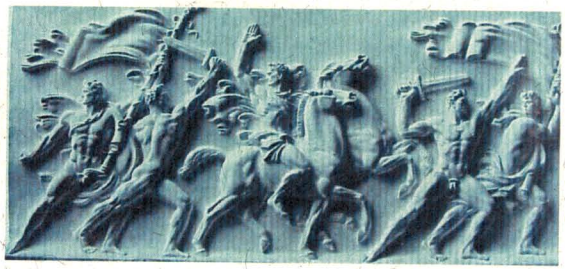
Researching the Monument

The arch is the main landmark on site and the project is to acknowledge it in the design. It was important to research into certain types of arches and the symbolism of the arch in history.

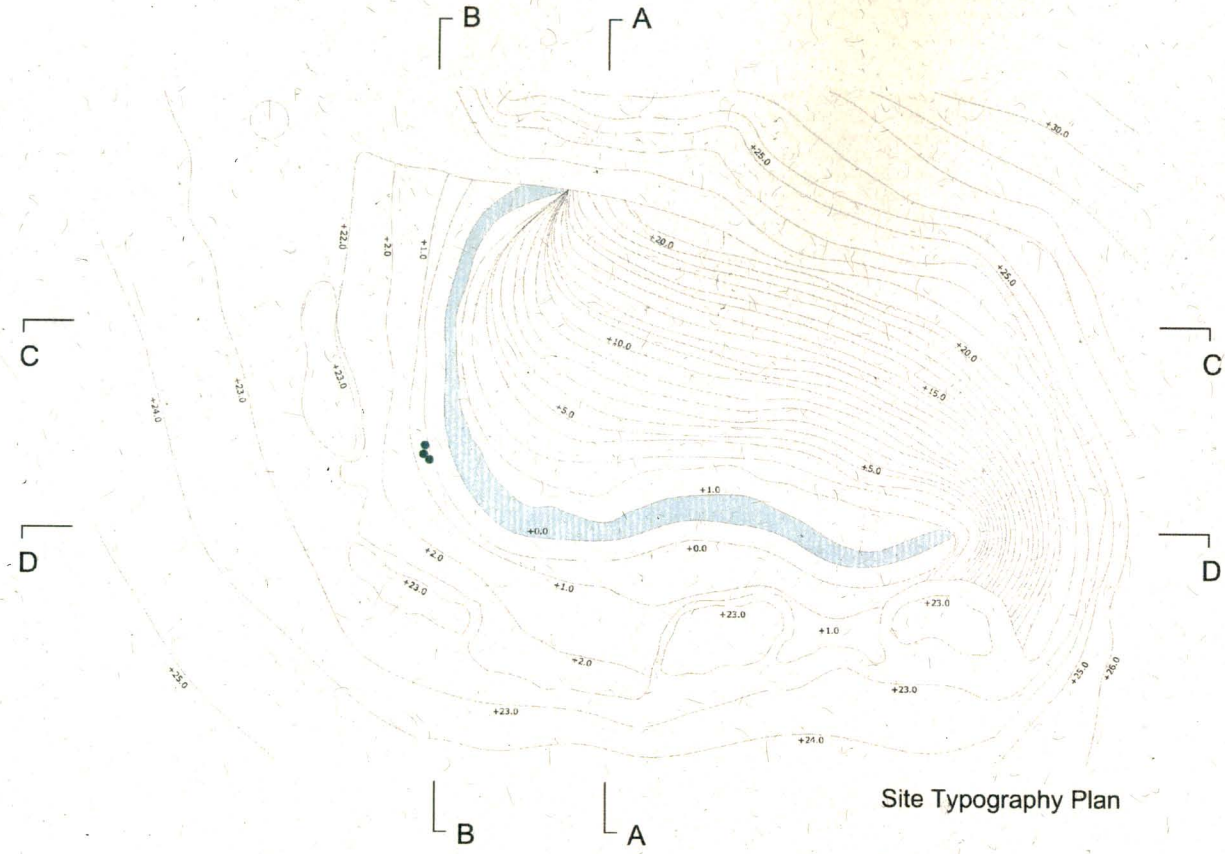
Natural arches are spontaneous creations of nature. They are formed by natural erosions in the weak strata of rocks in
the earth terrain, caused by the flow of wind and water pressure. The process of erosion in the layers of the rocks takes place throughout long periods of time, which could go up to centuries. Deformation and change is gradual, but in the very long run.

The notion of the arch as point of perforation and transition between two zones at the site, and a medium through which, the creator of the arch, the river, passes underneath it, towards the valley, the lower lands, is a point of spatial intervention within the envisioned project.



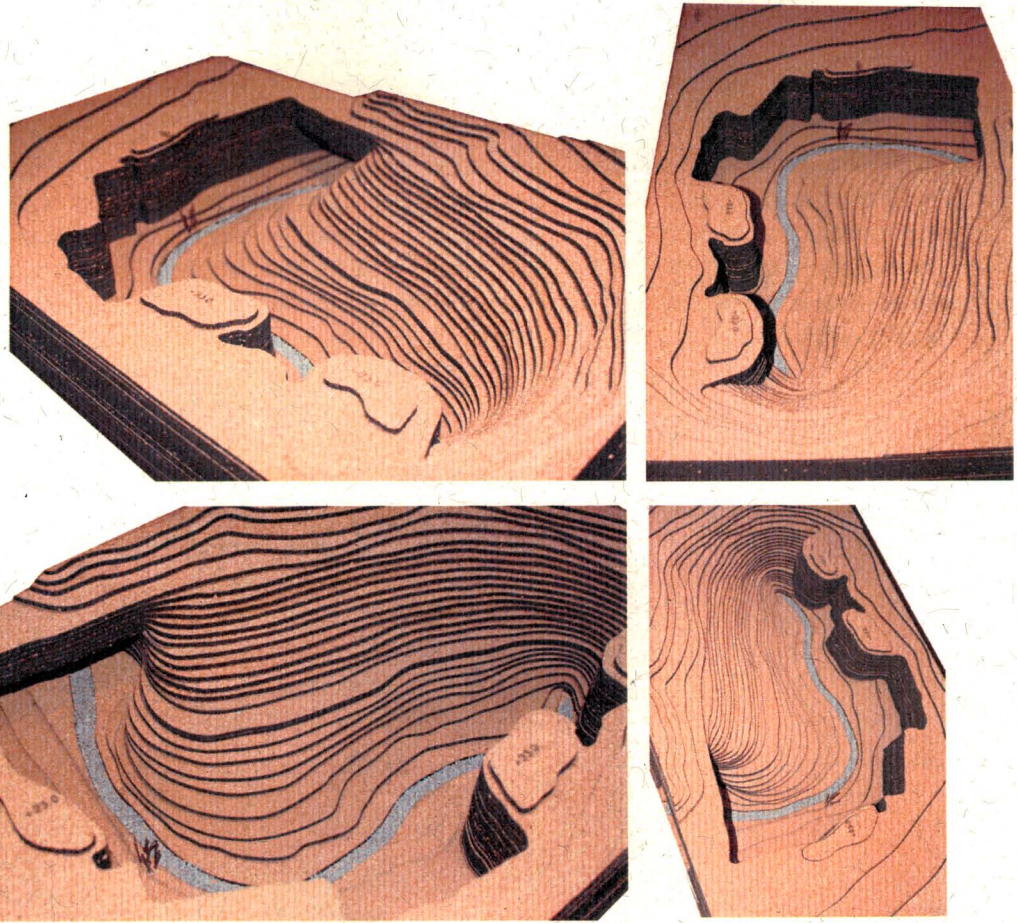


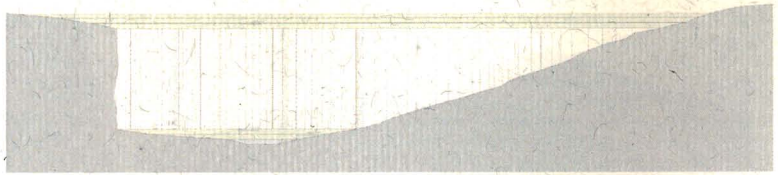
Besides the historical invention and the use of the arch as a mean of structural support before the invention and use of steel and concrete structures, and the arch structural system of barrel vaults evolving into various types throughout history, what is interesting is the symbolic use of the arch in history by the Romans, as triumphal arches, where the arch was a gate in the city, and the point of departure and arrival to and from victorious battles. It was believed that the arch was a transitional space which celebrated victory of the returning troops and purified the warriors from blood and the sins of killing in battle.



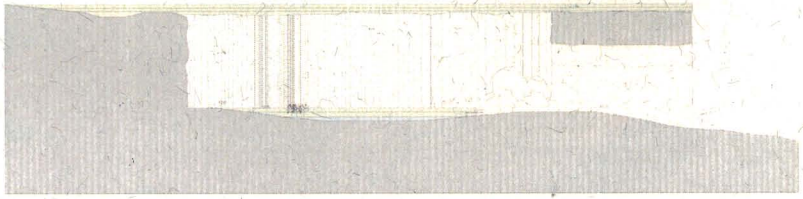
Site Typography Plan

Site Model





Section A - A



Section B - B

Section C - C

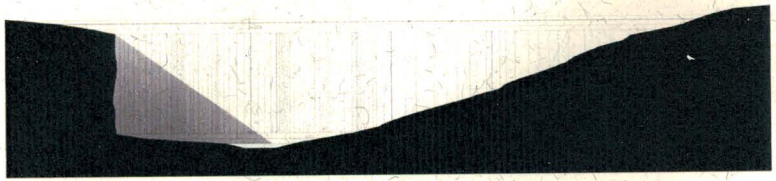
Section D - D

Sunlight Light Exposure

The sun light scenario on site is unique and particular to its typology. The site is not fully exposed to light. The massive stone walls cast their shade onto the bottom of the site. Certain areas of the site receive the light at particular times of the day; others are shaded, and then lit at others. The site receives and gets exposed to light differently throughout the day and this exposure varies during months of the year. (See light-shade analysis cross sections).

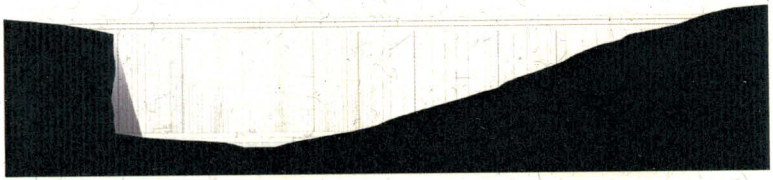
Around **8 AM** in the morning, parts of the hill, which dissolves into the bottom of the site, start to receive sunlight gradually. The trace of the river and the trees on site at this time are shaded. With the change in sun path, between **9 AM** and **10 AM**, the trees start to receive light gradually with the river, and the water starts to reflect the light onto the surface of the banks and rocks. The natural cavern, from which the water flows, starts to receive sunlight gradually in the morning as the sun changes position, and it starts to glow with light slowly, in the distance.

At noon, the site is mostly lit by the sun, which starts to shade the area in front of the arch around 4 pm and 5 pm in the afternoon. During the changes in sun path and light exposure on site, the play of light and shadow against the rocks surface evolves inside the natural arch space.



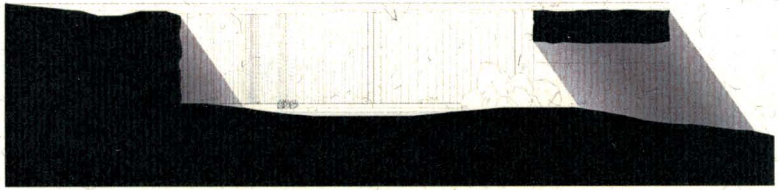
Section A - A Sunpath (January) - 12 noon

Section A - A Sunpath (March) - 12 noon

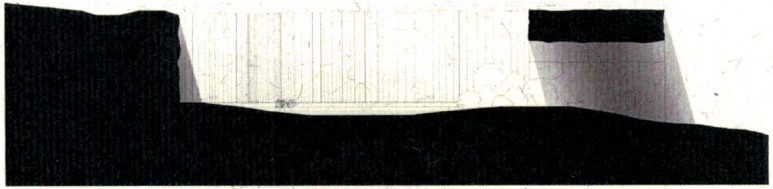


Section A - A Sunpath (May) - 12 noon

Section B - B Sunpath (January) - 12 noon



Section B - B Sunpath (March) - 12 noon



Section B - B Sunpath (May) - 12 noon

Section C - C Sunpath (March) - 6 AM

Section C - C Sunpath (May) - 8 AM

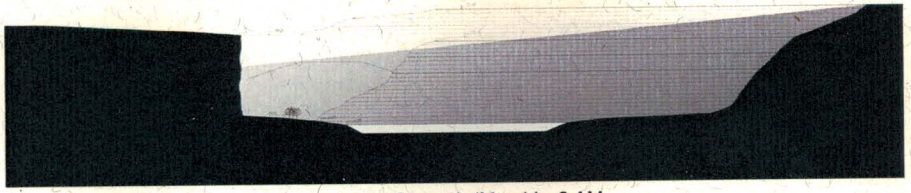
Section C - C Sunpath (August) - 7 AM

Section C - C Sunpath (March) - 6 PM

Section C - C Sunpath (May) - 4 PM

Section C - C Sunpath (August) - 5 PM

I intend to have this aspect of partial sun-light exposure and light vs. shade, on site since I envision an architectural space that is "biased" in terms of light vs. shade, where light is not uniform all over the site, where particular parts of the space would receive different intensities of natural light and shade at particular times of the day, during the change in positions of the sun, which would help enhance the user's perception of time in space, and create spatial moments in light and surface.



Section D - D

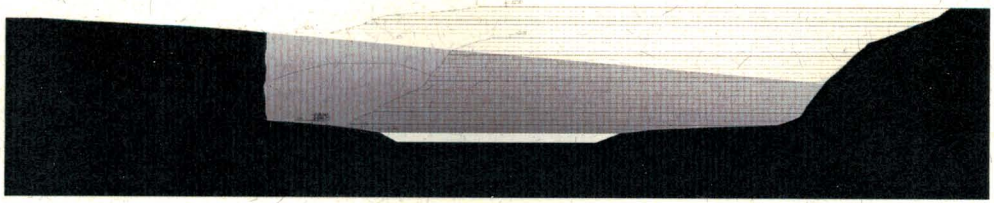
Sunpath (March) - 6 AM

Section D - D

Sunpath (May) - 8 AM

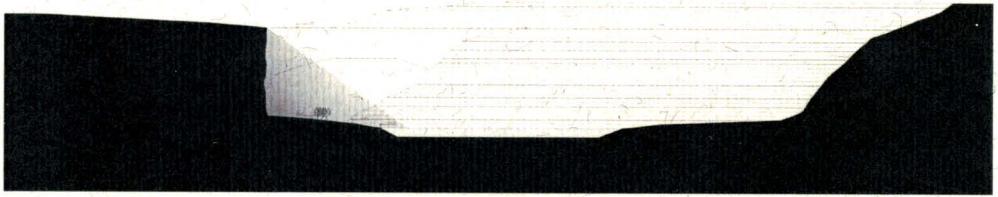
Section D - D

Sunpath (August) - 7 AM



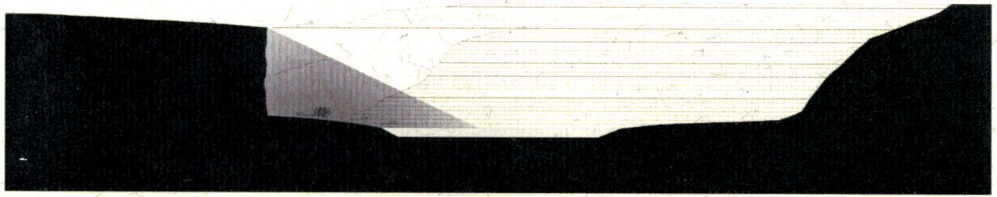
Section D - D

Sunpath (March) - 6 PM



Section D - D

Sunpath (May) - 4 PM



Section D - D

Sunpath (August) - 5 PM

Light is a powerful substance.
But, for something so powerful,
are fragile ... I like to work with it so
you feel the presence of light
employ sunlight, moonlight and

We have a primal connection to it. situations for its felt presence that you feel it physically, so inhabiting a space... I wanted to starlight to empower a work of art.

James Turrell

Investigating Surfaces

When the curious pioneer has made the attempt to discover the mystery of creation, and what a simple glass prism could do, the light has revealed another world inside the object.

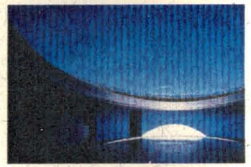
Materials and surfaces posses both physical and chemical properties. The impact of these material aspects on space and their potential to create spatial moments are revealed by the light upon its interaction with surfaces and objects in space.

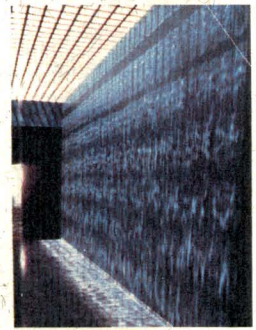
Investigation into surfaces involved research into a number of materials which possessed certain interactive qualities with natural light. The process included experimenting with a number of materials in combination with natural materials on site such as the natural rocks, the trees, and the water from the river, and the snow under the exposure to sunlight over the site in Faqra.

Water

Water surface acts like a lens which reflects and refracts natural sun light, depending on the motion of water particles and the ripples of water. The greater the motion and ripples, the more the reflections of natural light by water particles, which projects light rhythms and textures onto walls in space the moment light strikes the water surface. Subtle water surface tends to refract the light more and reflect a clear symmetrical image of the natural landscape and the building on site.

Water in space and around space changes in color, due to the change in the intensity of light and shadow during the day. It reflects the changing color of sky throughout the day and the different seasons onto the surroundings. The space is rendered differently in the morning, from the evening, according to the position of the sun and the angle of sunlight hitting reaching the site.

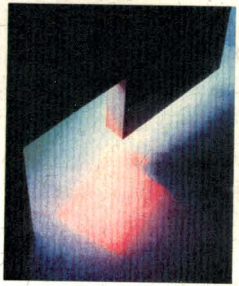


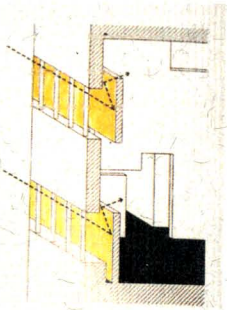


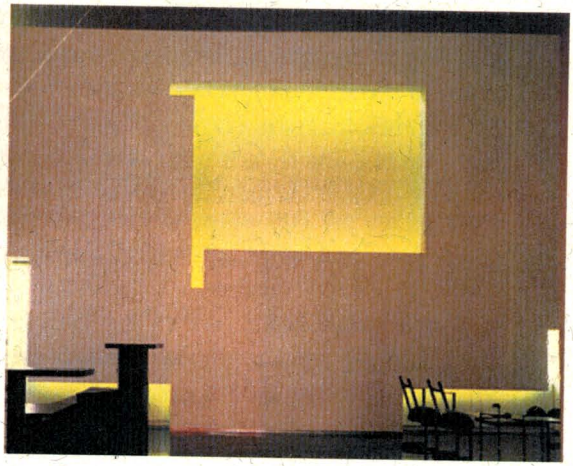
Experimenting with water on site involved application of materials such as white paper sheet close to the water surface on site, under sunlight exposure, which yielded beautiful light textures onto the white paper surface. Playing with paper and bending it into curved surfaces produced certain degradations of light and shadow on the bent paper, from bright white to off-white, light grey and darker tonalities on the paper surface.

Experimentation involved application of colored red plexi-glass over the water. The light passing through the semi-translucent red plastic onto the water surface which changed the water color visually into red, both on its surface and underneath the water.
The red semi-translucent plastic has an aspect of partially reflecting the light partially letting it pass through. When the sunlight hits its surface, the exposed side reflects the light and an image of the surroundings, hence it acts like a mirror dipped in red, and at the back side it colors the light and projects red color onto the water and the earth. Placing the red semi-translucent plastic surface vertically on the snow covered earth; it mirrors an image of the landscape in red. This surface could have various colors.
Going beyond the level of manipulating the spatial color with light, through the use of a colored transparent or translucent medium such as plastic or glass, planes within the skin or envelope could render the space in various color tonalities through the reflection of light. One of the relevant architectural case studies is the exhibition space designed by Steven Holl, where he covered the openings by colored planes of concrete that protrude outside the frame of the window by 20 cms and light enters sharply but indirectly into the space, as it gets reflected by the colored concrete planes from outside to inside.

The reflection of light from the colored planes also reflects color into the space. Parts of the space are yellow and others are green and purple. The intensity and energy of the color depends on the position of the sun in relation to the colored planes. Hence, certain parts of the space interior receive the color at particular times of the day, where the colored planes are exposed to the sun, others which do not receive the light, eventually do not reflect color at this particular moment, while some are rendered with lower tonalities



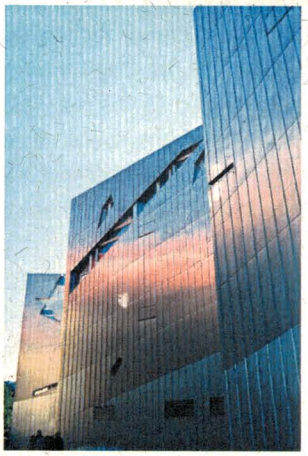


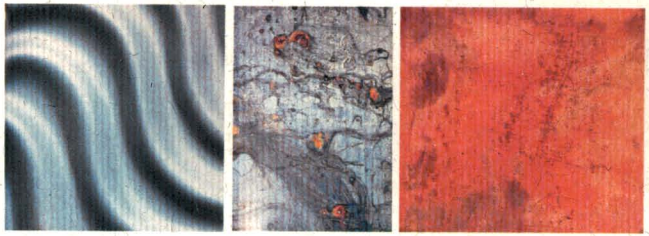


Metal

Metallic surfaces (Tin, lead, stainless steel and aluminum) on interaction with different intensities of natural light during the day and throughout the seasons, exhibit different properties. Depending on the angle of sun light, their reflective surfaces of films, and coatings reflect natural light at different times of the day, and changes color, hence it enhances the perception of sunlight changes and time inside and outside space.

Looking at buildings with metallic skins such as the Jewish Museum designed by Daniel Libeskind in Berlin. In the morning around 10 AM, the metallic skin surface reflects sunlight in high intensity. The surface is appears silver shiny, whereas, at dusk, due to the intensity of sunlight, angle of the sun and color of the sky, the metallic surface turns reddish orange.



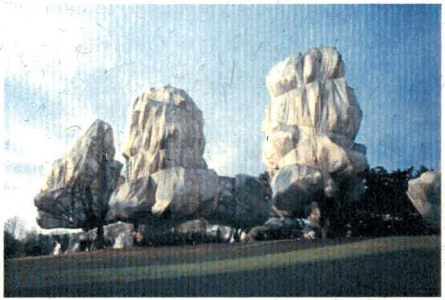


The metal surface appears differently in the morning from the afternoon.

The reflectivity of the metal evolves and skin changes in color depending on sunlight.
Reflective metals would reflect natural light and project these reflections differently onto the water and the natural stone walls of the site at certain times during the day.

Under climatic conditions in time, metal surfaces such as iron, weathering steel and copper change chemical properties, color, texture and surface, in a process of oxidation and aging. Steel rusts into reddish brown, orange and green. Copper surfaces age into a green surface. In the long run, through time, the building on site is perceived differently as it evolves in terms of material surface and texture.

Fabrics



To investigate into the effect of sun light on fabrics, one must refer to the installation works by land artists Christo and Jean-Claude. Christo and Jean-Claude have attempted to intervene on objects and masses in nature. Their large-scale interventions were executed on mountains, terrains, rivers and trees, and the work mainly involved the concept of wrapping these natural objects with various types of fabrics. Christo and Jean-Claude tend to elevate objects in nature to a higher level of interpretation, which emphasizes their essence and aspects of natural form under the effect of natural light.

What is significant in the works of Christo and Jean-Claude is the use of fabrics and the effect of natural light on the «post-wrapping» form of natural elements in space, where the relationship of light vs. shadow is most prominent in terms of degradation of light and shadow tonalities on the surface of fabric.

The work is also remarkable in terms of expressing the perceptional change in certain materials. In the Berower Park project, Christo and Jean-Claude intervene on a number of trees by wrapping them with woven polyester fabric, which partially reflects and partially lets the light through. During the day, before noon, the fabric surrounding the trees reflects the light and shines in the middle of the landscape, whereas in the afternoon, when the sun hides behind the trees, sun light filters through the fabric which possesses partial transparency, and exposes the tree and its structure inside the fabric. Under certain angles of light and times of the day, one views a tree as a three dimensional wrapped object and at other moments, the installation appears like an x-ray image where the tree is exposed as a dark figure against the sun in the horizon. A tree evolves visually at different moments in light, governed by the changing position of the sun at each moment.

Glass

Dichroic glass changes color during the course of the day and as one walks past it, depending on the angle of view and the angle of incidence of light. Some light rays are transmitted and others are reflected by the glass. The change in color throughout the day is due to the presence of film coatings inside the glass, that split light into its basic chromatic elements.

The greater the irregularities in the form of glass, the greater the refractions of light by the glass. Irregularities within the form of "Sagging ice" blown glass, projects flickering light textures onto the wall when light hits the surface.

Creating an irregular form out of glass, by packing up rounded light bulbs together creates multiple reflections and refractions of light inside the glass bulbs, which produces fragmented light textures on the floor and the walls as sun light filters through it. This experimentation has been used by the the firm GMP Architekten in designing the skin for the Christ pavilion.



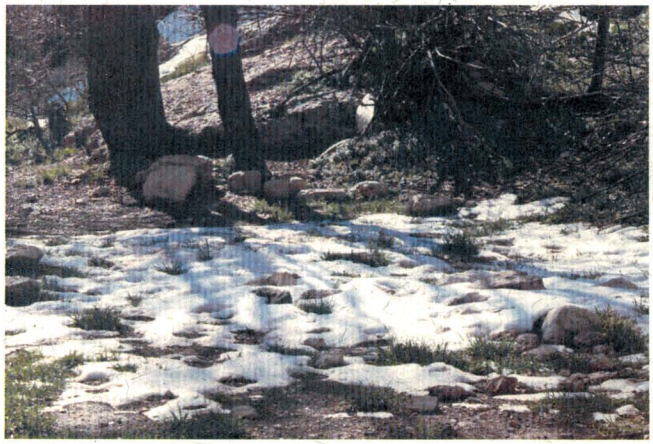


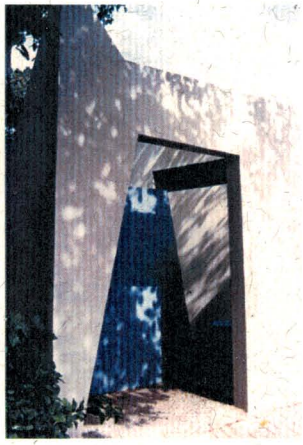
Snow

In winter season, snow covers the earth like a white sheath. The white color of snow is a good reflector of sun light. Shadows appear differently on snow. Shadows range from dark grey to lighter grey tonalities, depending on the surface. When shadows are cast on the surface of snow at noon, they appear blue. In the afternoon and around dusk, when the sun starts to set and the sky turns yellow orange color, snow reflects sun light in the afternoon and the color of the sky. The blue shadows start to appear green.

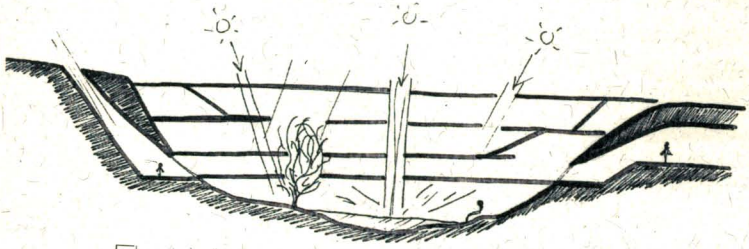
A Tree

It is fascinating what a basic natural object in nature, like a tree, can create as the sun sheds its light on it. A tree, of roots, branches and leaves, waves with the wind, and when sun light strikes the tree at a particular time of the day, its shadow vibrates and waves with the flow of the wind; a shadow interrupted by fragments of light filtering in between the leaves and branches, and when the shadow of a tree is cast over a surface of snow and the rippling surface of water from the river, it produces an eclectic complexity of light and shadow relationships in motion, belonging to the multiple natural layers on site.



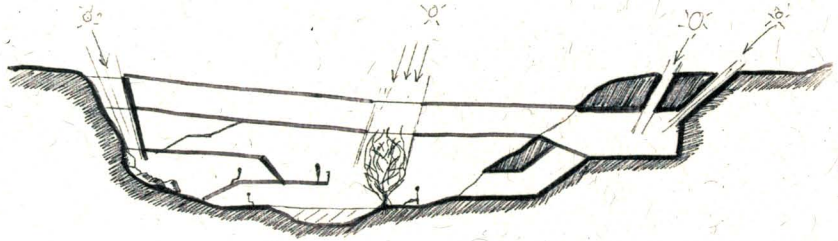


Design Vision



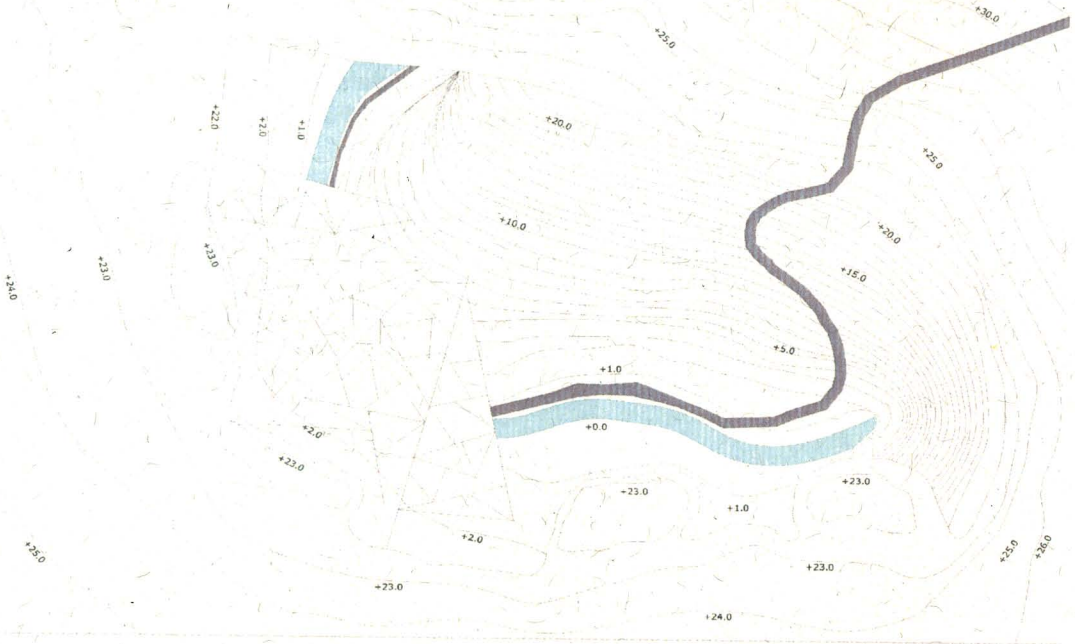
First Vision A **&** B

The envisioned space celebrates the sunlight. A space of moments. Light creates moments when it interacts with surfaces inside the space at different times of the day, and particular times of the year. These moments of light and shadow, colors, textures and reflections of sunlight by the water, onto the space, announce the engagement in activity, and the beginning of program in each space under the light, under the changing path of the sun.

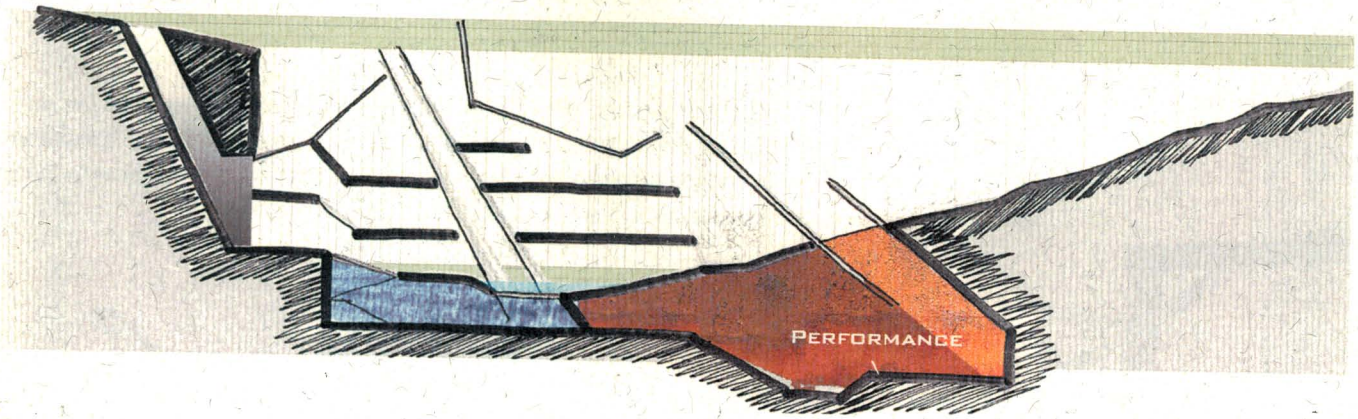


The space is envisioned to sit above the water. It is slightly elevated over the water; one of the natural layers on site which paints the scene with light and reflections at certain moments, when light projects onto its surface. The space is pierced to infiltrate light onto the trees. It surrounds the trees that cast their shadows onto the ground surface of the earth, stones and water. Users walk into the space, and when they enter, they walk over the earth and the rocks. The ground has no artificial paving. Users are inside an enclosure. They sit on the rocks and the pure earth, in front of the water and the trees around them. They observe the light cutting through the space and interacting with material. The space is both inside and outside. An experience of light and nature inside an enclosure.

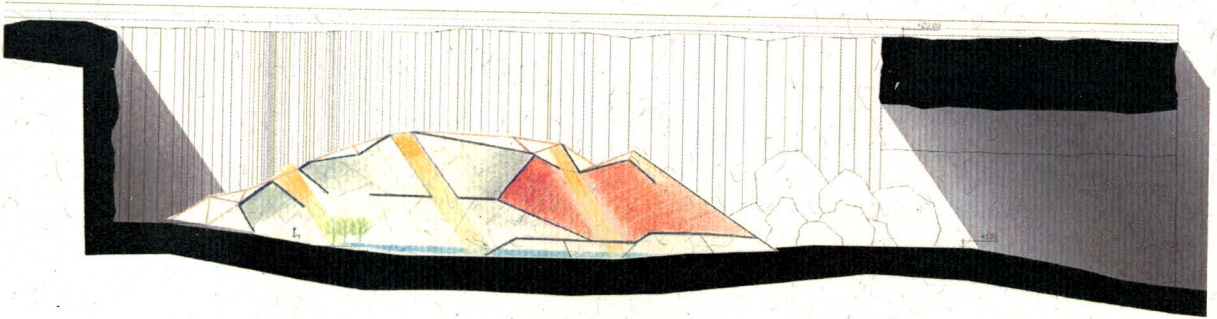
The envisioned space is accessed through a route, which takes the users through a gradual encounter of the site, starting from the source of the river flow, moving in parallel with the river trace, and gradually experiencing the vision of the natural arch in the distance, as they approach it, going through space, inside and outside, encountering various heights, of the sky and the space, during the experience of walking through the site.



Second Vision

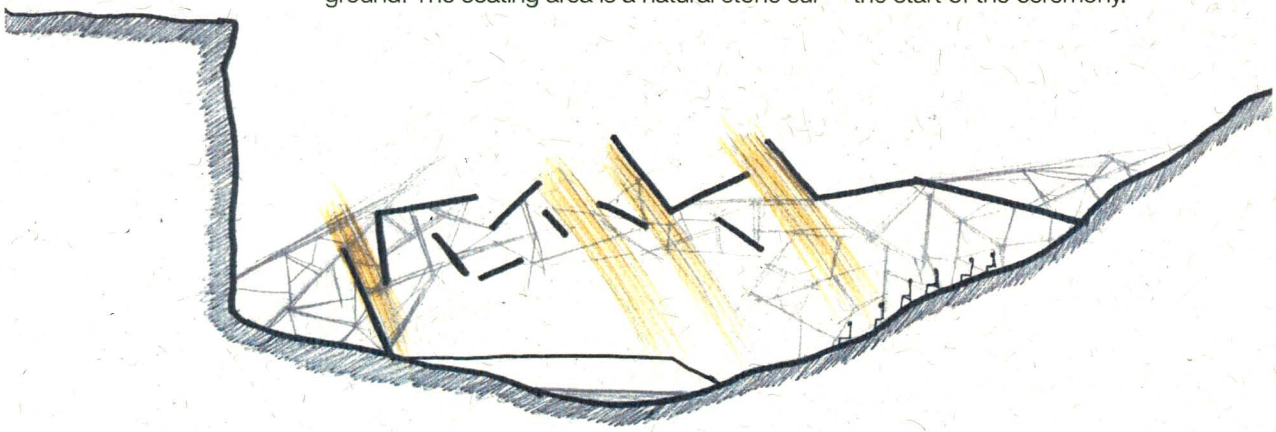


Third Vision



Fourth Vision A

At 12 noon in March, sunlight enters the performance space at an angle of 55 degrees. It lights over the seating area and the stage background. The seating area is a natural stone surface. The light projects shadows onto the surface of the earthy rocks. The light emphasizes the two zones of the performance space upon the start of the ceremony.



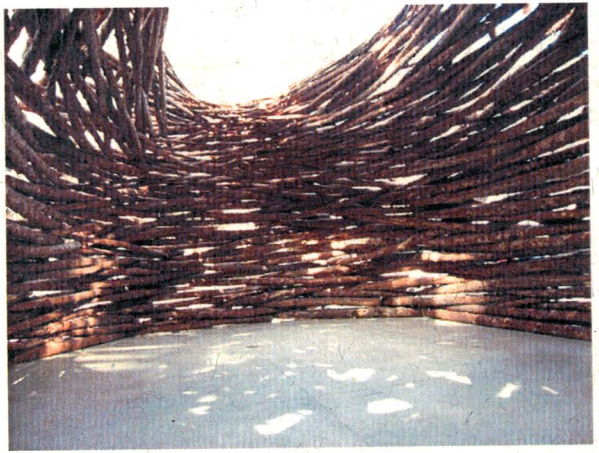
Fourth Vision B

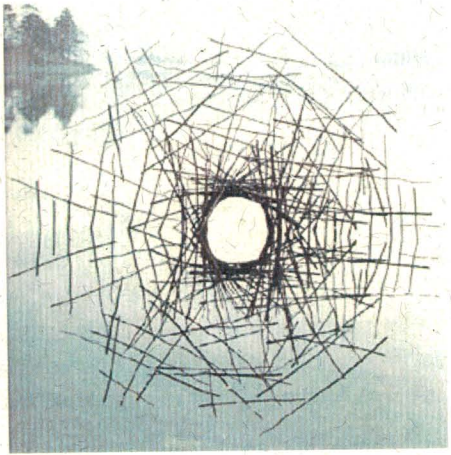
At 3 PM, light enters at 35 degrees; it hits certain surfaces of the reflective metallic skin, which reflects the light further to other planes within the skin. The surfaces reflect the light in different directions. Fragments of the light spread over the stage and the space, during the performance.

The space is sensitive to the natural typology of the site. It imposes minimal building prints and foundations into the earth. It does not heavily alter or deform the site. The space is envisioned to be a light structure; a structure that blends with the site, the trees, and the rocks. It feels weightless like the branches of the tree.

It was vital to research into certain structures that are sensitive to the natural context. The research looked into case studies of land art and earth installations by Andy Goldsworthy. In his work, Goldsworthy intervened on natural contexts by designing installations in nature. These installations deal with natural surfaces and the use of sun light. They are sensitive to nature through the use of elements and materials existing in nature, such as tree branches, stones, gravel, earth, etc. and the way these works are installed in nature. They blend effectively with the context . The man-made installation appears as a spontaneous piece created by nature.

.

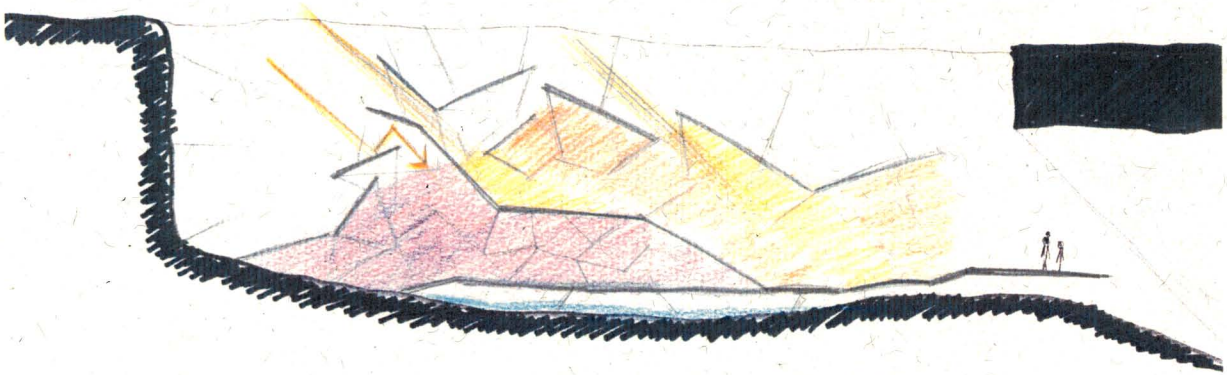




The envisioned project uses a light structural system of steel members and tensile cables fixed at definite points in the ground. Tensile cables are attached to the stone walls of the site. The skin consists of reflective metal sheets that are supported partially by steel members and partially by the tensile cables. This system allows for large structural spans, imposes minimal footings on site and enables the skin to adopt different at different angles that adapt to the sun path. It allows to the building to pack and unpack itself flexibly. The light system of tension cables would vibrate slightly with the wind flow. The skin shimmers with the wind, creating motion in light reflections.

Fifth Vision

The project allows users to experience the space beneath the arch as it creates circulation towards the arch space. Certain planes within the skin open to the outside and create light platforms that allow users to walk on them, towards the natural vaulted space. It allows users to engage with the space beneath the arch.



The skin of the space is made of reflective metal and glass. It possesses an aspect of changing color gradient with the change in sunlight conditions. The skin reflects sunlight at certain angles, and projects light reflections onto the stone walls of the site. The massive stone walls are used as projection walls. Light and color projections onto the stone walls create multiple layers of light, color, shadow and rock texture. It dissolves the rigidity of these walls on site.

At night, the stone walls of the site are used for projection of images and visuals.

Program

Inside the envisioned project, light is the main theme in space. The space revolves around certain moments in time and the sun path. It is an architectural installation which celebrates light, shadow and surface. The building is specific to the site and created according to the path of light.

In terms of how the space behaves with light, It is a contemporary re-interpretation of the monument, the ruin; the sundial under the sun. However, it is not a tool that defines the time for the purpose of knowing. The intention here is to experience what light can produce in space and perceive time through an evolving spatial experience; for the sake of the experience.

I think of a program, but I tend to refrain from attaching the space to a formal function or a fixed programmatic use . I emphasize a point: It is a space in nature, not a "nature center". It is a space for meditation, not a "health center". It is a space for celebrating in nature, not a recreation hall.

It is a space where different user groups in the area: tourists, skiers, hikers, rock climbers and the local community visit to experience the light, in the middle of nature. Hence, I envision the building as pavilion that affords to contain a variety of spatial programs, from exhibiting, to performance, to meditation. Hence, it is a flexible space that is not created for the sake of a regular function, but it could be flexibly adapted to a program, because light is about performance, is about solitude in space and light is about exhibition.

The space on this particular site, with unique natural qualities and light aspects, revolves around the light. The main program is observing the light, and experiencing the space as it evolves under the changing sun path. The envisioned space is a pavilion designed to experience the light, regardless to how each user adapts to this experience.

Stake Holders

The Municipality of Kfardebian & Ministry of Tourism

The spatial programs and land use in Kfardebian is managed and operated by several actors and agents in the area. It is important to highlight the nature of stakeholders in relation to the programs within the context of the site.
The municipality of Kfardebian provides, manages and operates the infrastructure and public facilities for the local community. The municipality of Kfardebian has constituted an elected Tourism and Information Committee which supervises and funds touristic programs and facilities in Kfardebian as well as preserves the natural sites existing in the region, including the Natural Stone Arch Site of Faqra (Jisr El-Hajar).

The Tourism and Information Committee is mainly funded by the Lebanese Ministry of Tourism.
The Tourism and Information Committee raises touristic and preservation projects to the Kfardebian Municipality general administration, which studies the proposals, approves on them and forwards the project and fundraising proposals to the Lebanese Ministry of Tourism and potential investors.

The Faqra Club

Faqra Club is a public limited establishment, started in year 1976, which bought a large area (10%) of Faqra in the Kfardebian region divided the land into parcels and offered the lots for sale and exploitation.

The Faqra Country Club offers a large scale residential and touristic complex which also contains real-estate lots for sale and construction investment, private high-end residential villas, commercial programs and entertainment facilities like the «Faqra Club Hotel» (5 star hotel), restaurants such as «People Restaurant», health centers, recreation and multipurpose halls and outdoor spaces. The residential properties are bought and owned by upper income groups due to the high land price (400-1500$/sqm). The Faqra Club has formulated its own zoning and building codes as a standard for its area.

The Faqra Club is offered to and accessed by the general public who visit the complex during the different seasons for the various available entertainment facilities and recreation activities that take place there, such as: open air markets, exhibitions, fairs, art display and expositions, festivals, concerts, etc.

Mzaar **2000**

Is a tourist resort, owned by a public limited establishment founded in year 1993. The public limited establishment is owned by a board of shareholders who invest and buy shares in the firm. Mzaar 2000 offers residential facilities including chalets, and the Intercontinental Mzaar Hotel (5 star). It also offers commercial shops, recreation and multipurpose halls for festivals and concerts, in addition to it being located next to the ski slopes, which is a strategic point of attraction for tourists and skiers.

Private Owners / Businesses

95%Tourist resorts, restaurants, cafes, shops, hotels, motels, and chalets are owned by private investors, who either reside in Beirut, or outside Lebanon and they assign local hosts to manage, run and cater their facilities to the public.

Private residential properties are owned privately by people who purchase them as read-

ily built apartments and villas, or buy land to construct residential properties on them. These are normally used by their owners as seasonal and occasional / temporary residences, on holidays, weekends and in winter when the skiing season is high, and in Spring and summer when the weather is favorable , a variety of other activities open up in the area, and visitors escape the hot weather and dense traffic in Beirut and seek the area for sightseeing and the different tourist activities offered.

The local community

5% of the tourist facilities are family owned and run by local families of Kfardebian or members of the local community, who reside in Kfardebian. These facilities are either located in the central villages of Kfardebian or around skiing slopes and touristic attractions, to cater for visitors and tourists who come from several locations in Lebanon, or from foreign countries to visit the area for skiing and snow-related activities.
The local community residing in villages of the Kfardebian region (12000 ppl) engage in several occupational activities, especially production such as farming / fruit and vegetable production, rock extraction for construction, where Kfardebian is rich in natural rock type variety, commercial activities such as small shops, cafes, and restaurants. Part of the community works in running the touristic facilities owned by the Lebanese Ministry of tourism, such as the archaeological and Roman ruin sites.

Stakeholder Analysis

The Municipality of Kfardebian **&** Ministry of Tourism

The selected site (Jisr El-Hajar) has been enlisted by the Lebanese Ministry of Tourism as a significant point of tourist attraction, it being a purely natural land containing a unique landmark which is the natural stone arch.
The site is not part of the Faqra Club establishment or the Mzaar 2000, neither in terms of ownership nor in terms of land parcellization. It is a natural site owned by the Ministry of Tourism, which has delegated the regional supervision over the Natural Arch site (Jisr El-Hajar) to the Municipality of Kfardebian.
Both the Ministry of Tourism and the Municipality of Kfardebian are concerned about establishing the site and its landmark as an important point of attraction. They are also interested in an intervention which does not heavily alter the natural and ecological aspects of the site. They are interested in a project which fulfills the mentioned goals of program but sustains the natural aspects site at the same time. The Ministry of Tourism and the Municipality of Kfardebian are the two major players in the area, and decisions over a design intervention on the site are made by the two, first the proposal has to pass through the Municipality of Kfardebian, then through the Ministry of Tourism.

After having proposed the envisioned program and project on site to the Municipality of Kfardebian, the municipality administration has shown positive response to the proposal and cooperation. I was referred by the municipality to Mr. Walid Beaino, an active member of the Tourism & Information Committee, to whom I presented the thesis progress, the program and the design vision on the Jisr El-Hajar site.

Mr. Walid Beaino informed me that the Tourism and Information Committee had interest in intervening on this particular site with an appropriate program that creates activities for tourists, hikers, visitors to the area and the local community, with regard to the site>s natural context and its famous arch landmark. He showed great interest in the thesis, design vision on site, and adopting the project for future execution after the thesis, design vision and program get proposed to the Municipality of Kfardebian and the Ministry of Tourism.

Mr. Beaino has promised full commitment to the envisioned project and program on the site, and I have agreed upon developing the thesis, at first, as a proposal, then we would meet regularly during the process of designing the final project to achieve a fully fledged project on the Jisr El-Hagar Site in accordance to the building and zoning codes of Faqra.

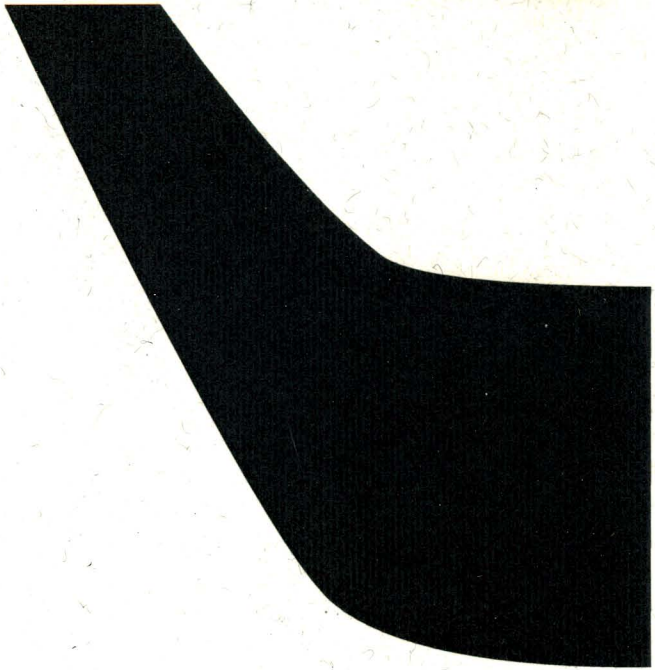
Faqra Club **&** Mzaar **2000**

The two establishments: Faqra Club and the Mzaar 2000 are not involved in terms of decision making within this particular zone in Faqra,

but are important role players in Faqra, as they constitute two major catalysts that create activity in the area, and hence play a significant role in attracting human flow into the area, and creating employment to the local population of Kfardebian. The main road leading to the two complexes passes by the Natural Stone Arch site (Jisr El-Hajar). Hence, a program on the site could be part of a road journey that goes through the program on site, and then moves to the program facilities offered by the Faqra Club and the Mzaar 2000, creating a whole programmatic scenario for the area.

The local community

The local community may be concerned about the area enhancement aspect the project is anticipated to create in Kfardebian, in addition to the job opportunities the program on site could open up for the locals.



Bibliography

1. Holl, Steven. Parallax. First Edition. New York: Princeton Architectural Press, 2000.

2. Kahn, Louis. Light is the Theme: Louis I. Kahn and the Kimbell Art Museum. First Edition. Texas: Kimbell Art Foundation, 1975.

3. Lobell, John. Between Silence and Light: Spirit in the Architecture of Louis I. Khan. First Edition. Boston: Shambhala, 1985.

4. Holl, Steven. Steven Holl . First Edition. Bordeaux: Arc en reve centre d'architecture, 1993.

5. Richardson, Phyllis. New Sacred Architecture. First Edition. London: Laurence King Publishing, 2004.

6. Futagawa, Yukio. Light and Space: Modern Architecture . First Edition. Tokyo: ADA Edita, 1994.

7. Frampton, Kenneth. Tadao Ando. First Edition. Tokyo: ADA Edita, 1987.

8. Schittich, Christian. In Detail: Building Skins. First Edition. Berlin: Birkhauser, 2007.

9. Keuning, David. Skins For Buildings: The Architect's Materials Sample Book . First Edition. BIS, 2004.

10 . Kubler, George. The Art and Architecture of Ancient America. Second Edition. England. Penguin Books. 1962.

11. "Architecture." 15.10.2008 <http://www.dhyanalinga.org/architecture.htm>.

12. Rotondi, Michael. James Turrell: The Other Horizon. First Edition. Ostfildern: Hatje Cantz,

13. " Eduardo Chillida´s Tindaya Mountain, Monumental Project." 08. 11. 2008 <http://www.arup.com/spain/project.cfm?pageid=3945>.

14. C hristo, "Wrapped Trees." 08. 11. 2008 <http://www.christojeanneclaude.net/wt.shtml>.

15. "A nalemma." 15.01.2009 <http://www.analemma.com/>.

16. "Stone Henge." 20.01.2009 <http://www.stonehenge.co.uk/>.

17. Beaino, Walid. Member of the Tourism and Information Committee. Municipality of Kfardebian. Lebanon.