PALIMPSEST
AND THE ARCHITECTURE OF TIME
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Time, Khronos, Kairos, Technics, Palimpsest

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ABSTRACT

The Palimpsest of time is ever changing. Mankind has tried to understand and utilize time through many lenses. Through the concepts of Khronographics, Kairographics and the Technics, architecture can be used as a means of expressing and revealing time.
To my family, without you none of this is possible.
To my committee, I am forever indebted to you for your wisdom and inspiration.
To my friends, thank you for everything.
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Key Concepts
**Khronos + Kairos**

*time as constant vs time as moments*

Khronos- The greek god and personification of time. Portrayed as having wings on the back signifying his movement as time. He is portrayed as an old man “father time” and is generally holding an hourglass representing times inevitable end. Khronos is the representation of time as chronological and linear. Khronos can be viewed as time in which we all live, and regardless of what is happening Khronos is always moving forward. The future is always looked upon with either hope or anxiety as no one knows if it will come.

Kairos- The greek god and personification of time as opportunity. Portrayed as having wings on the back and feet as a testament of his speed. He is shown with a lock of hair flowing on one side of his head and bald on the other. This represents how easy he is to catch as he approaches yet when he passes there is nothing to grab hold of, opportunity has passed. He holds a scale weighing both good and bad luck. Kairos, unlike Khronos, is not always flowing; Kairos is the here and now, the present. Kairos represents moments of significance; they are qualitative and extraordinary.

In the context of the thesis the concepts will be used to describe time as two very different yet apparent concepts. Khronos on one hand will be evident through various means of chronological time, as well as through the aging process in which the building exists.Kairos on the other hand becomes more of an ethereal concept, it can be evident through different systems that are influenced by Khronos through cyclical events, the sun, rain, wind, and other elements. Kairological time is measured as moments.

"*Use time, or time will use you.*"

*old proverb*
Khronos
and the built environment

All materials exist within khronos and are therefore aged through weather, nature, and human use. While buildings in the modern age aim at perfection and agelessness, the true beauty exists within the imperfect and aging these works experience. Mankind can find a connection within this aging process as it represents and substantiates the building as a testament of time and craft. Through the patina of wear from the weather. With the growth of nature and building’s ability to absorb the presence of human interaction, ones existential sense is heightened within the presence of that which supersedes the span of ones life.

“One can see how buildings constructed rapidly by indifferent men with indifferent plans, using remotely made and general parts are bound to create indifference at best. Thses buildings lack significance to anyone and are less real for it.”

-Michael Benedikt

*For an Architecture of Reality*
Kairos
and the urban context

Time can be charted through many apertures. Within the urban setting one can sense time through an acute understanding of one’s surroundings. Kairos exists all around a person within this setting. Kairos is constantly changing based on khronos, events such as the morning, lunch, and evening rush of people and cars. Kairos can be measured as something as simple as the changing leaves of the trees outside. Cyclical events such as the seasons, or even the sun’s position in the sky are all indicators of Kairos.

“We have a mental need to experience the reality that we are rooted in the continuity of time.”

-Juhani Pallasmaa

The Eyes of the Skin: Architecture and the Senses
Materials as Time Keepers

Materials have the ability to show through their aging process a depth and character that only is brought out through time. Natural materials degrade and must be maintained, without this craft the material will continue to age and show its true characteristics. Materials have the possibility of becoming anthropomorphic, or giving consciousness to inanimate objects, through their various uses, and characteristics materials can give a presence of warmth, light, coolness, scale, etc.. Materials have purity of substance and are appreciated for their romantic connotation as an object that is affected by time. Materials while going through this aging process can join the urban built environment with the natural. The surface of a building is ever changing, the patina and growth of new skin allow one to recognise the necessity to revere or change the surface.

“Aging adds enhancement and the idea that various markings and layers of surface reward and allow one to recollect earlier stages in history of a building and the human life associated with it.”

-David Letherbarrow

On Weathering: the Life of Buildings in Time
The importance of the craftsman in the modern world is far less significant than ever before. In the modern era of speed and high demand an interest in high quality time-consuming endeavors has been lost. As a result mass production strips the importance of craft from products and relegates the well crafted to only objects for the wealthy. Craftsmen have existed to create based on a moral imperative to benefit their communities, as well as the competitive drive to create and seek reward. The clockmaker who lives within khronos is constantly working within kairos, to create objects that display khronos.

In the context of the thesis craft represents the aspects of time in which the end user of this project will find themselves. Whether through the construction of time pieces, or via the maintenance performed on the building this sense of craft as time will be expressed.

“The craftsman represents the desire to do something well, concrete, for its own sake. What keeps them going is the belief in their work and involvement with materials.”

-Richard Sennett

*The Craftsman*
Technics
Time as measured through technological advancements

The Technics is a concept derived by Mr. Lewis Mumford. The development of technology is divided into three overlapping phases: eotechnic, paleotechnic and neotechnic.

Eotechnic- The eotechnic phase of civilization represents a civilization in tune with the world in which one lives. The use of natural materials easily manipulated by man as well as simple machines. This techinc represents time as a slow and based on the elements.

Paleotechnic- The paleotechnic phase of civilization sees the advent of the industrialized city. With the introduction of mechanical instruments and the regulation of a work day no longer based on how much light the sun produces, the hours of work become longer and mass production of materials and products arrives. Time is starting to become faster, and demand forces supply to quicken.

Neotechnic- The neotechnic phase sees the transmission of data and speeds unperceived to the eye. The neotechnic phase is about lighter, faster, taller, and sees no end as this phase represents civilization no longer necessarily relying on the restrictions of nature or reality.

"The clock has been the foremost machine in modern technics; and at each period it has remained in the lead: it marks a perfection toward which other machines aspire."

- Lewis Mumford
Technics and Civilization
Palimpsest

Palimpsest comes from the Greek word palimpsestus meaning scraped again. Palimpsest within art is used in reference to writing materials such as parchment or stone, which have had text and imagery removed and then had their surface reused. Palimpsest can be used to also refer to something having many layers that have revealed themselves through their juxtaposition.

In the context of the thesis, the concept of palimpsest represents time as layers of existing and new aspects of the built environment, and how through their juxtaposition a sense of the various times can be expressed.

"The only reason for time is so everything doesn’t happen at once."

-Albert Einstein

PALIMPSEST

THE LAYERS OF TIME THAT HAVE BUILT UP AS WELL AS ERODED TO FORM WHAT EXISTS AT THE PRESENT

- KHRONOS
  THE CONSTANT FORWARD MOTION OF TIME
  - THE DISPLAY OF TIME THROUGH CHRONOLOGICAL MEANS
  - THE DEGRADATION OF MATERIAL THROUGH TIME

- KAIROS
  MOMENTS OF TIME
  - THE DISPLAY OF TIME THROUGH CYCLES OR SPECIFIC EVENTS
  - THE MOMENT OF CHANGE WITHIN TIME

- TECHNICS
  - EOTECHNIC
  - PALEOTECHNIC
  - NEOTECHNIC
The Clocktower

Although generally perceived as purely aesthetic creation now the clock tower use to serve a very important function within the towns and communities they were created. In our modern era time can be found on nearly all electronic objects that we carry on our person. But when time was not a regulated element of society the clock tower, or bell tower would chime to inform the townspeople of the conclusion of their day or to report to the town square or the approaching mass. When time became more standardized and mechanized the clock tower became a symbol, indicating the work day. And this along with mechanization allowed for the industrial revolution as time and mass production became more important. Today clock towers seem to be purely aesthetic but if a tower could reintroduce means of displaying time and its effects perhaps a new appreciation can be garnered.

"The clock is not merely a means of keeping track of the hours, but of synchronizing the actions of men."

-Lewis Mumford

Technics and Civilization
Monuments to Time
precedents of Khronos and Kairos

Mankind through its lust for knowledge and understanding has created places that define time as both Khronos and Kairos. These monuments to time stood as testaments to the significance of man’s necessity to measure moments within one’s existence.

- Stonehenge an ancient burial ground marked by huge stones in a circular pattern in the English countryside. The megalithic structure features a system of marking the rising sun in during the winter solstice.

- St. Marks Clock tower a renaissance building located within Piazza san Marco in Venice the clock-tower was built not only to symbolize and express the current time but also features a system for displaying the astrological cycle, the phases of the moon, and the twenty four hour clock cycle.

- Jantar Mantar is a collection of architectural astronomical instruments, built in Jaipur. The observatory consists of fourteen major geometric devices for measuring time, predicting eclipses, tracking stars and holds significant importance as as ancient Indian astronomers used the facility for religious purposes.

“Measuring time means imposing a certain order based on selected temporal references and maintaining it.”

-Jaqueline de Bourgoing
The Calendar: History, Lore, and Legend
Technics diagram in relation to the types of chronological time display systems.
A MEANS OF SECURING A LIVING

THE CREATION OF THE MACHINE

THE ASCENSION TO DREAMS

Technics diagram displaying relations to the metaphorical attributes of the shop, atelier, and home.
Technics diagram showing the stages of growth as building systems evolved.
Technics diagram showing the implementation of hierarchy for the clock tower and its program.
-HANDICRAFT
-NATURAL MATERIALS EASILY MANIPULATED BY MAN
-WOOD, STONE, BRICK, ANIMAL SKINS
-MAN IS HARMONIOUS WITH NATURE
-VERY HEAVY, SLOW CONSTRUCTION

-MASS PRODUCTION
-NATURAL MATERIALS FORGED INTO NEWER MATERIALS
-IRON, STEEL, CONCRETE
-MAN DOMINATES NATURE THROUGH TECHNOLOGY
-HEAVY, FASTER CONSTRUCTION

-AUTONOMY
-MATERIALS CREATED BY MAN
-GLASS, POLYMERS, FIBERS, ALLOYS, INFORMATION
-MAN TRIES TO PROTECT NATURE
-LIGHTWEIGHT, RAPID CONSTRUCTION

Technics diagram showing the connection between time, craft and construction.
Techincs diagram showing that through the reclimation of technic types a new typology manifests.
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Site
When the time came to choose a site that would help display and interact with the concepts of the thesis the choice was simple. Old Town Alexandria is a unique place unto itself, it possesses a clear indication of its heritage but also embraces modern society as well. The King Street axis was particularly interesting as it provides a clear delineation of the technics as building systems evolved as the city grew. Alexandria was one of the original ports within the colony of Virginia and was founded in the early 1700s. The historic center that is old town, has a high concentration of boutiques, fine restaurants, antique shops and theatres. It is a major draw as a tourist destination and place of night life. This suits into the concentration of time as an aspect of determining site. These activities and businesses all rely and use time as an aspect of their existence whether it be the antiquities, or the hand crafted or even the night life time is heavily displayed in this city.
The site is located at the corner of King Street and Commerce Street. Currently the site is occupied by a rather mundane rug store that dominates the surface area. The site offers unmeasurable opportunity in adding a place of gathering, a mid-point in the King Street corridor, and a new attraction to heighten the interest in Old Town Alexandria.
Within the context of the site are a large number of old growth trees as well as plants. Not only is there a metaphysical connection between the age of a tree and man but there is also a display of Kairos through the seasons and the changing of the trees that help man understand subconsciously that time is displayed. The age of the tree through Khronos also leaves an impression on man that previous entities have existed before himself.
One of the most interesting parts of the site is the diagonal road, commerce street. At one point this road ran diagonally through old town as a means of connecting the city with the western trade routes. Today the road has no real purpose and has become a weak link within the city grid. This diagram expresses that the other axes are more substantial and thicker routes with pedestrian and vehicular traffic, while commerce hinders this system.
In order to create a stronger grid and also open the site up for further development, commerce will become a cul-de-sac and serve as more of a parking area for the residents around the site, while leaving a presence as part of the palimpsest of the site. This elimination of the road will help strengthen the other axes found in the city grid.
Old town is known for its boutiques, artisans, and antique shops. In the context of the thesis it was important to find a place that would have a large presence of crafts people whose work specifically deals with time. Placing an object that would have a civic presence, as well as a presence that adds to the nature of fine crafts people. The buildings in gray represent the locations of artisans, antique dealers, boutiques as well as fine restaurants.
When Alexandria was founded, the system of city planning was an evolution of the Roman grid, which has been used throughout the world as a means of organizing cities. A unique aspect to the city grid of Alexandria is the six-degree rotation clockwise from the cardinal directions. Along with the near perfect organization of north to south, this allows for the use of the sun as a means of clearly indicating time within the site. This alignment also allows for the harnessing of many natural elements, from harnessing solar energy to capturing the wind in a means of not only showing time as Kairos but also using the orientation as a means of creating a more sustainable building.
This diagram represents the sun path over the course of a year in regards to the site. As a means of projecting both Khronos and Kairos the sun may be one of the most important elements in determining the site for the project. With a near perfect Northern orientation the sun will play a major role in the display of Khronos and Kairos within the site, as well as the placement of elements to harness the sun.
One of the most significant aspects of the site has to be the major axis that runs directly to the north. King Street within the context of Old Town Alexandria is the major artery that connects the river with the Masonic Temple located to the west. The site’s central location within this context allows for the inclusion of a new civic piece to mediate the connection of the waterfront and the masonic temple.
Old Town Alexandria was founded on the shore of the Potomac River, as the city grew a progression into the West and North were made. One of the most interesting aspects of Old Town is this clear delineation of the technics as the city expanded to the north and west.
The corner of King and Commerce is significant in the near central location in the King street corridor. The corner site has a large presence on King Street and will serve as an ideal location for a new civic piece of architecture.
Pump at the corner of King and Commerce, ca 1900.

The pump was a solid piece of timber about nine feet long and one foot in diameter with an estimated weight of 400 pounds.
The Clepsydra

A Greek word, that literally mean water thief, a clepsydra is a clock powered by the forces of water. One of the earliest ways of telling time was through the use of large pots that would leak water into another in a means of showing through a measured volume of water the time passing. As the mechanization of the world was coming so did the mechanization of clepsydras. Using a system of gears and plungers the clepsydra would display time through a mechanized system. Even in our neotechnic society such clepsydras still exist and are used to operate digital time devices.

A New Attraction

Within the context of the city the clepsydra will become a means of showing the importance of craft and the nature of quality within the city of Alexandria. The clepsydra will bridge the Potomac waterfront with the Masonic Temple. Like the Old Town waterfront and the Masonic Temple the new clepsydra will draw tourists and people interested in the unique and quality made. The clepsydra will also serve as one of the attractions of Old Town and help revitalize the in-between space of the waterfront and Masonic Temple.
The site of the Clepsydra much like Old Town, has evolved throughout the city’s history, an aspect of time, The Palimpsest allows for the showing of time through the layers that have existed before. Using this concept the reflecting pool in which the Clepsydra will sit will show through its various elevation changes the previous layers that have existed on the site. As the Clepsydra runs the water level will fluctuate and recede showing these various layers.
The transformation of the tower as the thesis began to develop and ultimately led to the finished product.
1. EOTECHNIC
WOODEN STRUCTURE ERECTED ON STONE BASE.

2. PALEOTECHNIC
STEEL STRUCTURE ON CONCRETE BASE.

3. NEOTECHNIC
GLASS AND STEEL STRUCTURE ON CONCRETE FOOTINGS
Trajan’s Column, is a column located in Rome which depicts, through its upward spiraling reliefs the victories of the Romans in the Dacian wars.

The Tower of Babel was a tower in Babylon, through its spiraling growth symbolically reached for the heavens in man’s quest for the dominance of earth and the heavens.

Similar to the precedents, the Clepsydra tower, through its various technics towers strives to show that through each of these technics mankind strives to reach for the heavens and signify its dominance over the earth.
Eiffel's Tower Assemblage

Eiffel’s paleotechinc tower represents the period of gaining speed, the use of the iron and bolt construction rising to the heavens in such speed unimaginable at the time. It is a testament to its time and now an icon of the city it resides in.

The following page traces the steps in the erection of the Clepsydra tower. The process of assemblage begins with the arduous task of erecting the reclaimed timber beams and slowly staking them to the achieved height. The height is based on the surrounding context of the eotechinc homes and offices. The paleotechinc becomes faster in assemblage as it is uniform and bolted. The tower now becomes similar in height to other paleotechinc buildings in the vicinity. The final leg of the tower is the fastest to assemble the lightweight steel and glass manufactured to the exacting detail come together and aim for the heavens.
Process of Assemblage

Eotechnic

Paleotechnic

Neotechnic
Time Keeping Devices - North Facade

Digital facade, a neotechnic facade that can display digital information as well as harness the sun via solar cells.

Mechanical clock a paleotechnic instrument used to tell time in an analog manner.

Water chamber used to capture water from the reflecting pond. This builds up over the course of an hour indicating the passage of minutes. After an hour the water is released to power the water wheel of the clepsydra.

Reflecting pond that over the course of an hour through its loss of water reveals the layers of the previous structures beneath.
The wooden louvres are made from the primitive eotechnic wood, yet they serve a more high tech purpose. angled to alleviate the harsh sun in the summer yet allow sun to penetrate in the winter. The louvres also serve as time keepers as they will like the most of the building succumb to the aging process, allowing Khronos and Kairos to be displayed.

The bell tower another of the eotechnic time keeping devices, the wooden structure along with the copper bell will display both Khronos and Kairos through their aging process. The tower also chimes every hour through the interaction with the gear driven clepsydra.

Sundial the most eminent of eotechnic time keepers faces the south. The veins of the dial are made of copper to allow Khronos and Kairos to take their effect.
THE WEDGE SHAPE OF THE SKYLIGHT NOT ONLY LETS IN LIGHT AND ALLOWS THE OWNER TO GAZE OUT AT THE INFINITE SPACE, IT ALSO SERVES AS GNOMON OF THE SITE'S SUNDIAL.

THE GLASS FEATURES A MIXTURE OF BOTH L.E.D AND FRIT TECHNOLOGY USED TO HARVEST SOLAR POWER AS ANOTHER MEANS OF POWERING THE CLEPSYDRA AND THE BUILDING.

THE ELEVATOR, WHICH IS DRIVEN THROUGH THE GEARS OF THE CLEPSYDRA IS ONLY AVAILABLE AT THE TURN OF THE HOUR.
The satellite dishes are used to broadcast the atomic clock signal.

Copper sun shades on the west facade are used to convey time via their movement and aging. They also serve the purpose of regulating the harsh western sun light.

The wind generator is used to gather energy via the western wind that blows through the area, also displaying Kairos via its movement.

The cutout in the concrete facade gives visible access to the water chamber and its time marking system.
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The Building
The site plan for the proposed Clepsydra tower. The drawing uses the concept of the palimpsest to show through various layers within the drawing the plans of the city in 1885, as well as today, and with the proposed plan for the tower.
A. Summer Solstice  B. Winter Solstice  C. Summer Equinox  D. Winter Equinox
Level one -- Street Level

1. View of Three technic stair system as exiting the building.

2. View of the clepsydra’s water wheel and eotechnic and paleotechnic systems.

3. View of the primary power generating wind mill, along with the neotechnic steel framing system.

4. View from the South of the tower and its various technics.
Level two - The Gallery

1. View of the neotechnic glass platform viewing one of the primary drive gears for the clepsydra.

2. View from inside the show room of the gallery with a look to the north.

3. View of the eotechnic bell tower converging with the paleotechnic steel tower.

4. View of the concrete and steel construction of the paleotechnic tower, with a glimpse of the main water storage tank for the clepsydra.
Level Three - The Atelier

1. View of the clock-maker’s table looking to the east. the table is assembled using the three technics.

2. View of the workroom of the atelier looking north with a glimpse of the clock face.

3. View of the copper sun screen system. Each panel is hinged and also tells time via Kairos as the wind shifts the panels as it blows.

4. View of the clock face and the paleotechnic steel.
Level Four - The Living Area

1. View of the living area looking towards the north.

2. View of the living area looking towards the east.

3. View of the dining area looking west at the copper screening system.

4. View of the kitchen area looking south at the sun shading louvres.
Level Five - The Bedroom

1. View of the bedroom looking to the north.

2. View of the bedroom looking to the east.

3. View of the bedroom looking down to the living area and to the west.

4. View of the bedroom looking south towards the bathroom.

Scale: 1”=8’
Level Six - The rooftop

1. View of the dish array used to broadcast the atomic time.

2. View of the mechanical systems looking south. The solar cells located within the glass send energy to these units where it is utilized throughout the building.

3. View of the converging paleotechnic and neotechnic towers.

4. View of the copper and wood sun shading devices.
The Section drawings show the transition of light as the seasons change as well as how the day and night affect the building’s condition.

The section on the previous page shows how the passive systems are used to control the lighting levels in the summer and winter. Through these louvered systems the building can take advantage of the neutral northern and eastern light yet, block the overabundant southern and western light in the summer years. On the other hand during the winter months the louver will let in a plentiful amount of southern and western light as the sun’s position is lower in the sky. This system not only passively will heat and cool the building but will also provide ample lighting conditions to help alleviate the amount of energy used on lighting.

The section on this page shows the north facade cut looking south. To the right or western side of the building the wind generator can be seen, this system along with many of the other passive systems makes this tower an organism of time living off the elements and not relying on the city’s power supply. To the left are the pulley systems used to operate the hourly elevator as well as the hourly bell from the carillon.
North and South elevations
East Elevation
Time Lapsed Renderings
The Sun and Moon indicate when to work, play, and sleep.
Seasons tell us when to get up, get out, or stay in and hibernate.
The tower after construction has finished.
The tower after many years of aging.
Objet D’Art
Palimpsest and found objects

This original piece of art is used to express the fleeting nature of time. Through its construction of found objects it shows that even the most mundane of things can become an intricate part of a whole to inspire and excite.

The large model on the previous page is constructed using a similar technique, taking scrap models from fellow students and granting a new life. The model is created out of four other models and is a testament to the layering of time that exists within the thesis.
“The earliest of achievements in precision mechanics, and the essential steps in its progress up to the present day, must be credited to horology.... At a very early date clock makers devised tools with which the most delicate operations of their trade could be accurately performed... they were led to investigate the properties of the types of copper and steel used in their work, to study the thermal expansion of metals the elasticity and resilience of springs. They invented and perfected machines for the manufacture of some of their simpler tools. Thus, apart from strictly horological inventions thanks to which the precision of timepieces was continually improved, the clock makers placed at the service of the science of mechanics an array of equipment which was constantly being perfected and had only to be taken over, directly or indirectly, by the constructors of instruments.”

- Maurice Daumas

*Instruments Scientifiques*
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Image Resources

All images within this work have been produced by the author, with the following exceptions:

Page 18
Figure 1, Vincent, Frederic. “Stonehenge” 7 April 2008
<http://upload.wikimedia.org/wikipedia/commons/d/da/Stonehenge_back-wide.jpg>

Figure 2, Green, Peter. “Clock tower of San Marco” 5 June 2006
<http://upload.wikimedia.org/wikipedia/commons/2/2a/Clock_tower_Piazza_San_Marco-%28Torre_dell'Orologio%29_Venice.jpg>

Figure 3, “Jaipur Observatory” 30 March 2005
<http://upload.wikimedia.org/wikipedia/commons/3/3f/Jantar_Mantar_at_Jaipur.jpg>

Page 41
Figure 4, Shephard, Steven. ”Alexandria Archaeology Museum - Fire Well and Cistern”. 22 Nov. 2009.
<http://oha.alexandriava.gov/archaeology/ar-firewell-cistern.html>

Page 49
Figure 5, “Trajan's Column” 12 April 2008.
<http://moblog.net/view/321524/trajans-column>

Figure 6, “Tower of Babel” Peter Bruegel the Elder Complete Works Online. 20 March 2010.

Page 50
Figure 7, Eiffel, Gustave. “Construction of the Eiffel Tower”, La Tour De Trois Cents Metres, 1900.