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NATURAL PHENOMENA AND THE SENSES: Linking Memory and Corporeal Experience

by
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Bachelor of Arts, Dartmouth College, 1998

Submitted to the Department of Architecture in Partial Fulfillment of the Requirements for the Degree of Master of Architecture at the Massachusetts Institute of Technology. February, 2002.

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Abstract

How could the experience of our rituals be made more meaningful? Our experience of ritual exists as an exchange between our memory and natural phenomena in a place over time. These place specific phenomena are filtered by our senses of touch, taste, smell, hearing, sight and balance before becoming part of our memory. It is the task of the architect to create place that heightens certain qualities of local phenomena in order to make more specific and meaningful our rituals.

Too often, today we are trapped in homogenized landscapes of ideas and visual images that overshadow our remaining senses. To allow for more meaningful and personal memory, we must look to total corporeal experience of phenomena in specific places. Slowing our physical actions, we allow all of our senses to engage the world around, and only then do we become more aware of our body and experience in that world. Ultimately, in better understanding our human corporeal and experiential roots we may feel both secure and inspired being part of a system that is far more pervasive and permanent than we are.

The project that follows, the renovation of a house in South-Western France, is a physical exploration of the question and notions posed above. Phenomena of light, sound and material are explored through the architectural making of place as it relates to the rituals of those inhabiting the house.

Thesis Advisor: Fernando Domeyko
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ACKNOWLEDGEMENTS

In thinking about those people who have made a difference in my architectural life, I realize that their contributions reach far deeper than the product of this thesis.

To Chris Dewart and Andrew Scott. Thank you for your support and encouragement. I appreciate the time you spent advising me.

To my advisor and mentor Fernando Domeyko, with whom I share so many philosophical interests. You made architecture poetic for me, and taught me never to stop asking questions about the world around me. I have embarked on a wonderful and exciting journey exploring the physical reality that makes our lives meaningful. To you I am most grateful.

To my parents. Mom and Dad Boynton, thank you for your ideas and sharing a summer full of wonderful memories. Mom and Dad Pitts, for your multilateral support and love, I thank you. This thesis would not have gotten off the ground without you. What a romantic little place you found.

And most importantly, to my soul-mate, Sarah. What an adventure! I would not have made it this far had you not been here. Your intensity and devotion never cease to inspire me. It's my turn now...

THESIS OVERVIEW

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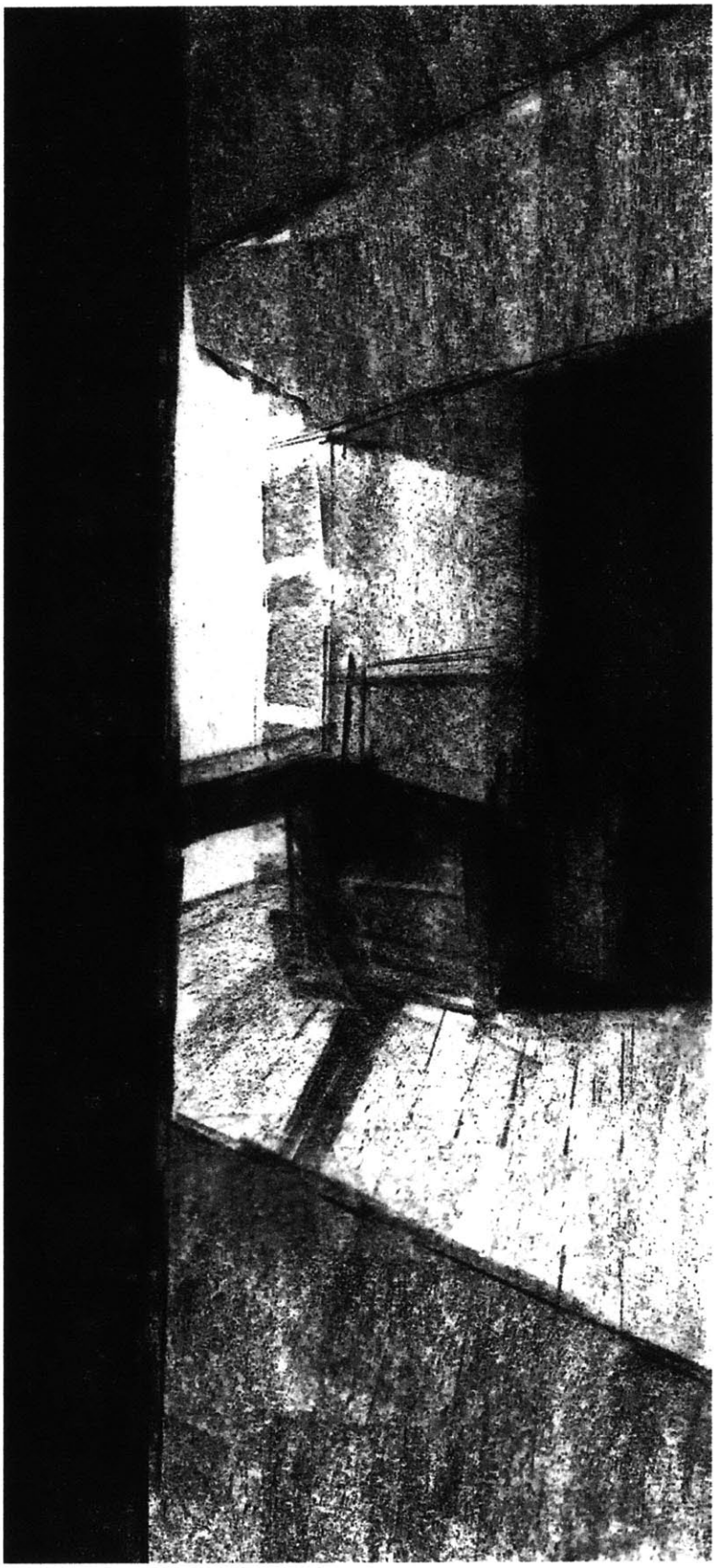
SOME THOUGHTS

"The rhythm of the sun establishes the daily cycle as the structure that most immediately orders human existence. But this daily structure is analogous to the seasonal cycle of birth, growth, death, and rebirth, so that the sun also becomes a daily reminder to the human being of the processes fundamental to nature."

R. D. Dripps

The First House. Myth, Paradigm, and the Task of Architecture



The time spent on this thesis and over the past three and a half years has allowed me to explore certain strong notions I hold about the design of architecture. Of primary importance to architecture is the making of ritual specific place. As humans we experience rituals that guide and give our lives a sense of purpose and direction. Rituals: personal, culture or religious, are those repeated activities that hold significance for the person or group engaged in them.

Whether participating in a dance festival or sitting back talking to old friends, rituals require places in which to be acted out. The more specific and personally meaningful we make a place the more powerful a specific ritual becomes. For example, I enjoy reading and day-dreaming in a soft armchair, next to the warmth and reflected light of a fire, in a quiet place just big enough for a couple of good friends to sit around me. These are very specific conditions all of which together allow me to best read and day-dream. It is important to think of these conditions as a whole and not the sum of many qualities, when creating place. This is not to say that this place is so fixed in its qualities that it cannot be used at different times, and under different conditions. The place that would best accommodate my reading and day-dreaming, although best suited to this ritual, could also be used as a place to converse. It is, however, the architect's task not to homogenize place, making it mere form and space suitable to all purposes, but to give it very specific qualities and characteristics.

The question then becomes, how do we create these specific qualities and characteristics that constitute a meaningful place? Specific qualities are arrived at by controlling phenomena in time. Phenomena include natural forces such as light, sound, smell, material, gravity, wind and rain and human made or altered things. In other words, phenomena are tangible things changing at different rates through time, and not ideas, symbols or representations. Built architecture, in and of itself, is a phenomena, controlling and filtering other phenomena which are both in turn processed, over time, by the senses and not abstractions that exist only in the mind.

As humans who experience time it is critical to design for place in time. We must keep in mind that phenomena are not static, they change over time. Therefore, in controlling phenomena we must control them as they change over time. For example, the lunar path above us, not only changes over the course of a night but over the course a year. The flow of people through space waxes and wanes depending on the ritual being engaged in. It is the architecture's task to create architecture

that will filter and direct these phenomena making specific our experience of ritual in a place. Without this careful control of place and time, space remains generic, made for the moment, and no meaningful ritual can occur.

In controlling phenomena in time we are revealing their specific qualities to our senses. It is critical, especially in today's fast pace societies where visual and mental cues predominate, that we engage all the senses. Once the phenomena, in conjunction with meaningful ritual, have been engaged in by our senses, they are then processed by the mind and become part of our personal and or collective memory. But this is not a unidirectional, linear process. Each place we visit and ritual we engage in are experienced through a collection of memories which leads to the making of new memories which, in turn, will later affect our experience of other places and rituals.

Experienced ritual in place over time -leads to change in - Memory - leads to change in - Next ritual in place over time...etc

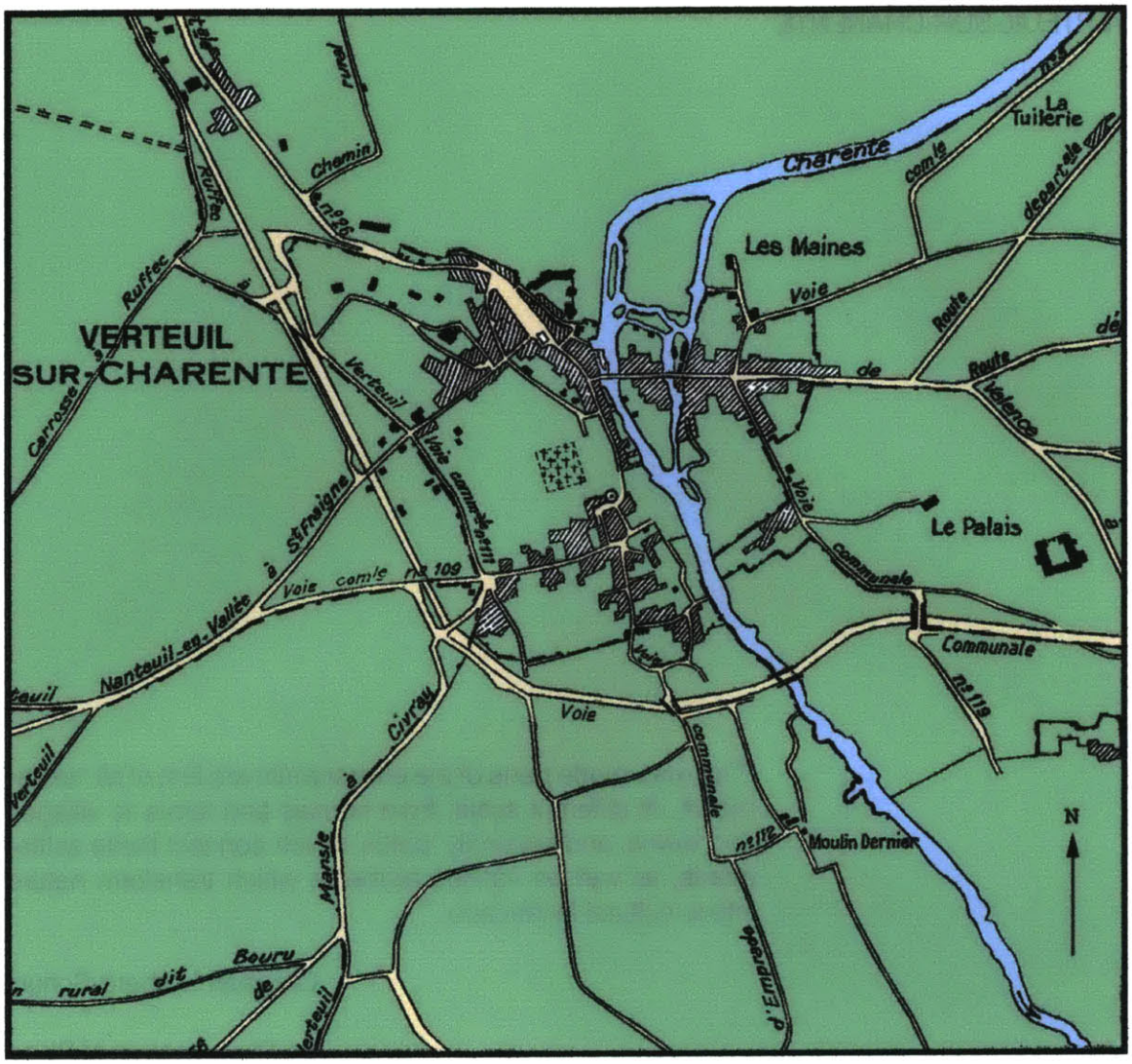
Although, our tolerances and processing of rituals may be slightly different, we, as humans, all share our ability to engage the environment with our senses. It is probably true that what I experience is specific only to me and not anyone else. However, on a fundamental level, because I am equipped with the same senses almost everyone else possesses, I am able to begin designing with our common experience of phenomena in mind.

VERTEUIL-SUR-CHARENTE

"The man-made parts of the environment are first of all 'settlements' of different scale, from houses and farms to villages and towns, and secondly 'paths' which connect these settlements, as well as various elements which transform nature into a 'cultural landscape'."

Christian Norberg-Schulz

The Phenomenon of Place


VERTEUIL
SUR-CHARENTE
Charente
La Tuilerie
Les Maines
Le Palais
Moulin Dernier
Voie
Communale
Route
Chemin
Ruffec
Carrosse
Nanteuil-en-Vallée
Mansle
Civray
Bouru
rural
dit
N

The town of Verteuil (literally meaning green water) is located on the Charente river in South Western France just South of the Vallée de la Loire. The town is nestled among rolling corn and sunflower fields and islands of dense forest and is built of rough cut stone buildings sheltered from rain and sun by terra cotta roofs. Most of the buildings in town sit alongside two primary perpendicular roads. These two roads, in turn, meander around two dominant topological features, the town hill and the Charente river. The first road hugs the base of the hill, traveling North/South, parallel to the Charente river, while the second road runs perpendicular to the river, joining the first just South of the town square. The house sits prominently on this second road, on the Charente river, just after the second of two bridges leading out of town. All directions from town soon lead to picturesque farm land.

Verteuil is quite sufficient as a town on its own and rarely would one have to venture to a larger town for everyday supplies. The town boasts among other stores: two backeries, serving delicious fresh bread every morning, a cute little restaurant with several live pigs penned up out front, a good barbershop and several bars. What more could one ask of a small French town?

There exist three dominant man-made landmarks in the town, all of which can be viewed from different positions in the redesigned house. The first land mark and symbol of the town of Verteuil is the castle. Sitting atop a rock bluff, the castle, currently inhabited by a Portuguese marquis, can be seen from several vantage points throughout the town and along the river. The castle, originally a fortress, was built in the 11th century and was subsequently added onto (e.g. the castle chapel built in the 12th century) and modified over the course of several hundred years. The first town buildings were constructed around the base of the castle for protection from invasion.

The second landmark is the Abbey which is located across the river from the house. Today the Abbey and adjoining houses which surround an open courtyard, are privately owned. The Abbey courtyard looks out onto the river and to the West façade of the house.

The third landmark, sitting atop a hill, is a Romanesque church and accompanying town graveyard. The church, built in the 12th century, was erected over the grounds of a more primitive 11th century church. From the church hill, the entire village and farmland beyond can be seen. From this vantage, the sunsets are particularly beautiful.

Map
The Town of Verteuil with the Charente river, roads and farm/natural landscape indicated.

Verteuil will never cease to capture my imagination with its wandering rows of buildings, sounds of running river water, and red sunsets reflected off low hanging clouds.

Top Map . pg 21
The castle, church and abbey are indicated with colored circles and the house plan is colored. The house sits on the South side of the second bridge as one heads East.

Bottom Map . pg 21
The house sits in a valley that the Charente river has carved out. From the church hill one can almost see the entire town. The caslte, from atop its bluff is visible from many locations throughout town.

LE BOURG
Charente
VERTEUIL-SUR-CHARENTE
(CHARENTE)
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LE BOURG
Charente
VERTEUIL-SUR-CHARENTE
(CHARENTE)
0 100 200 400 600

"Why do so very few modern buildings appeal to our feelings, when almost any anonymous house in an old town or the most unpretentious farm outbuilding gives us a sense of familiarity and pleasure?"

Juhani Pallasmaa

The Geometry of Feeling. A Look at the Phenomenology of Architecture

Strolling through town one gets the sense that it was built over a long period of time, by people very respectful of nature and its cycles. Roads, paths, and buildings run along the sides of and over the town hill and Charente river, and not through them. Almost all of the building walls are cut by hand and constructed from local lime stone, the floors are oak timber cut from local forests and the roofs are tile made of earth. Most houses have verdant gardens, onto which they look, where inhabitants eat and talk and where children play.

As soon as one leaves the small town, whether by road or by river, one immediately finds farm fields and forests. The fields, corn, sunflower and wheat among others, come in many sizes, smells and colors. The care put into tending these fields indicates that the farmers must be vigilant of the weather, the sun and the seasons. The forests and trees, providing shade to livestock, are sprinkled all about the open land and are home to a wide variety of wildlife. Because they rely so heavily on their natural surroundings to sustain themselves, it is no wonder the local people live in such symbiosis with nature.

This close and deeply respectful relationship to the natural environment has influenced the design of the house and its emphasis on materiality, orientation, transparency, spatial layout, bodily movement, and place making. The experience of living in the house is to be closely integrated with the natural local phenomena. The understanding, filtering and incorporation of three dominant phenomena in the region, light, sound and material, are of primary importance to the ritual of daily life in the house.

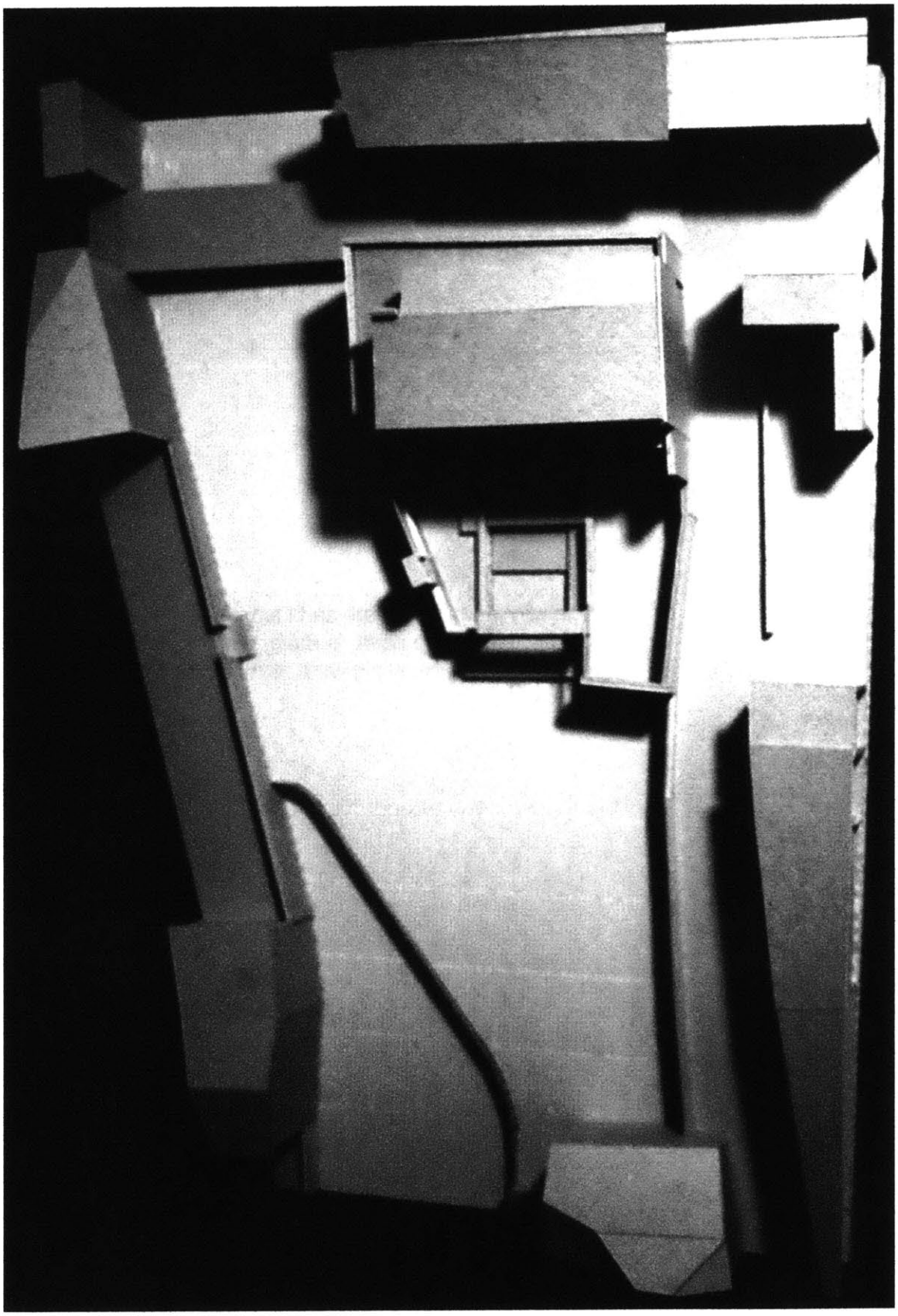
Top photograph
Picture taken looking towards one of several mills, down the Charente river. The West façade of the house is visible on the left.

SITUATING THE HOUSE

"The way in which you are and I am, the manner in which we humans *are* on the earth, is *Buan*, dwelling. To be a human being means to be on the earth as mortal. It means to dwell."

Martin Heidegger

Poetry, Language, Thought



The house was built in the early 19th century and has passed through several families before finding my own. One of the more prominent owners was the Docteur Deux Désprès, the town doctor and mayor. As such, the house still stands as a symbol of some importance to the townspeople (especially those old enough to remember more directly the mayor).

The house as it currently stands, is built around two dominant features: One of the main town roads, and the Charente river. A three-foot wide sidewalk separates the road and the North (front) of the house. This close proximity is one of the reasons there exists a problem in the house with the sound generated by passing cars and trucks. The river flows around the West and South (back) sides of the house as well as in a canal under the house. This subterranean canal relieves water pressure in times of flooding. The water, so integral to the character of the house, reflects light and sound, is an open space on which wind blows and is a potential source of nourishment (fish!).

Unlike many other town buildings, the house has no party walls, and as such, one can experience exterior site conditions from all four sides. As one of just a few houses directly across from a bridge, the house is quite visible to people passing through town. Because of this location, the house has two publicly viewed façades. One of these façades is on the main street while the other overlooks the river. These two public façades not only act as the house symbol, but, along with the house next door, they also act as part of a figurative gateway to the outer portion of town. The remaining, South and East façades face the garden/river and a side street respectively.

Site Model
The abbey and courtyard are to the left. The mill is at the bottom, and one of the main town roads runs in front of the house at the top. (North is up)

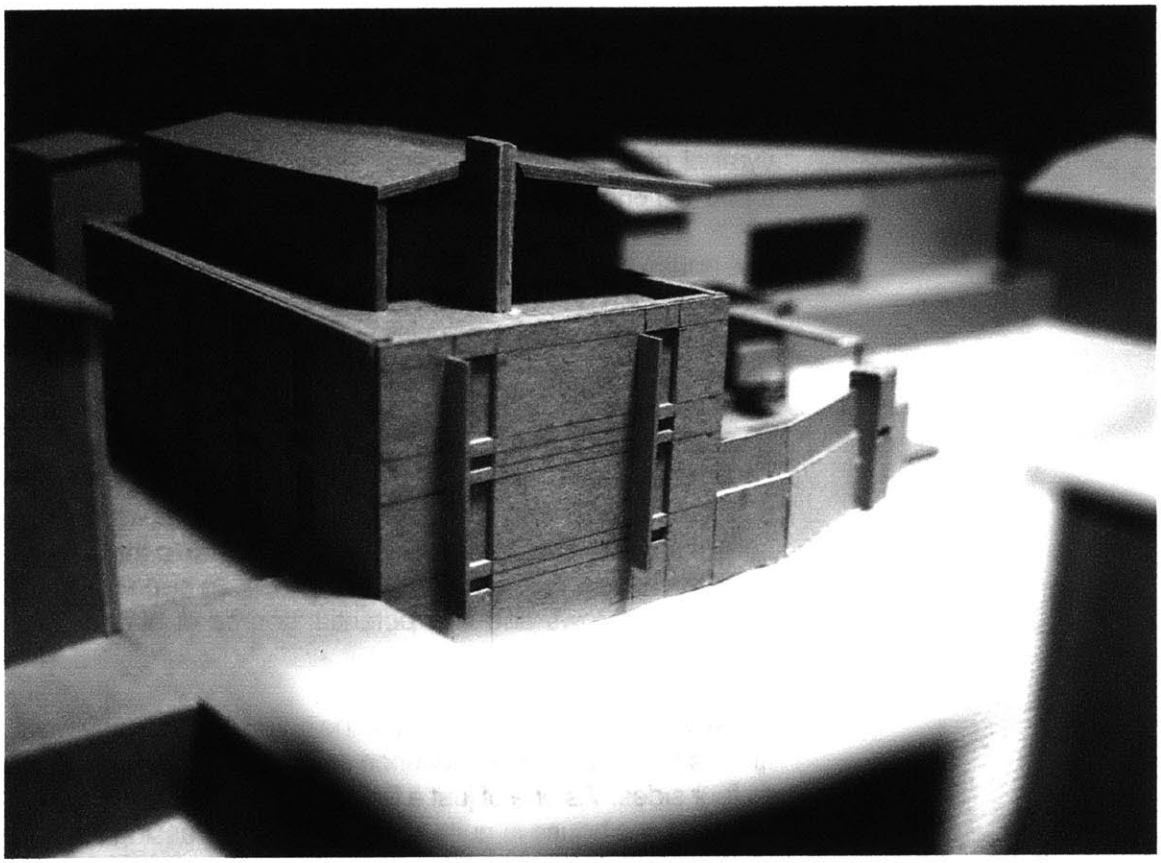
Top Site Model . pg 30
West façade view of the house with the river running in front. Main road running in front of the North façade.

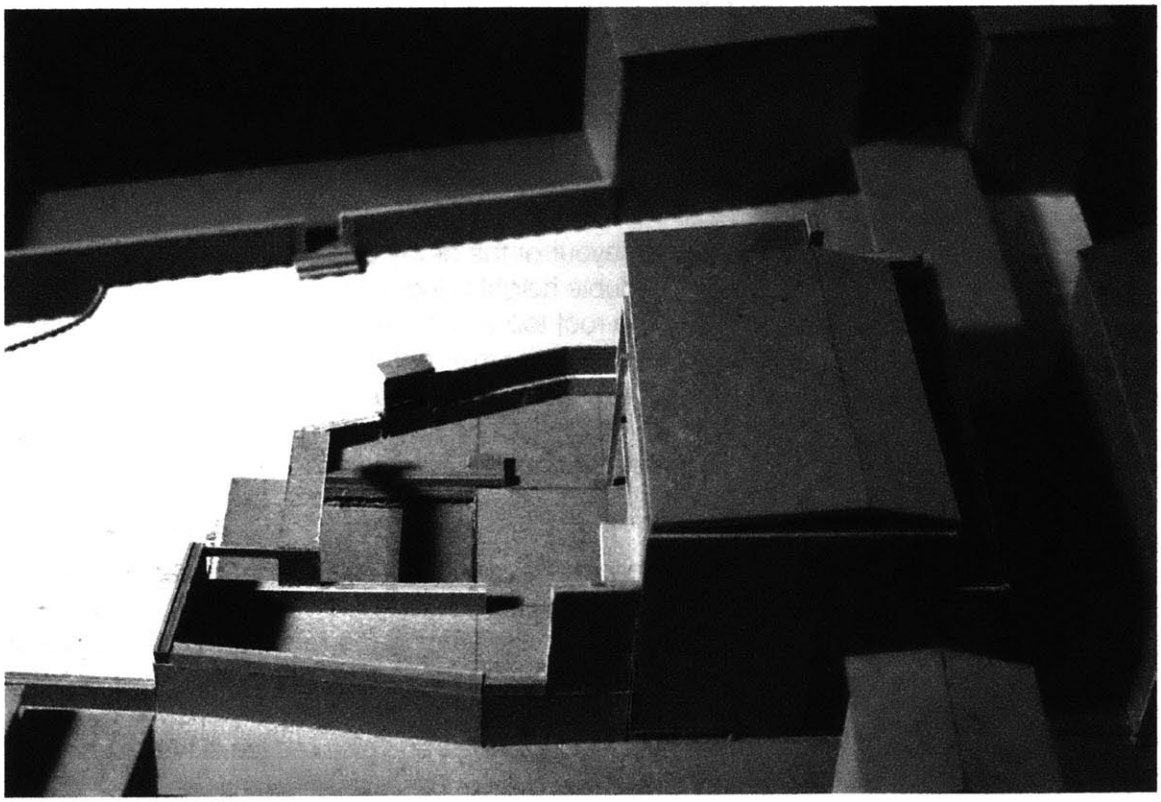
Bottom Site Model . pg 30
East façade and garden view of the house with the river running around the West façade and garden.

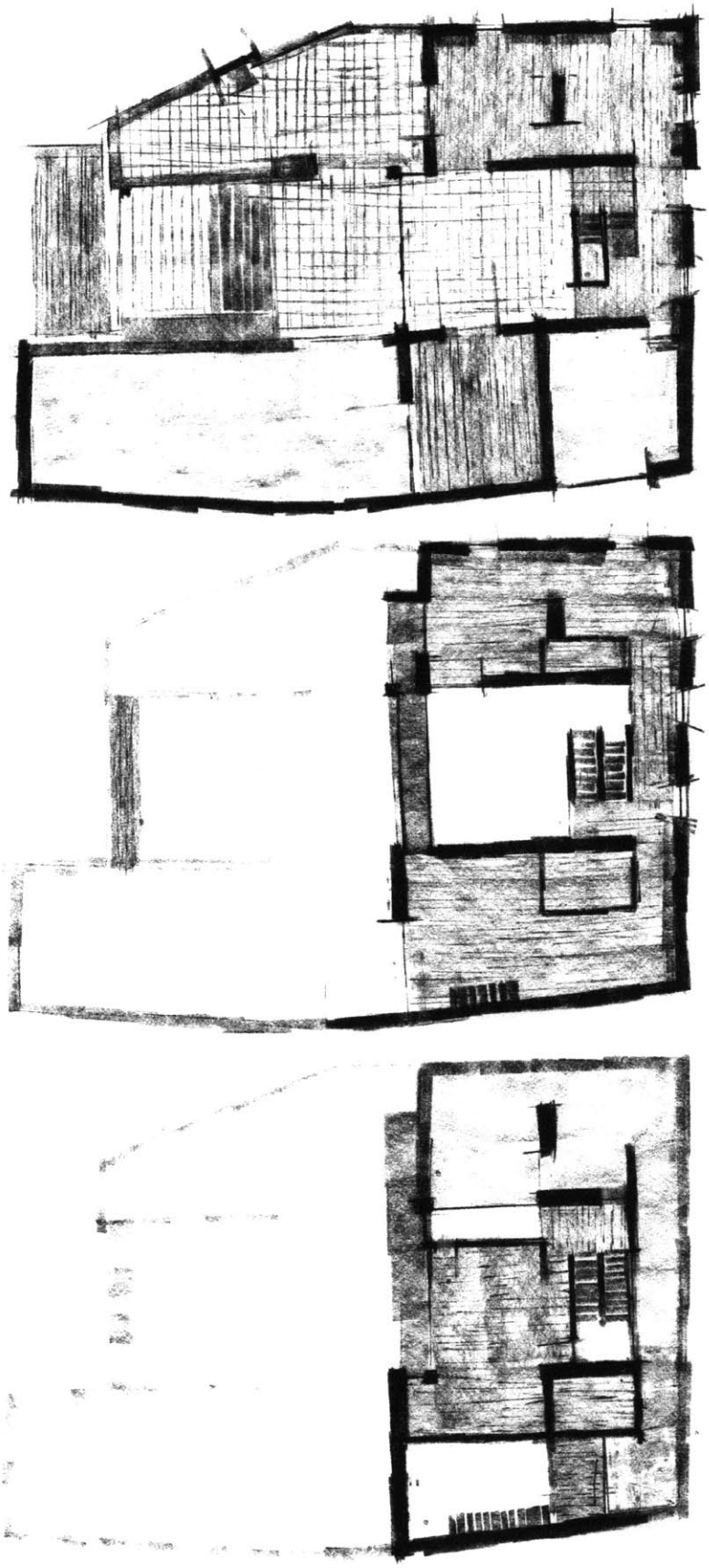
Drawings . pg 31
From top to bottom of page: Ground floor plan, second floor plan and third floor plan. (North is right)

The spatial layout of the newly designed house is U-shaped around a double height living room, which gives out onto the garden. The roof top terrace, on the third floor and the three bed room suits on the third and second floors all look down to the living room. Both the West side library, and the East side kitchen are on the ground floor and open into the living room in the center. The garage is located in the Northwest corner of the house.

Unfortunately, the house is currently in great disrepair – that is, in perfect condition for a thesis! It is my hope that the following images will tell the story of the redesign of this house. I have tried to make the writing as short as possible, leaving images of the places as descriptions of experience. (Unless otherwise noted, all models and pictures are of the redesigned house)





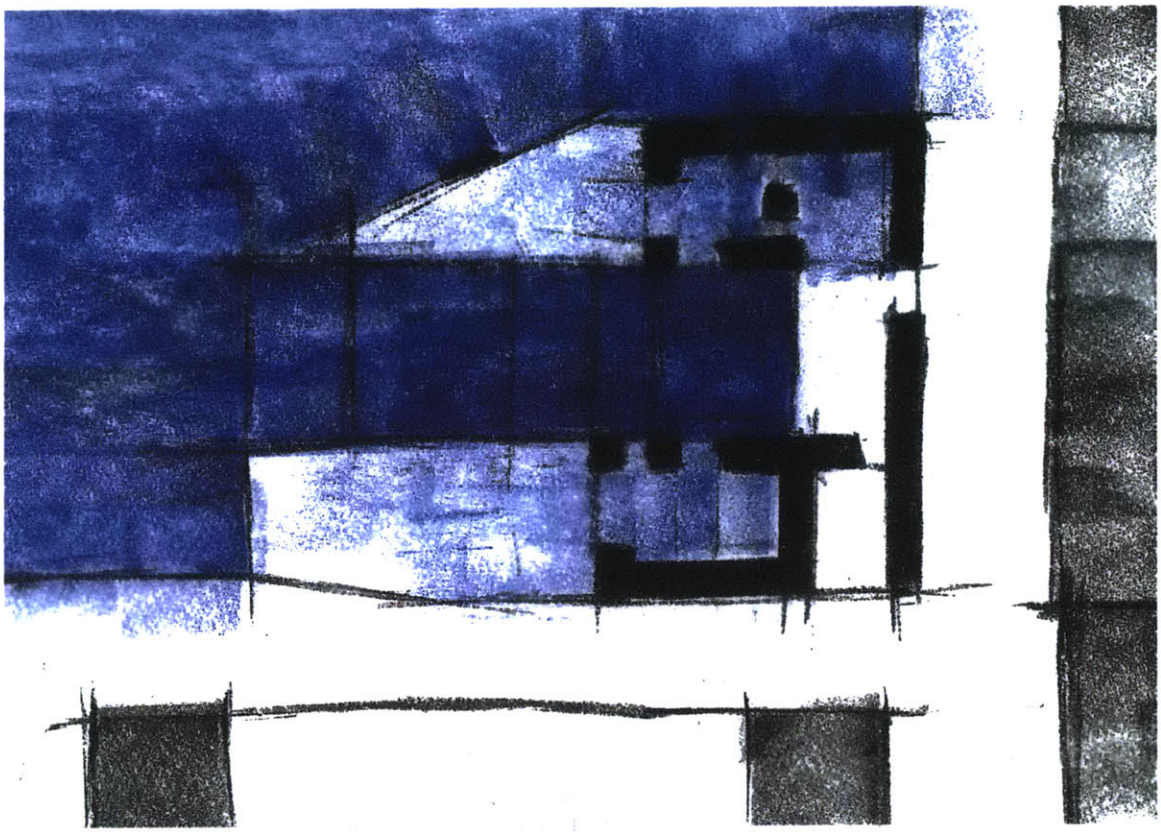


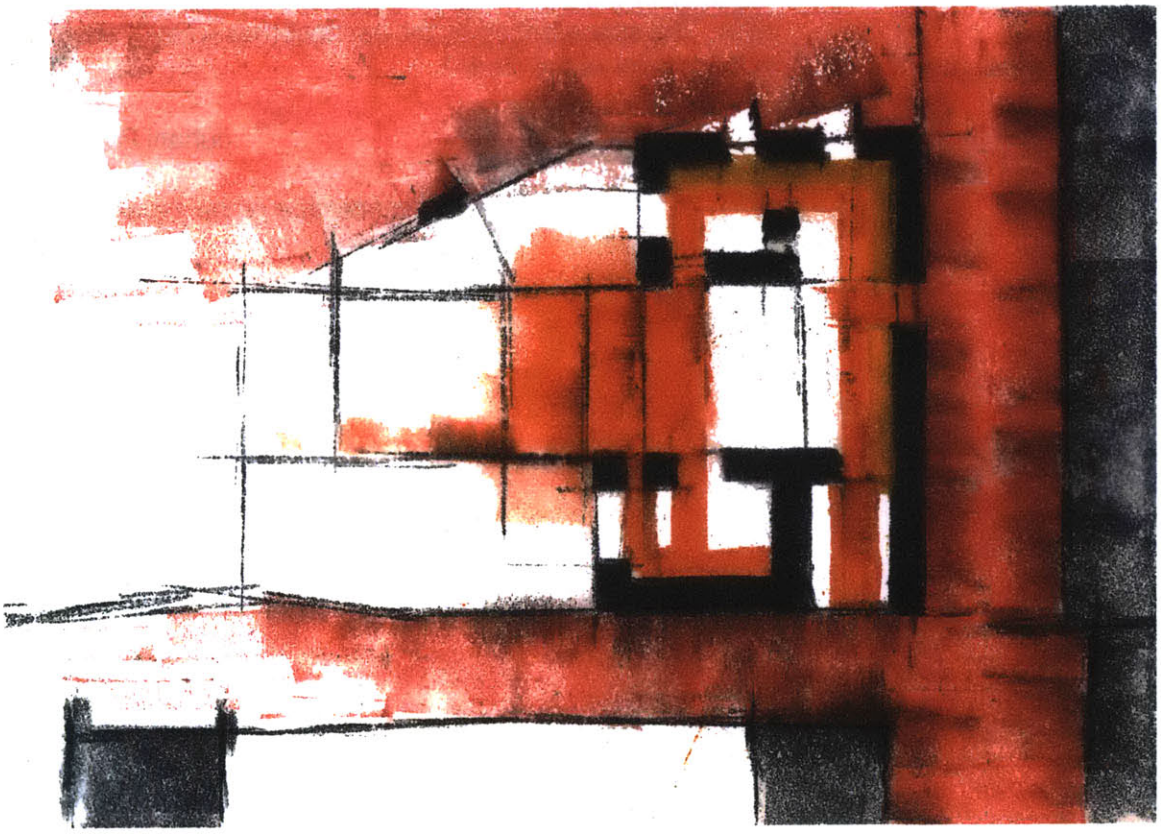
PHENOMENA OF SOUND

"Anyone who has become entranced by the sound of water drops in the darkness of a ruin can attest to the extraordinary capacity of the ear to carve a volume into the void of darkness. The space traced by the ear becomes a cavity sculpted in the interior of the mind."

Juhani Pallasmaa

An Architecture of the Seven Senses





The phenomena of sound are pervasive within all spaces of the house and are a major experiential presence both day and night. After having spent just a few minutes in the house one discovers that there are two distinct site specific phenomena of sound: one emanating from the river the other from the cars on the road.

As it stands the house's exterior stone walls and windows change very little as one walks around its periphery. However, local sounds exist in different locations, amplitudes and frequencies, and as a consequence some sounds penetrate more than others do. Unfortunately, the predominant sound within the house is that produced by cars and trucks passing in front of the North façade. The pleasant sound of the river is heard as one moves deeper into the house, away from the road and, then, only when cars are not passing by. The experiential distribution of these two sounds is mapped in drawings pgs. 37 and 39.

Top Drawing
Representation of river sound entering the redesigned ground plan of the house. (North is right)

Bottom Drawing
Representation of car sounds reflecting around the redesigned ground plan of the house. Ocre color represents two floors of bookcases which absorb sound that still enters the house. Orange color represents circulation path around perimeter of the house, creating additional spatial buffer zone from car sound. (North is right)

Drawing . pg 37
Study drawing of mixing sounds from the river (in blue) and cars (in red) entering existing ground floor plan of the house.

Drawing . pg 39
Study drawing of mixing sounds from the river (in blue) and cars (in red) entering existing North/South Section through the house.

What revealed itself to me through these two drawings is that the house needed some stronger and focused orientation. The water sound is a wonderful backdrop to the rituals we all engage in within the house: conversation, eating, reading and sleeping. As the sketches on pg. 34 indicate, I decided to first close the house down to the street and then open it up towards the rear garden and river.

Closing the House to the Road:

The North and West façades could not change very much, due to town regulations. I did however make several important changes to these façades. I discovered, in recordings around Harvard square, that when one sees the source of a sound, the sound appears to be louder than if the source were hidden. I took this discovery and eventually started by creating larger shutters on the West façade, that fold open towards the river. This movement allowed one to see the river but not the road, and allowed the sound of water to enter the interior while deflecting the sound of cars away from the openings. Smaller, low windows were designed bellow the existing windows on the North and West façades for specific reflected light qualities (see chapter on light) and views to the river on the West and people passing by on the North sidewalk.

All three bedroom suites are on the second and third floors, which are naturally more, quiet. The beds on the second floor suites, are located on the garden side of the rooms, away from the road.

Behind the North façade is placed the vertical circulation, creating an additional sound barrier. The horizontal circulation appears around the interior periphery, allowing one to experience all the exterior site conditions as one promenades around the house. This circulation also creates an additional buffer space moving the core of the house farther away from the street.

Two floors of bookcases behind the North and West façades (created for my family's extensive book collection) absorb sound that has entered the house and would otherwise reflect around. Additionally these bookcases, passing from bedrooms to circulation zones to the library, experientially unify disparate places within the house.

The garden, on the East, is acoustically protected from the road by a stone wall and to the West by a wood trellis.

Opening the House to the River:

The topography of the redesigned site gradually steps down from the North road to the South river. This allows sound from the river to move up, unimpeded, through the garden and into the living room space where the river sound is then redistributed between all other spaces.

All three bedrooms, the library, the living room and the kitchen are almost completely open to the South garden and river. This allows every room in the house (except the garage) to maximally receive sound from the Charente river. Each room has its own unique way of opening up to the garden and river. The third floor bedroom suite opens onto a flower deck to the South and can easily access the outdoor terrace to the West. The West bedroom suite opens onto a balcony facing the garden and bridge that links up to the master bedroom suit on the East. The East master bedroom suite has a balcony, the bridge (previously mentioned) which looks into the living room, and stairs which lead to an outdoor walkway and eventually the third floor outdoor terrace. Both the library and kitchen step right out into the garden from large openings.

In addition to opening up onto the garden and river, all the rooms are in a U-shaped spatial layout around the living room, and all look into the living room. This means that all places within the house can be unified acoustically. This shared acoustic experience is important in making people feel as though they are part of a communal ritual.

Model . pg 41
South (garden) and West façades facing the river.

Model . pg 42
East façade with the garage door facing a side street and neighboring buildings.

Model . pg 43
Public North façade facing the main road. The outdoor walk to the roof-top terrace is above the North façade. Bellow is the plan view of the house. (North is right)

Model . pg 44
Stair core against the North façade. Bellow is a garden view to the outdoor table and foot bath.

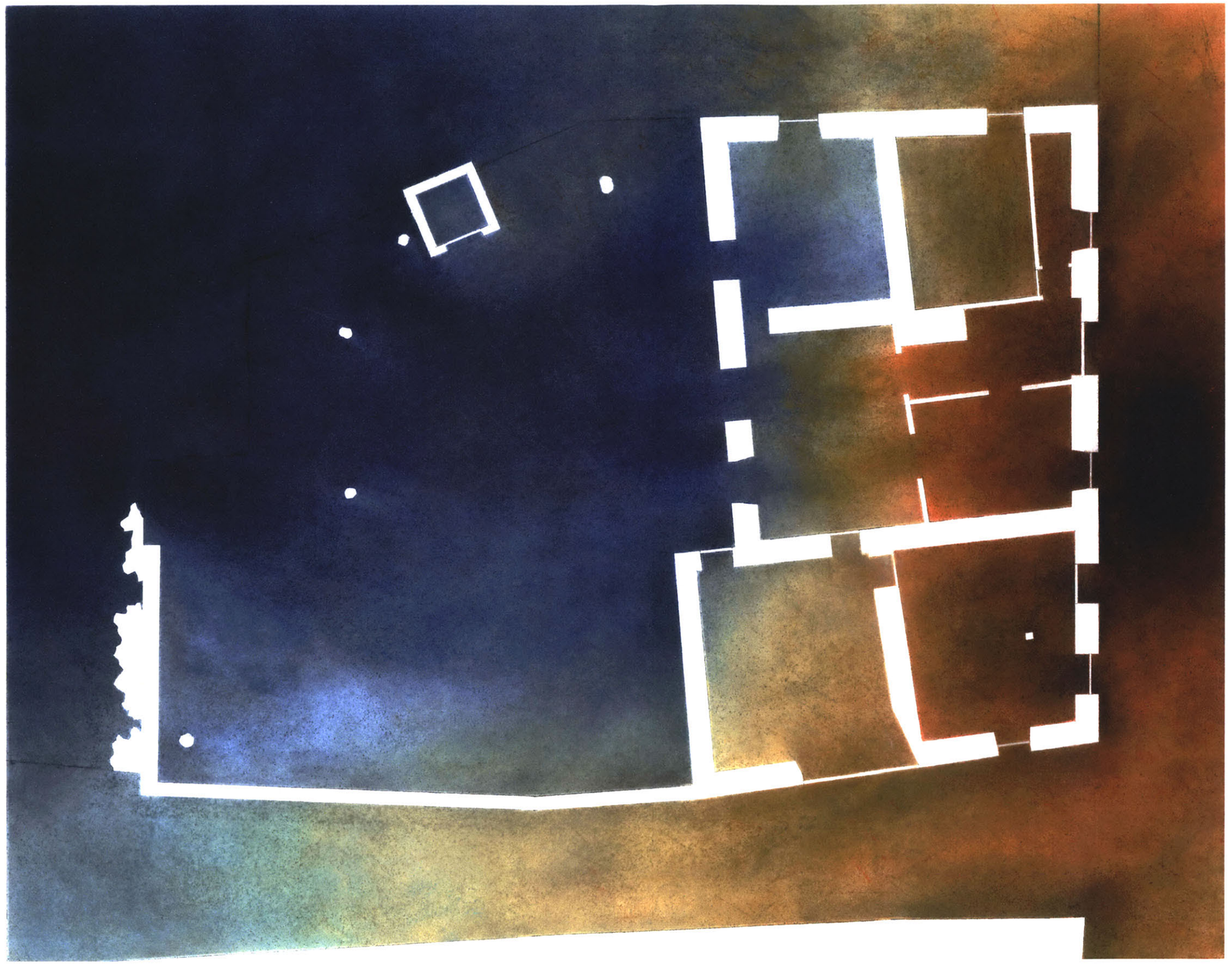
Model . pg 45
Windows to master bedroom above and kitchen bellow, looking onto garden dining.

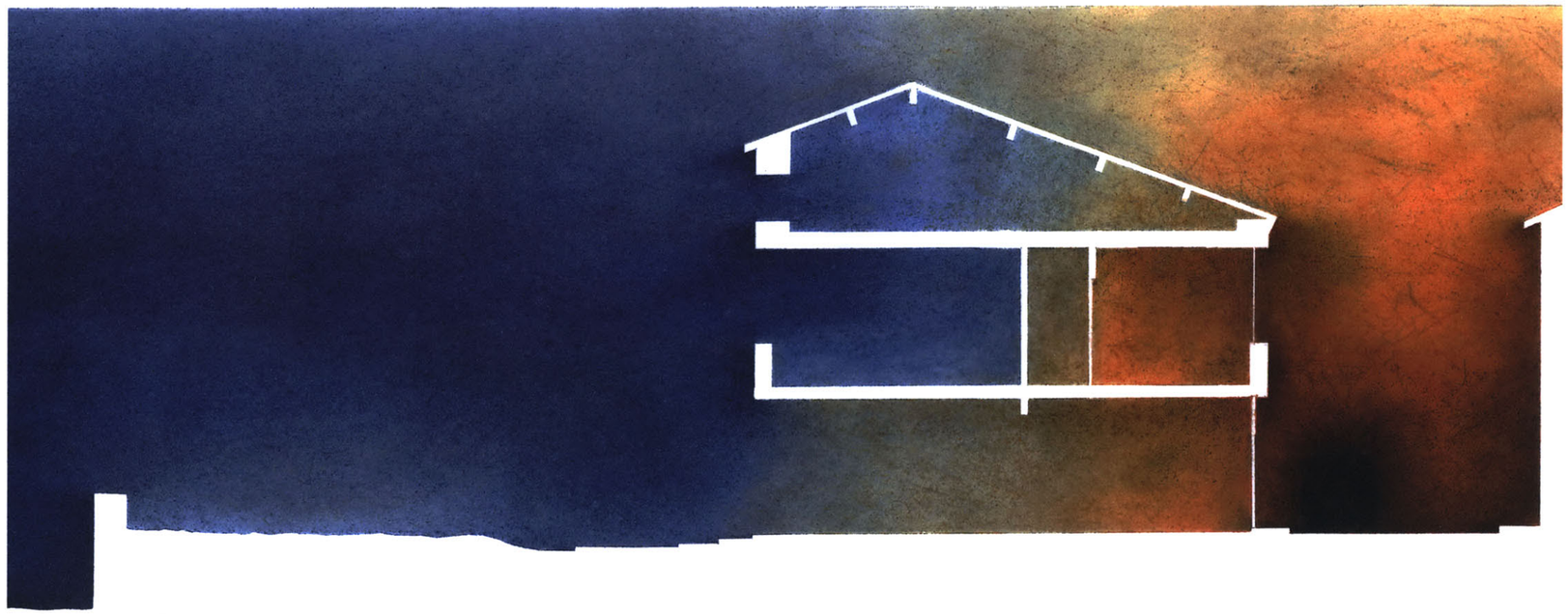
Model . pg 46
Ladder to a bedroom on second floor with library bellow and bridge connecting to master bedroom. The double height living room is right of the library.

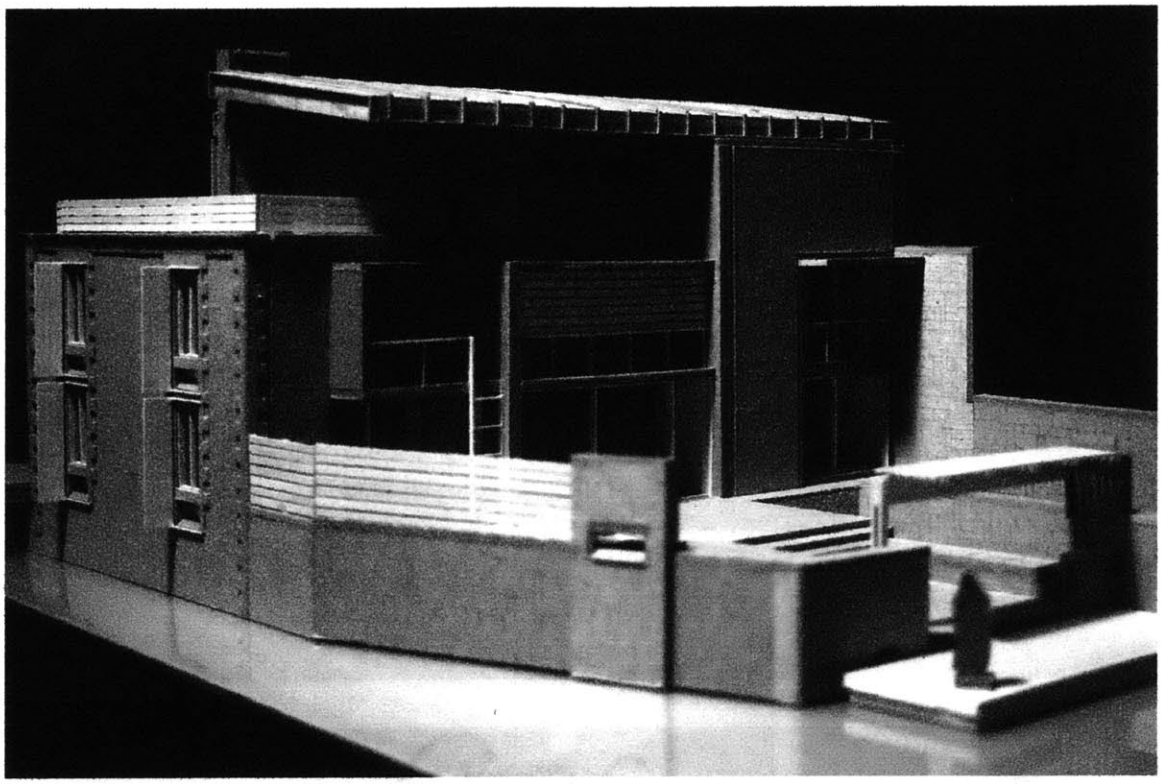
Model . pg 47
West façade with roof-top terrace above.

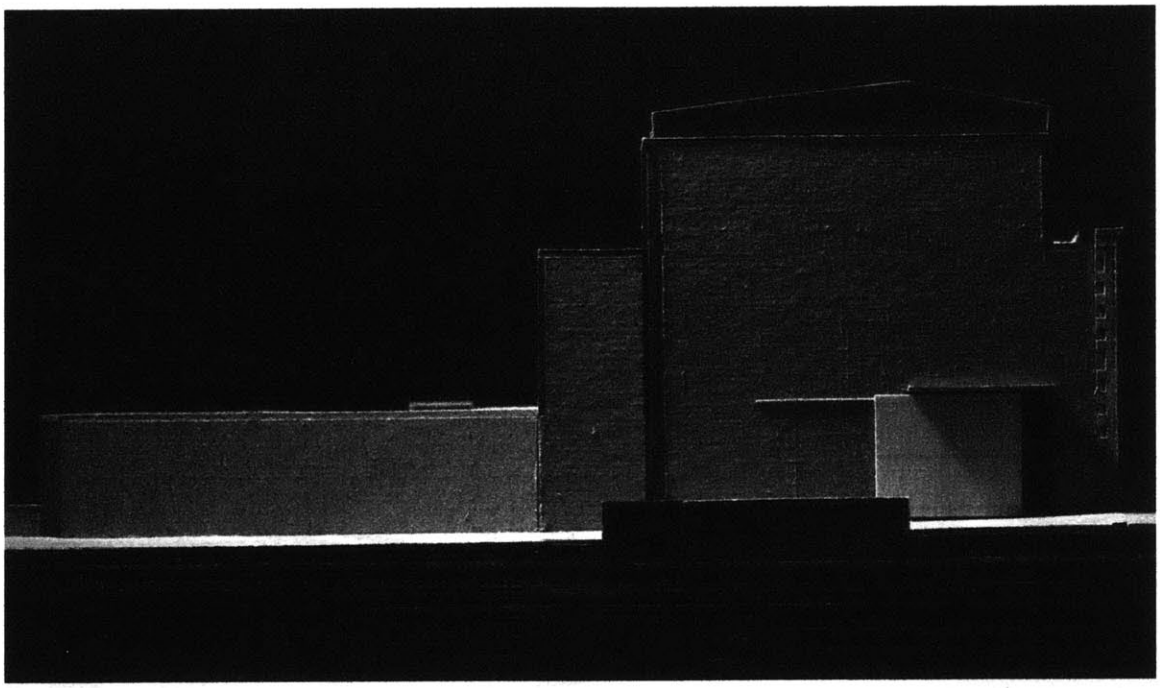
Model . pgs 48, 49
Details of a West façade window.

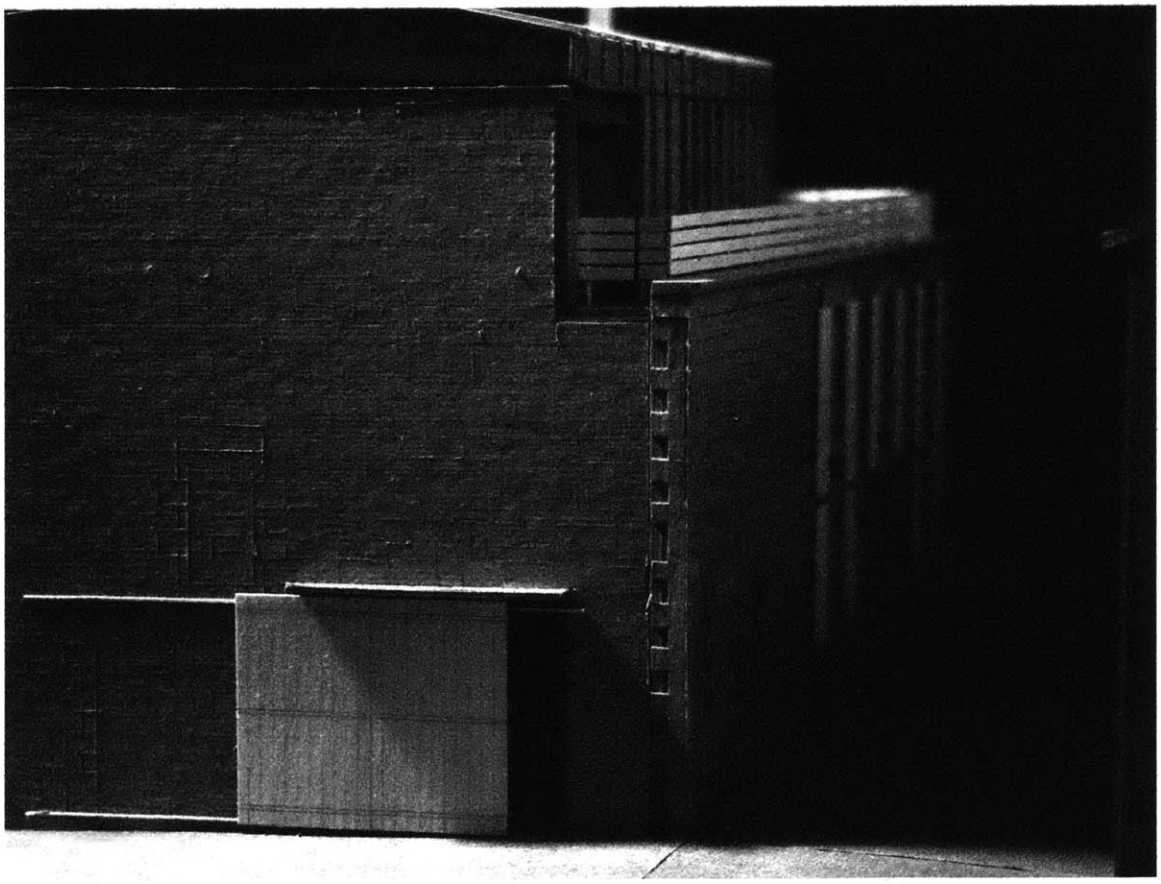
Model . pg 50
Two stories of bookcases around West and North interior walls (all three floor plains are missing). Bellow is a view of the bookcases in the first floor library.

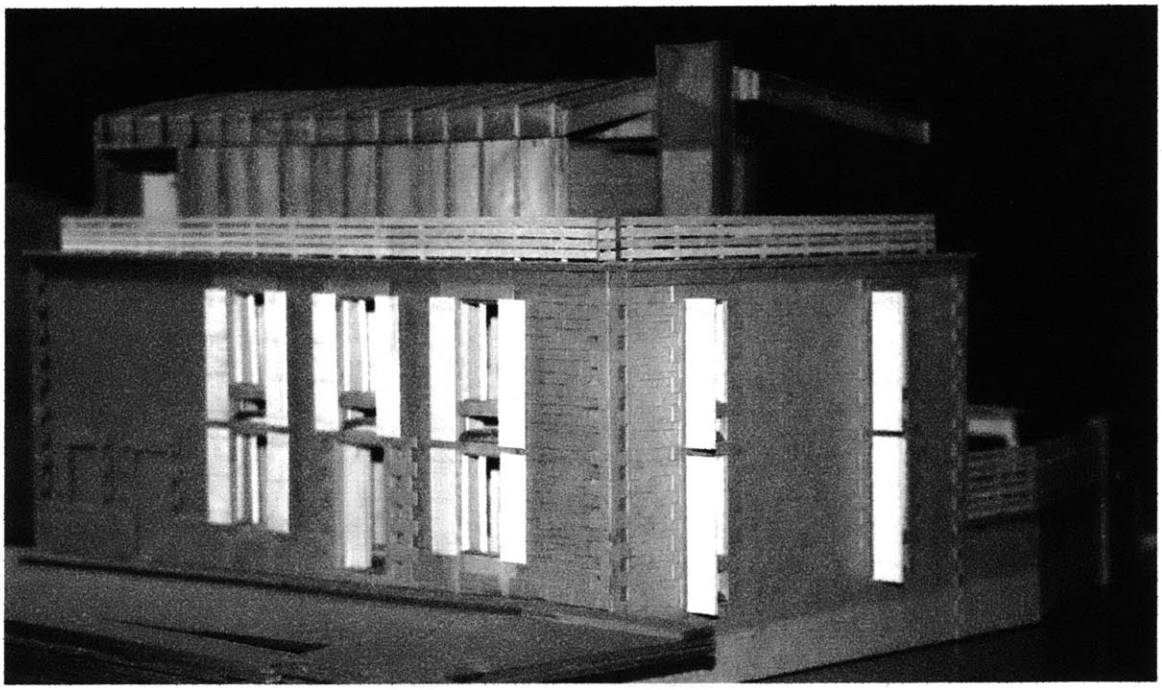


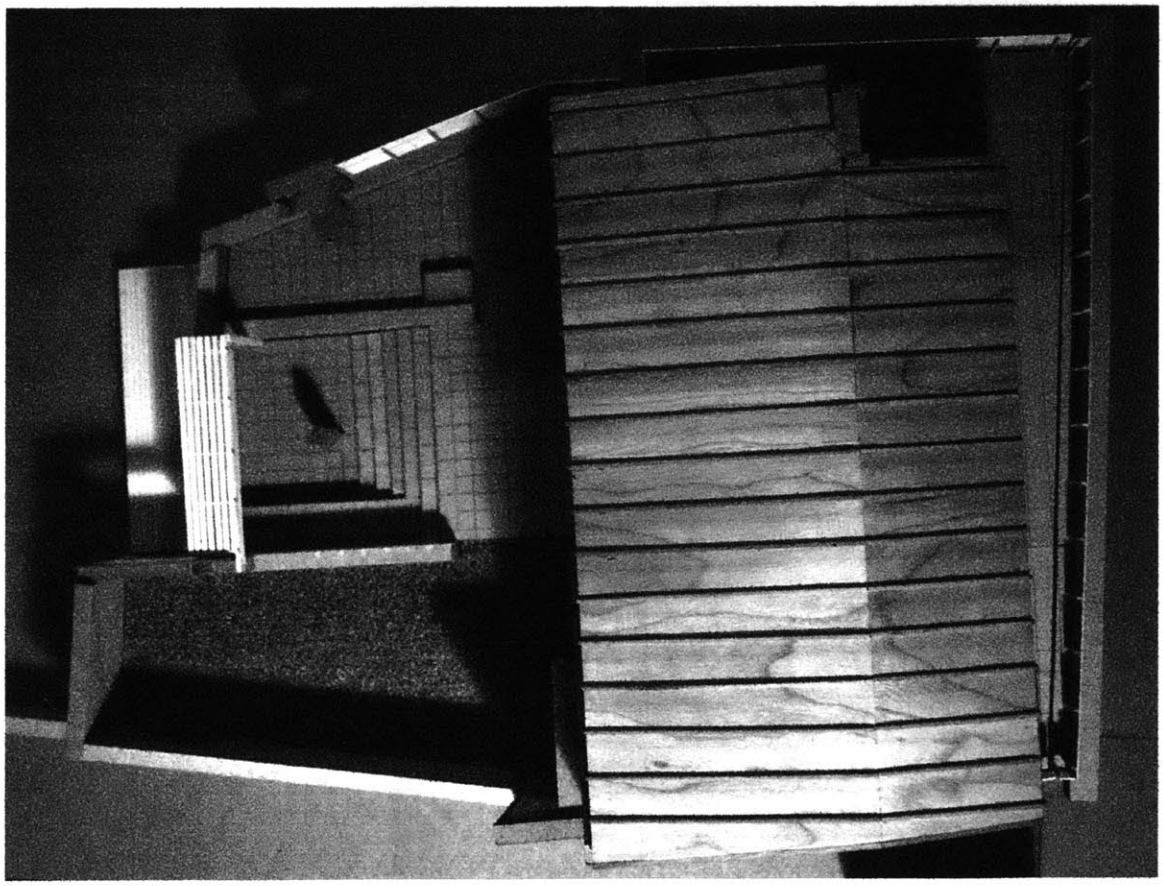


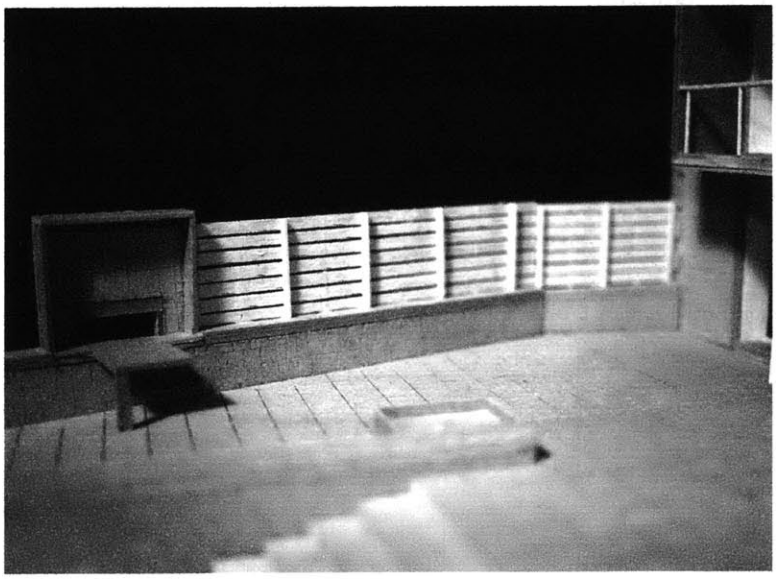


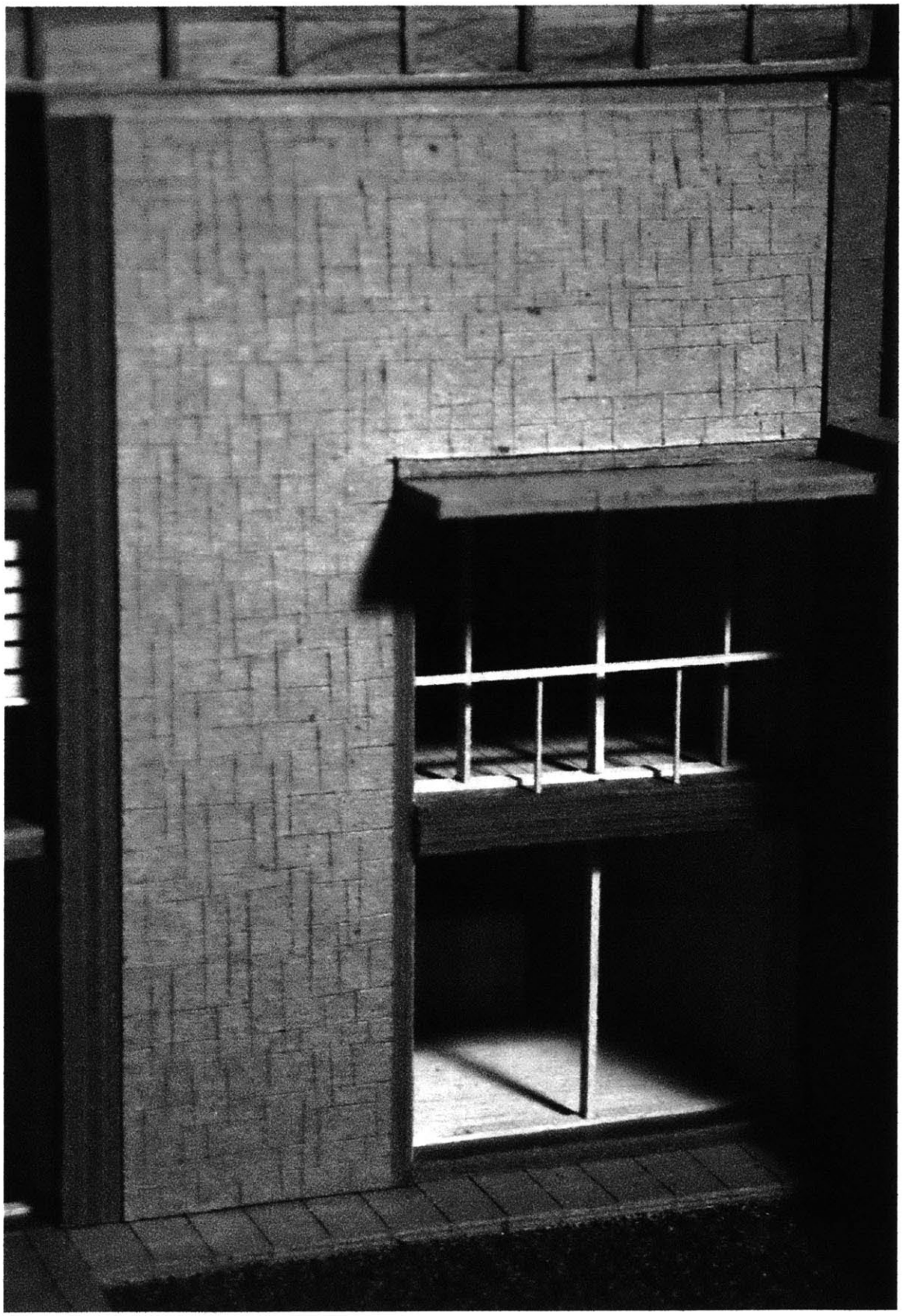


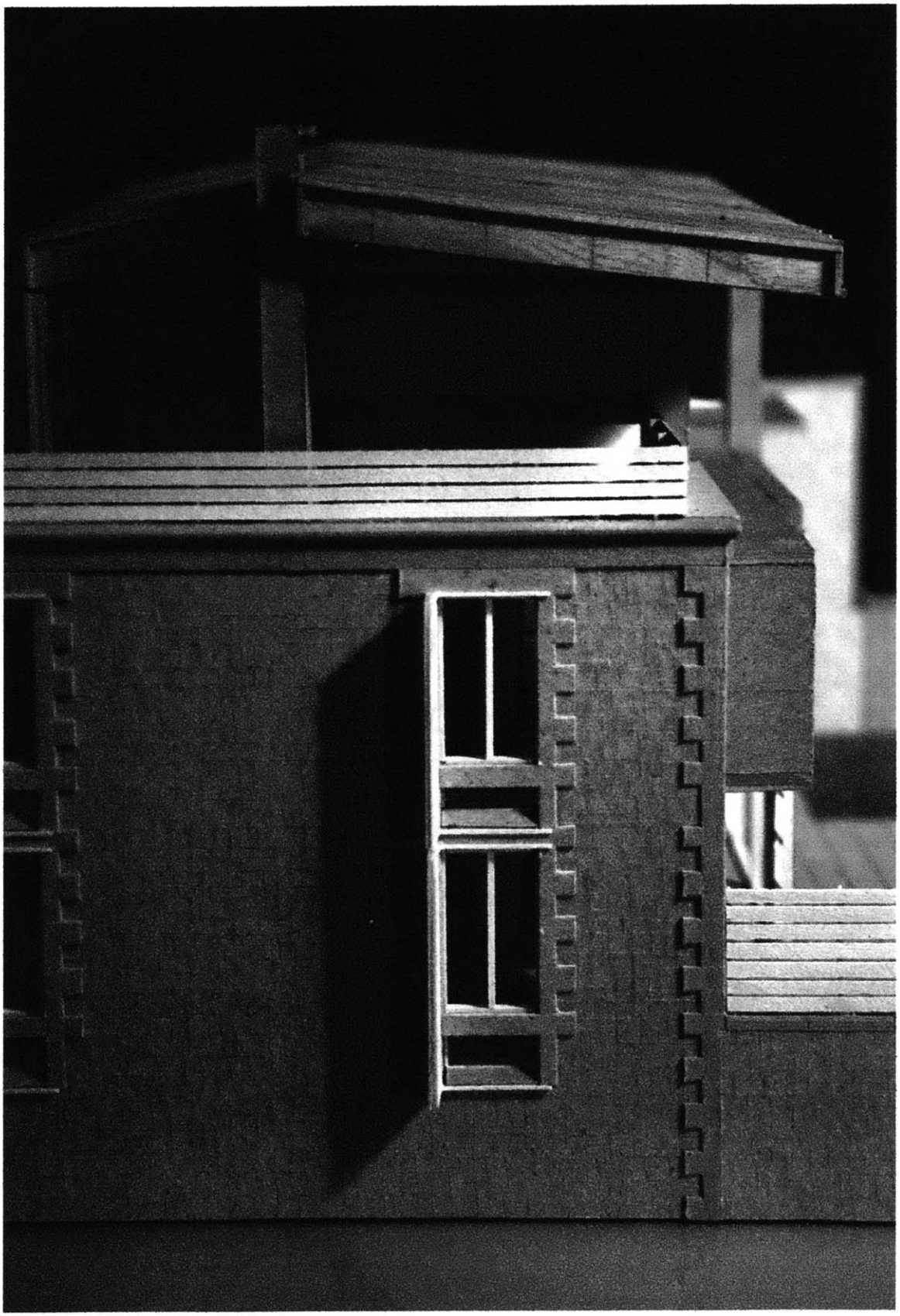












PHENOMENA OF LIGHT

"The sky is the sun's path, the course of the moom, the glitter of the stars, the year's seasons, the light and dusk of day, the gloom and glow of night, the clemency and inclemency of the weather, the drifting clouds and blue deapth of the ether."

Martin Heidegger

Poetry, Language and Thought

In thinking about the phenomena of light and the way in which they are filtered from the exterior to the interior of the house, I looked to the surrounding stone buildings in town. With just one exception that I could find, I realized that the buildings were all receiving light through controlled openings in their walls and not from overhead. This is partly due to available construction techniques and the fact that the townspeople want shade from the sun during the long hot summer days and warmth in the mornings, evenings and winters. In this respect, the interior qualities of material and place are revealed through these openings on vertical surfaces. I found that during the heat of the day, rooms tended to stay cool with no direct sunlight penetrating deep into the spaces, while in the morning and evening sunlight hit much deeper in the spaces, warming them up. I wanted to maintain these preexisting sensibilities to light (and temperature).

I started this exploration by looking at the existing reflected light on the West side of the house. This side of the house has a unique condition where early evening light, from 3pm to 6pm, reflects off of the river and bathes the first and second floor ceilings with ever lengthening swatches of reflected light. This light is wonderful to read and daydream under. To intensify this reflected light quality, polished wood panels were designed on the ceilings in front of each of the West facing windows. Additionally small windows were opened beneath the larger window lintels, bringing in more light and a view down to the river. The large shutters on this façade both block views to cars passing over the bridge and reflect light to the interior.

Drawing
Sectional exploration of reflected light entering the redesigned West side rooms (library and a bedroom suite).

The bulk of the light received in the house enters through the South wall where views to the garden and river beyond exist. The large openings on this side are all protected from midday summer sun with shading structures. Because Verteuil's latitude is so far North, the sun's altitude at noon in December is only 20°, and therefore would enter deep into the house, warming the stone ground floor and wood upper floors (see section drawing pg. 55).

Drawing . pg 55
Lateral Section through living room of the house with December sunlight at noon. At the top is one of the bedroom suites. To the right is the peripheral horizontal circulation.

As an aside, it was an interesting construction exploration trying to make large openings in the South stone façade. It led to an overall change in the construction of several walls. While the house floors are redesigned with oak planks and limestone tiles, and the roof with copper, the stone walls became a combination of lime stone and concrete. Concrete supports all openings in the South façade, as well as joins perpendicular walls and coats the top surfaces of some walls. The concrete acts, in many cases, as both a support material and

Drawing . pg 57
Multiple perspective views of layered spaces, from the North side of the house looking South toward the garden. All three floors of the house are depicted.

Drawing . pg 59
Three drawings of a single small window on the West façade. These were studies in views and reflected light from inside and outside the house.

weather protecting material. One could look at the construction of these hybrid walls as concrete grids with in-filled limestone. Because stone walls are more structurally sound when they are connected at both ends to other perpendicular walls, all of the walls in the house are connected in this manner, whether directly with another wall or through concrete beams.

Mentioned previously in the sound chapter, all of the spaces within the house are connected to the double height living room. Not only are there acoustic connections but strong visual connections from balconies and other large openings. There is, of course, the possibility to close the various rooms off from one another, but one would still feel connected to the heart of the house.

As one moves vertically through the house, there is the possibility to view farther out. The rooftop terrace was conceived of as a place for gazing both horizontally to the castle, church and fields beyond and vertically to the stars and moon. Because there is so little light pollution, summer nights in Verteuil offer wonderful opportunities to watch meteors and stargaze.

Model . pg 61
West façade window details. first floor West library and second floor West bedroom suite.

Model . pgs 62, 63
View from the library. Section through the library and second floor bedroom suite.

Model . pg 64
Third floor bedroom suite.

Model . pg 65
Roof-top terrace and doorway to roof top terrace. Third floor bedroom suite would be to the left of this doorway area.

Model . pg 66
Chimney detail on roof-top terrace.

Model . pgs 67, top 68
Garden trellis details and lower garden terrace with the wood dock in front.

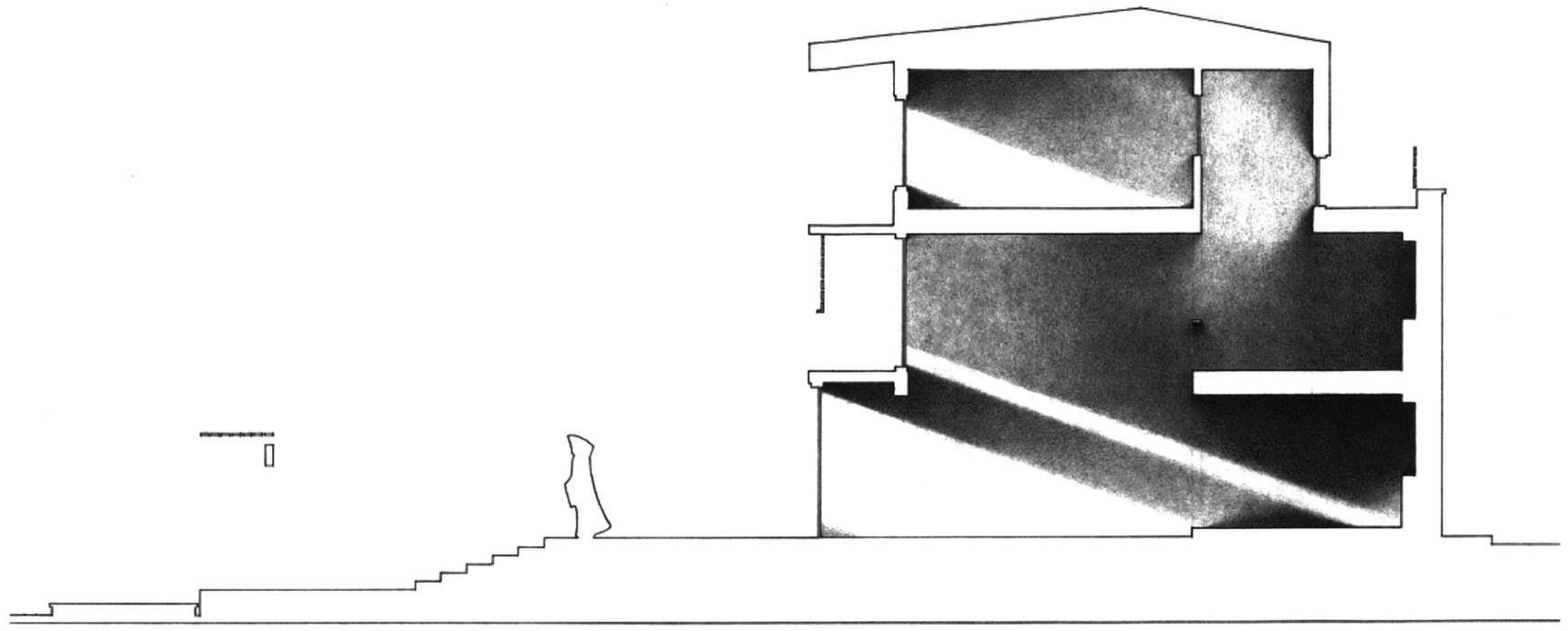
Bottom Model . pg 68
View to double height living room from garden.

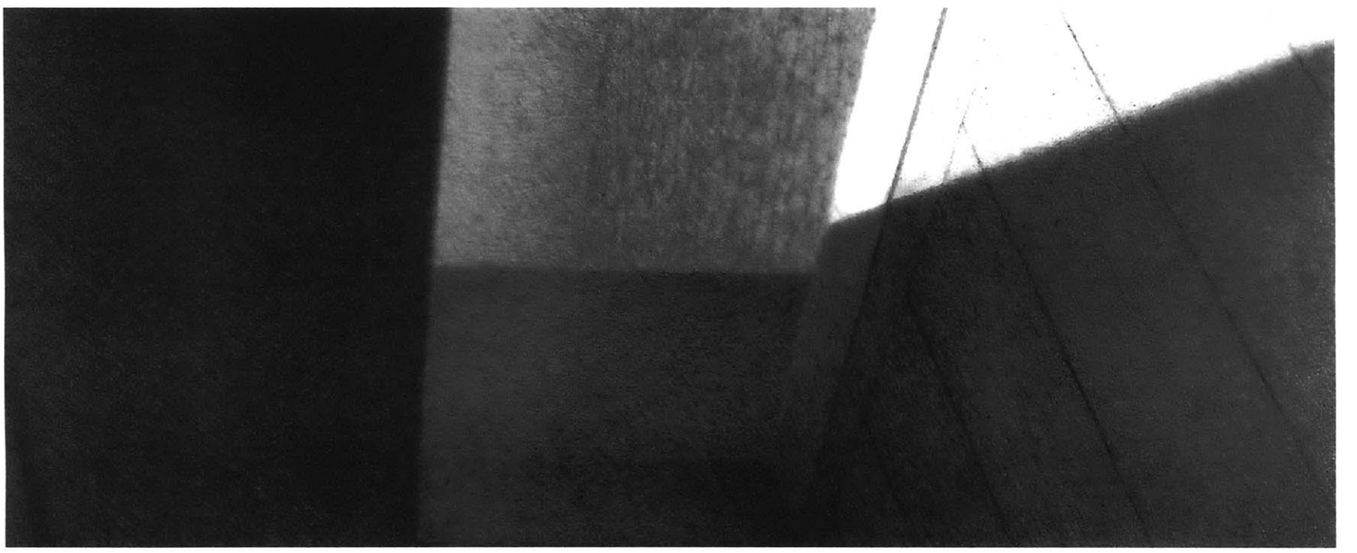
Model . pg 69
Transverse section through master bedroom suite, kitchen and garage to the lower right. View from the master bedroom suite, under the loft.

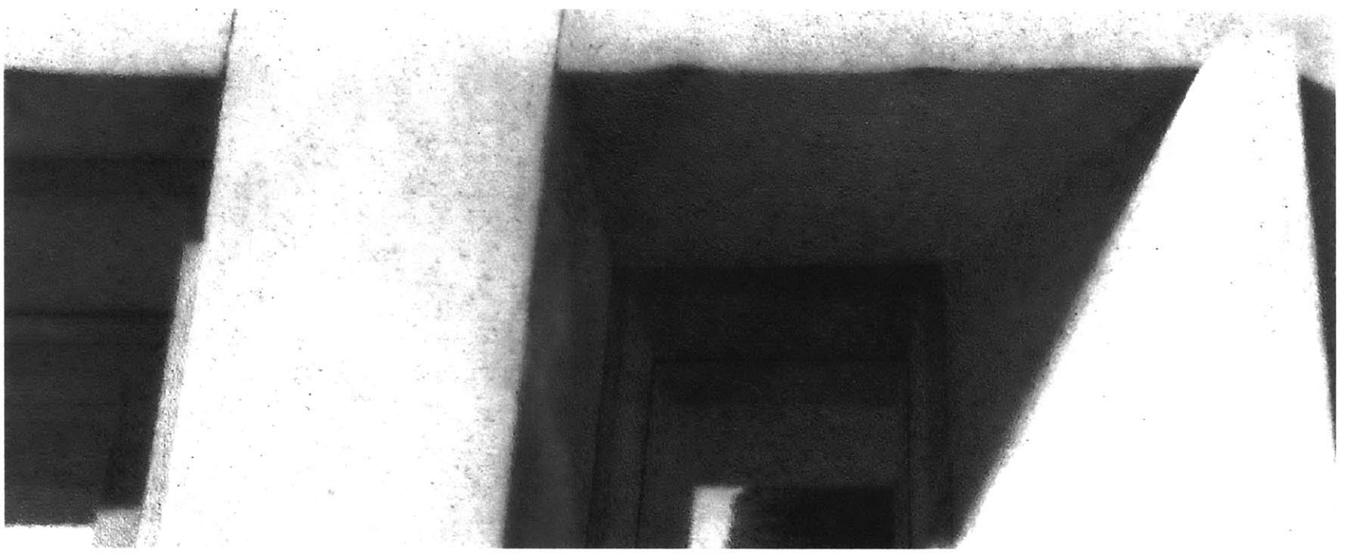
Model . pg 70
Stairs going up to loft in the master bedroom suite. The loft leads to an outdoor walk and roof-top terrace.

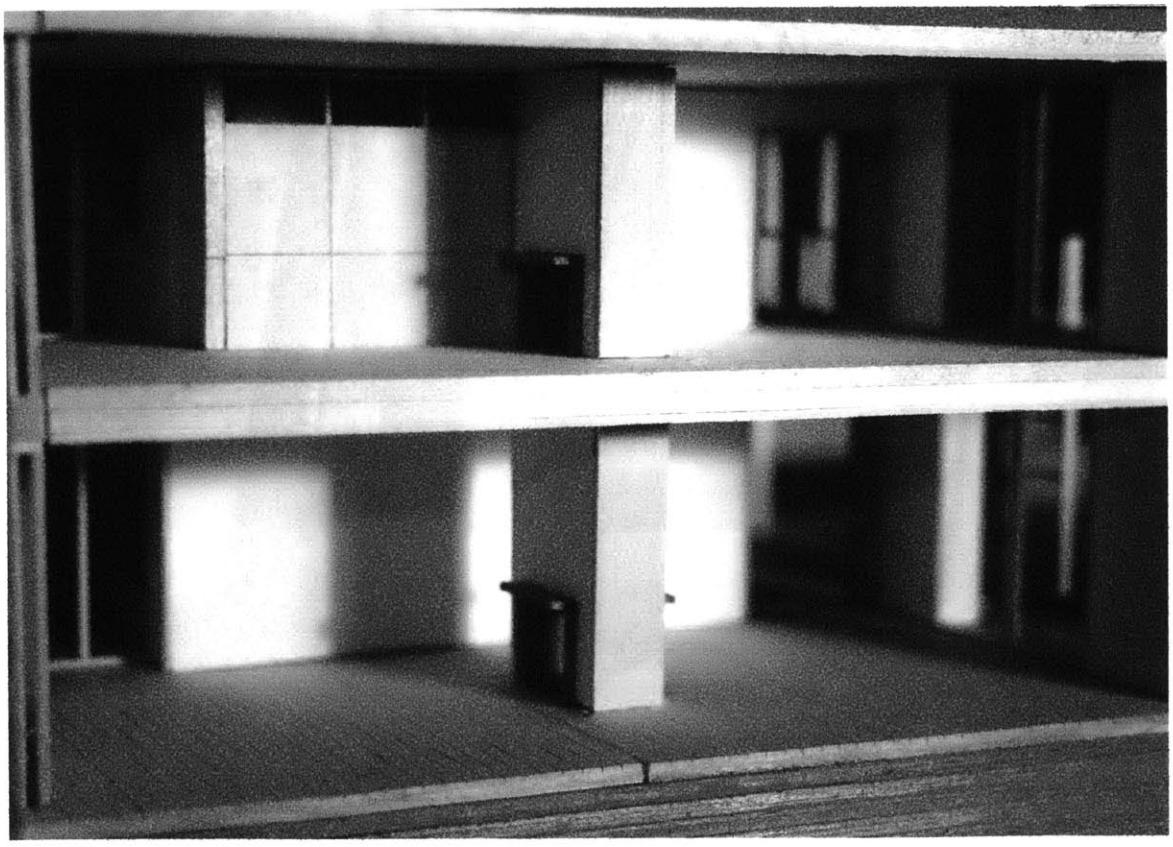
Top Model . pg 71
View from loft in the master bedroom suite.

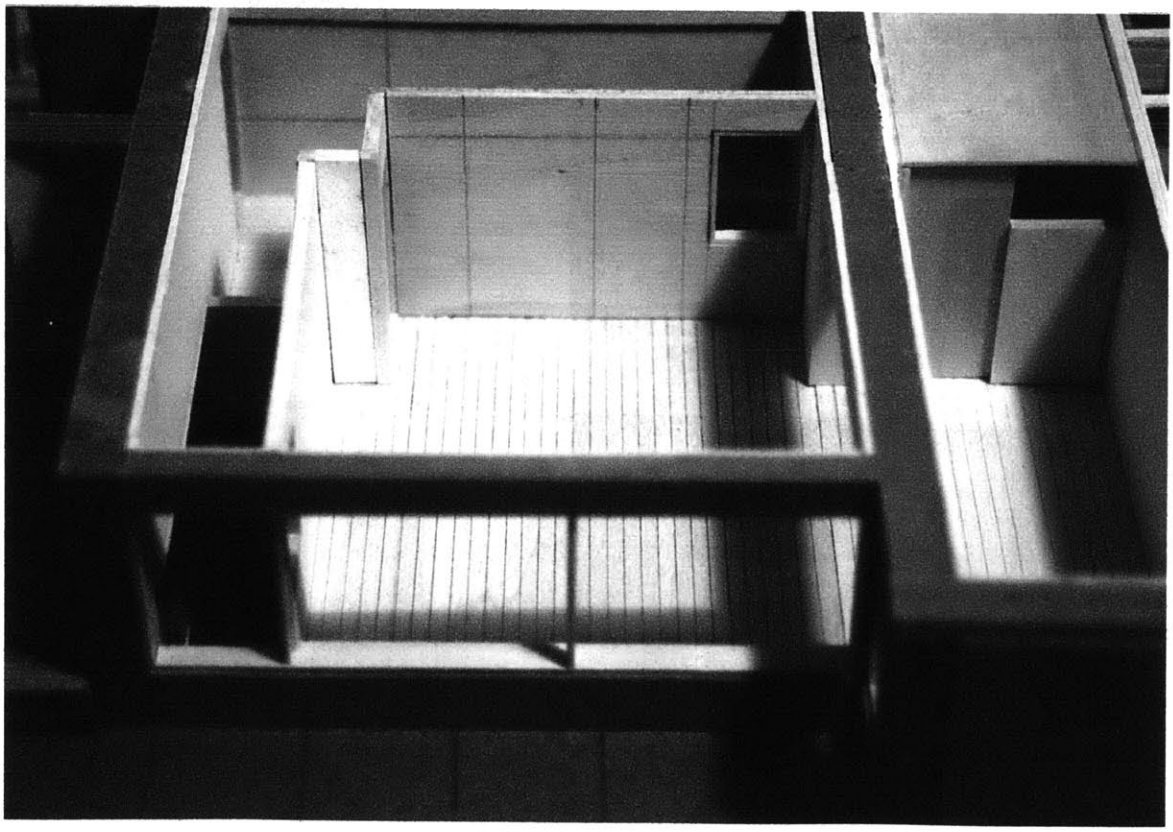
Bottom Model . pg 71
View from the kitchen.

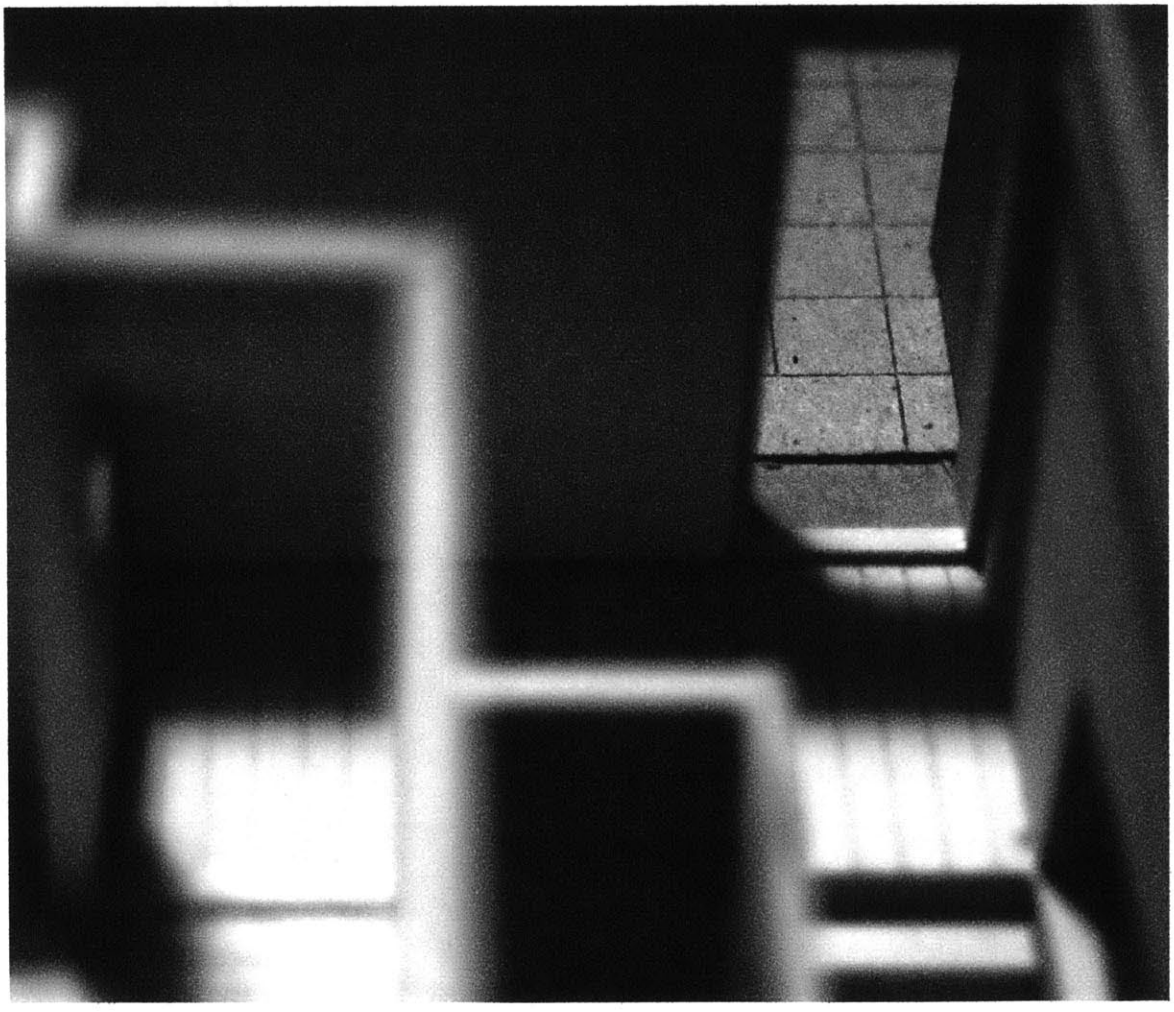


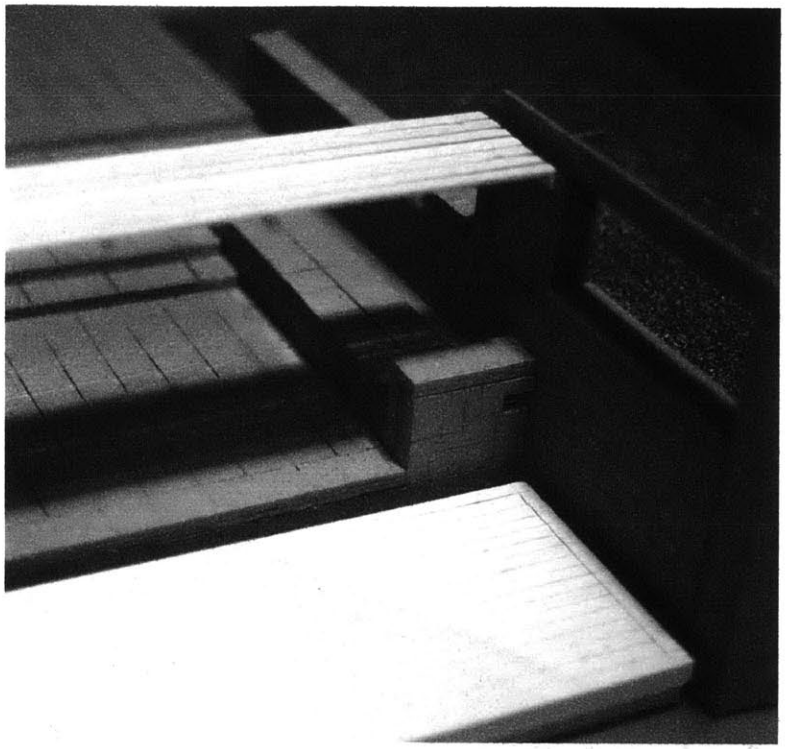


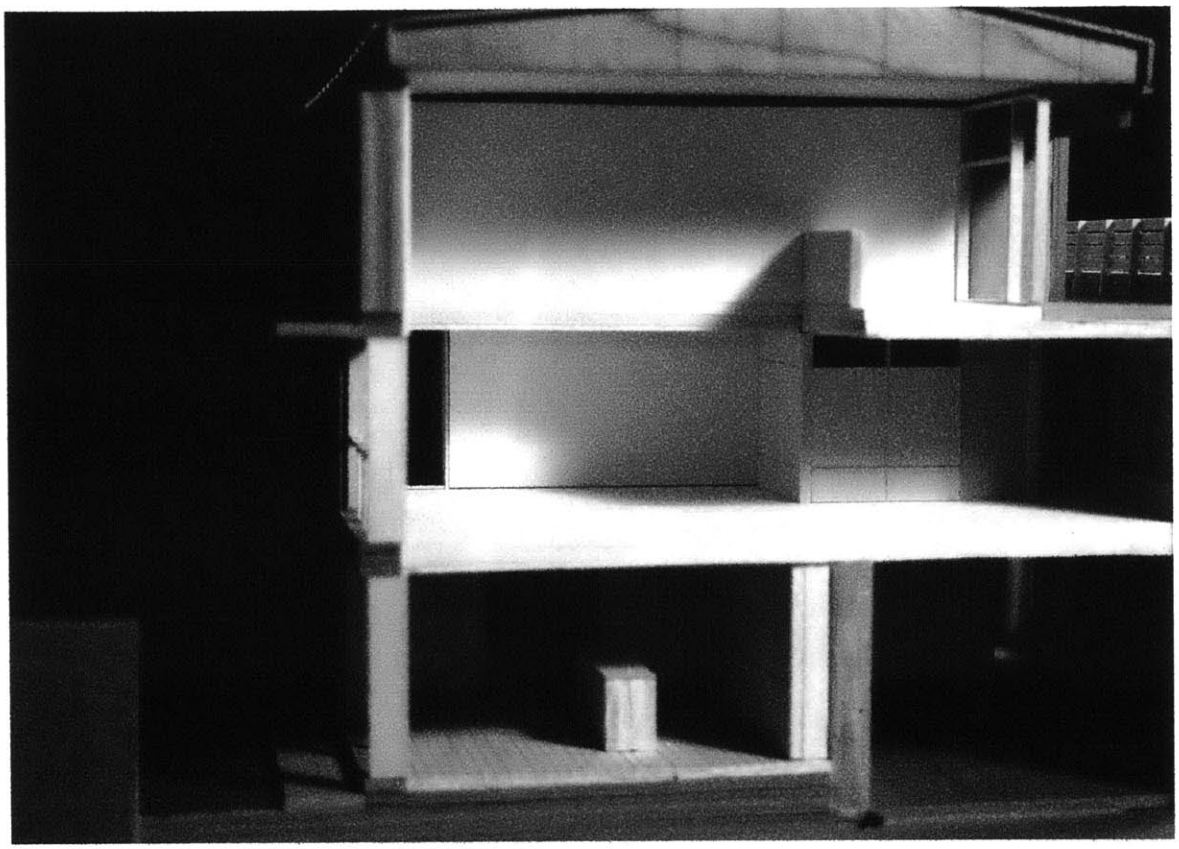


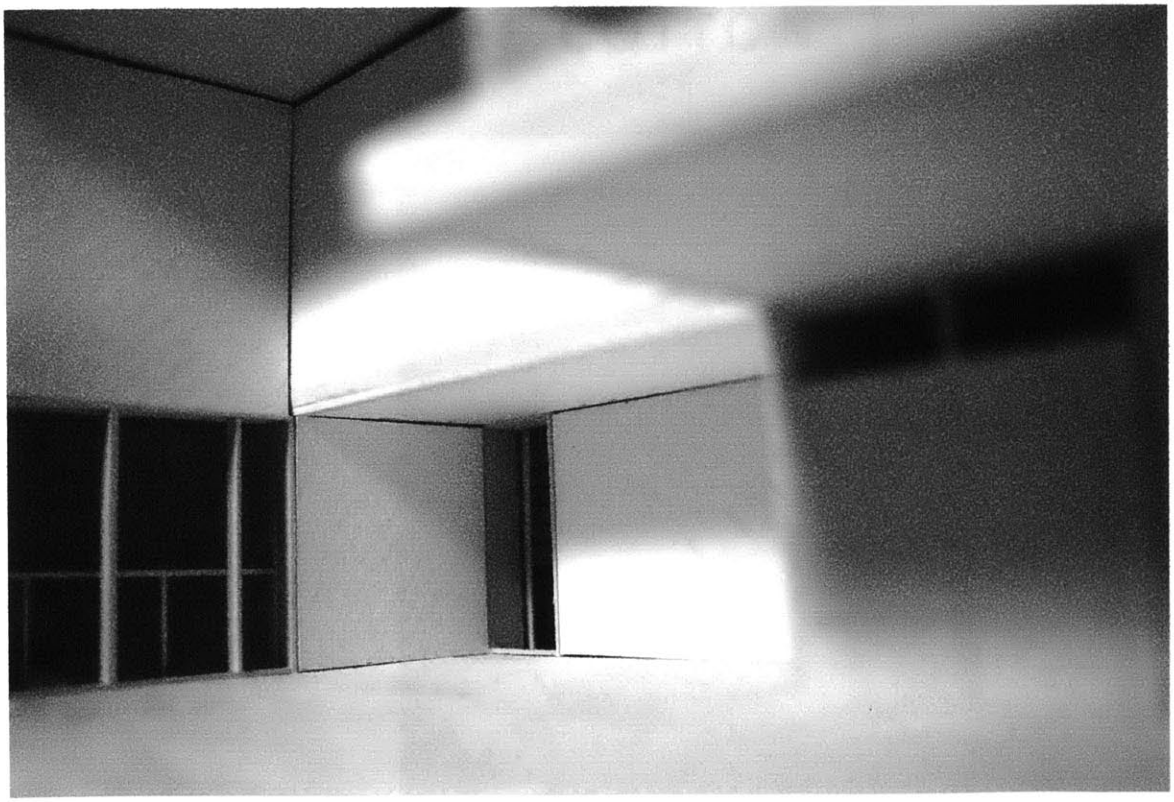


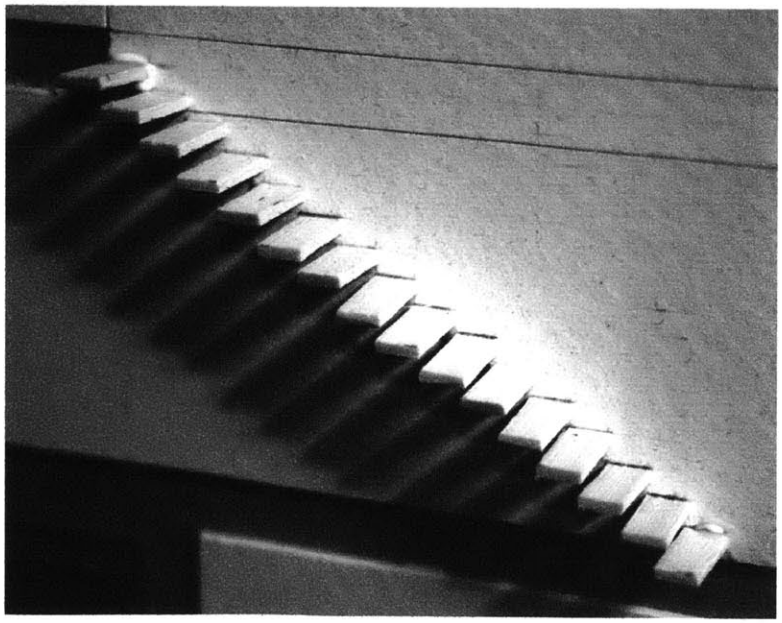


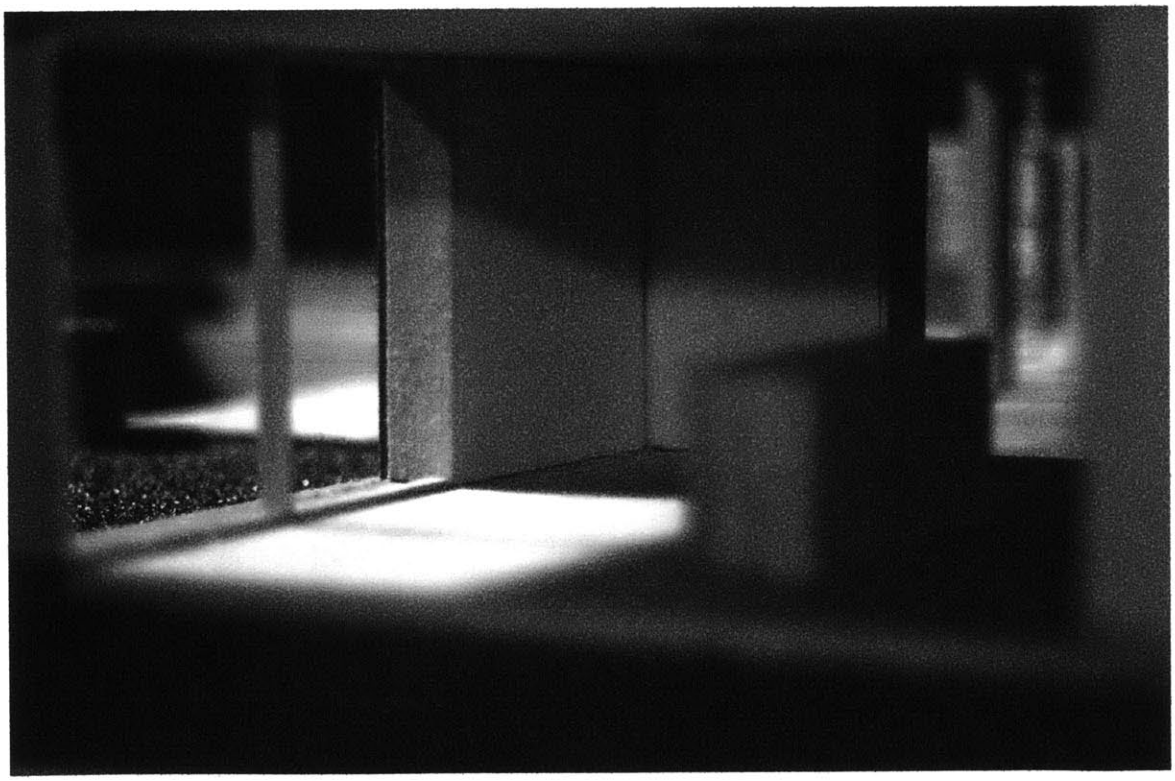


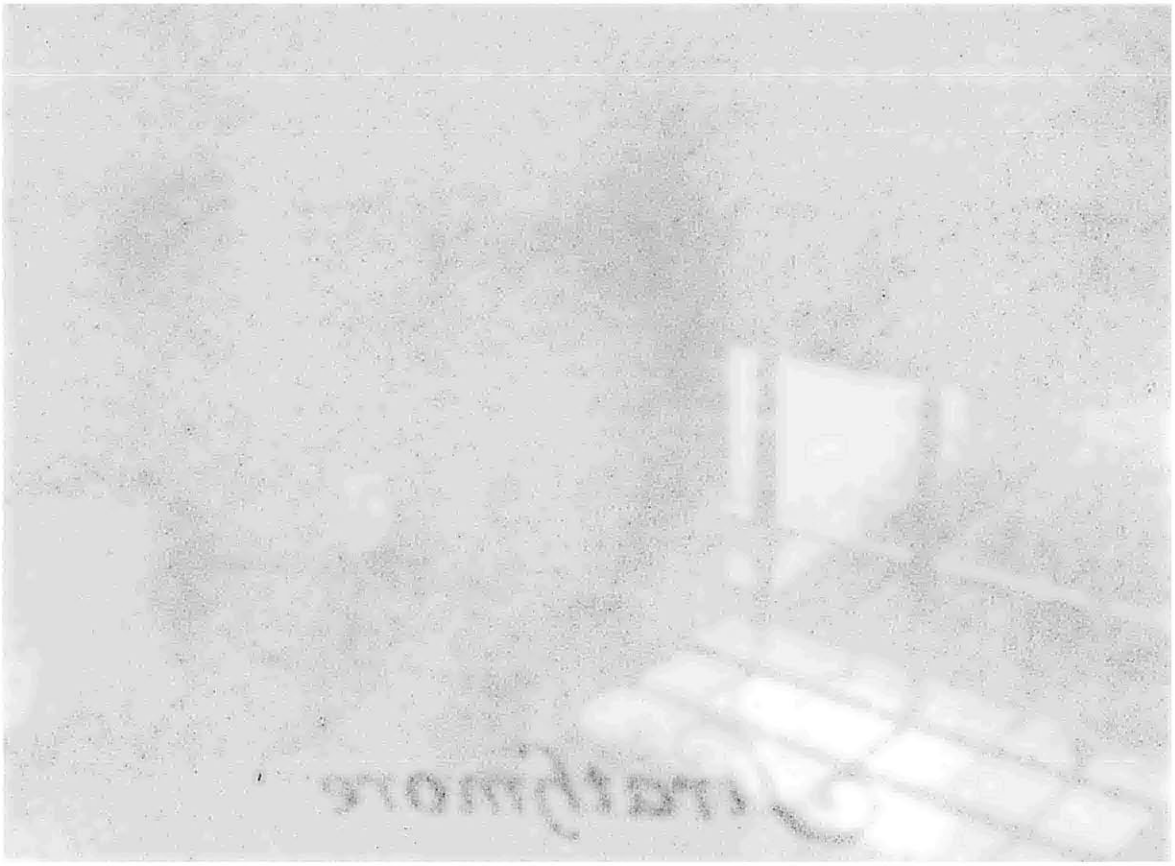












SOME AFTERTHOUGHTS

"Thus, by approaching the house images with care not to break up the solidarity of memory and imagination, we may hope to make others feel all the psychological elasticity of an image that moves us at an unimaginable depth."

Gaston Bachelard

The Poetics of Space

It is important in life (because it puts smiles on our faces) to keep exploring, and in doing so, surprising ourselves with unexpected discoveries. This house, I hope, is a place of unexpected discoveries where we can dream and imagine the way we did as children. Whether, one likes to sip port over cheese and a game of cards sitting beside the Charente river or watch meteor showers in summer on the roof-top terrace, this house was, for me, an exploration in making places that remain in our memories for a lifetime.

Making such places is no small task, as so few in our day to day lives leave any lasting impression. However, we all have a very powerful tool at our disposal: our personal memories. Reaching back to our earliest memories, we may find experiences of places and phenomena explored by unburdened minds and eager, receptive senses. It is these memories of rituals that hold rich possibilities for meaningful place making.

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