Response to the Sun
by
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“When the sun is warm on my face and the breeze is cool, then I know that it is good to be alive...”

Lisa Heschong
This thesis is an attempt to address the phenomenon of the sun in architecture. Particular use is made of the notions of warmth, light, shadow and energy as form generators. Of specific concern is how one structure can work in harmony within its environment and existing constraints.

An analysis of an existing building is performed, with an eye to its strengths and weaknesses as a residence. It is an interesting challenge for an architect to take an undistinguished building — one designed for a bygone age of surplus energy — to identify those substantive elements to be retained and reused, those which are to be eliminated or substantially altered, and then harmonize them, in conjunction with a new plan, in order to create a warm, energy efficient, aesthetically appealing, and ultimately livable family residence. The possibilities concerning the highest and best changes to be made to improve the use of an existing structure are first identified.

This thesis shows how a physically and spiritually cold, unattractive, and unremarkable building, one of little or no architectural merit, can be transformed — through improved natural light and heat — to create a better environment for a family.
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Idea of the Project
This thesis employs the phenomenon of the sun to enhance domestic architecture. It demonstrates how notions of warmth, light, shadow and energy can be used as form generators. As with any pre-existing structure, the challenge is to create greater harmony within an existing set of environmental and edificial constraints.

The average residential dwelling in the United States that was built within the past fifty years were built in an era of laughably cheap and abundant energy. Because of this cheapness and abundance, those structures have, for the most part, favored the ‘open’ plan. By contrast, earlier houses were greatly compartmentalized due to formal traditions which originated out of the need to heat rooms individually in colder climes, or shelter rooms from the heat in warmer climes and seasons. Today we find the basis of older rationales in domestic architecture to be, once again, appropriate. Yet, barring the prohibitively costly razing and rebuilding of many existing homes, or an unthinkable change in our national energy posture, modification may be our best strategy.

For the vehicle of this thesis, I chose an existing building (built in the 1960s) on Gladewood Drive, within a subdivision in Blacksburg, Virginia. This building served for a time as the Unitarian Universalist meeting house. The meeting house was sold and converted into a private residence after the Unitarians constructed a new meeting house nearby.

The front of the building is oriented to within a few degrees of due north with the main entrance being through a door in the center of the façade. Internally, the building offers the interior no transition space to protect it from cold winter breezes or hot summer air once the door is opened. The rear, oriented due south, makes it a good candidate to take advantage of the sun’s primary components of heat and natural light. In order to have the existing building maintain consistency with its surrounding neighbors, and to keep costs down, I chose to retain the same basic veneer — brick — and to keep disturbances of the aesthetics of its front and sides to a minimum.

The house is essentially a split level ranch style building. The existing interior layout is fragmented and lacks organization (see pages 15-16). This layout included space for a ‘sanctuary’, four classrooms, an office, two kitchens, one and one half baths, and a utility room. The former sanctuary was the largest room in the structure, taking up almost one half of the main floor space. Because of its prominence within the existing plan, and its potential for redesign and reutilization, it is in the former sanctuary area of the house that I chose to concentrate the family meeting areas. It is from this focal point that the thesis emanates.

In addition to the existing structure, the other great constants are the seasonal positioning of the sun and the potential exterior views. I have used the building’s structure, and the predictable seasonal patterns of light and shadow cast by the sun, to generate forms both physical and visual within the ‘new’ structure. In conjunction with these, I have been able to open up enhanced views, from the interior, of the surrounding site. In the rear I chose to add a passive heat collecting solarium, the inside of which contains a complex arrangement of heat retaining concrete blocks and poured concrete forms. These comprise a heat retaining mass wall which acts as the connector and mediator between the old and the new. This wall originates in a pool of water / hot tub at the east, inside the southern addition. It serves different functions as it reaches to its full height and mass at the location of the old sanctuary, the new center of family meeting. The wall then penetrates the addition’s west end. Here a tower makes a last gesture towards the sky before beginning its descent towards the earth. From there, it wraps around a two level platform / ‘plaza’. From the ‘plaza’, it roots itself in the soil midway towards the front of the building.

The architectural expectations of this wall are that it will offer places, private and public, to congregate; expansive locales for the display of solid, non-infrared- or ultraviolet-vulnerable, objects d’art at the exterior, while still retaining the ability to place paintings and prints on the existing interior. While not necessary to the design, it offers — to the barbecue enthusiast — a place to cook within the tower. In addition, the wall will store and temper heat, will ventilate air as well as excessive heat build up, and provide places for birds to rest or nest.

Moreover, the wall creates shadows on itself, in the addition, and inside the house. The wall controls the way in which light enters the house, as well as the appearance of the new interior facade inside, and how one may view the outside from within the house. Ultimately, with the rising, passage, and setting of the sun, the wall creates an interior environment of transient light and shadow which inherently ensures an ever changing, non-boring, environment.

At four separate locations scuppers protrude from the south addition’s roof in order to drain off water from rain and snow melt. Inside of the addition a conscious effort has put four corresponding viewing areas from whence, and weather permitting, a person can sit and watch the water gracefully fall to splash into catch basins on the ground. These four locations were all determined from original openings in the existing structure. At each spot the wall allows one or more of various types of seating.

The first location, the water pool / hot tub, permits several people to relax together while simulta-
neously soaking away the day’s cares. Here, the window overlooking the catch basin dips down low enough for comfortable viewing of the falling water from inside the tub. A recessed bench alongside the pool / tub permits the same view without the need for immersion.

A seat built directly against the vertical wall is the second location. Besides its having a variant on the common type of view, it permits the sense of security innate in a ‘covered’ back. This is enhanced by the emanation of the wall’s retained warmth.

The third seating location is a concrete bench, standing independent of the wall, and rising, unsupported from the floor.

A concrete landing which juts from the newly re-structured living room is the fourth, final, most open, and grandest seating location. Here a wooden staircase is attached which allows a person to enjoy the descent into the entire addition while still being able to view and sense the strike of water into the catch basin when it is raining.

Formerly, the entrance of the old meeting house was most reminiscent of a cave. This has been replaced by an open stair well. A new entry way from the east through the new sun-porch / vestibule allows the winter warmth in the house to remain inside. The new vestibule also serves as a screened-in porch away from most of the summer’s direct sun, as it is located on the north face of the house. As light and shadow move gracefully through the rooms and the addition, the resident is given an environment both peaceful and subtly tumultuous; an ideal situation for creative meditation.

“the beauty of what you create comes from if you honor the material for what it really is.”

Louis I Khan
Light's Journey

Travelling through space
the fastest speed known
I am cast out aimlessly
no destination
homeless
without recollection of beginning
no resolution towards an end
I travel

One moment
I encountered an object
dark and without form
until...
until, that is, I touched it
while most of my essence passed,
the part of me which remained
brought the shapeless thing to life
it glowed...
had texture...
feeling...
it was, from that instant,
alive
then I was gone
without a part of me
yet, I lost nothing
instead I gained a warmth,
a knowledge that for that instant,
I too, was alive

Time is meaningless to me...
I travel alone
seeking out destinations,
I know not where,
or why
yet, I sense there is more.

I am appreciated here,
my strength is revealed.
everything I touch is illuminated,
brought to life!

Sometimes I am in balance here,
my light is countered by darkness.
I find my presence not only floods surfaces
but, filters through cracks as well.
it is through these cracks
these openings
that I discover time...
my fingers move methodically
across each surface
I am allowed to touch,
all due to the simple fact
that this particular object rotates.

Time, it turns out, is relative
it is my passing essence which creates time...
this, and my opposition:
shadow
are what mankind idolizes.
I feel this appreciation
with every gentle caress I make,
with every structure they create
which takes account my touch.

They call me Light
and in praise of me
they build
It is here that I found
my purpose,
my destination,
my home.

David Paul Bingham
Location
This thesis required a vehicle. This vehicle — a building suitable or modifiable — itself required a number of attributes, among these were energy inefficiency, poor qualities of light and shadow distribution, limited to very limited aesthetic appeal, and a floor plan of little or no merit as a residential floor plan. Such a building exists on Gladewood Drive within a subdivision of Blacksburg, Virginia.

This building had, for much of its existence, served as a meeting house for the Unitarian Universalist Church. After the Unitarians constructed a new meeting house nearby, the building was sold and converted into a private residence. Modifications done just prior to and after the sale were minimal. It retained all the quaint charm of a meeting house.

The exterior of the building is a regular rectangle with a monotonous brick veneer. The monotony is relieved by a number of plain and ordinary windows and two outcroppings, one more or less useful, the other largely ornamental.

At the front, the monotony of the veneer is broken by a columned portico. Unfortunately, as the orientation of the front of the building is nearly due north, and the main entrance — coming from the
portico — is unsheltered, the opening of that door lays the entire interior of the structure open to the icy blasts of winter and the uncontrolled escape of cool conditioned air in summer.

The rear is oriented almost due south. This makes it a good candidate for a modification that could take full advantage of the sun’s primary components of heat and natural light. Moreover, the need to maintain consistency with the building’s surrounding neighbors, suggests creating the minimum possible disturbance of the aesthetics of its front and sides.
A Dialogue Between Existing and New Parts
A Critique of the Existing Structure

The interior of the house can be described as essentially a split level ranch design. The existing interior layout is unorganized and rather ‘choppy’, suboptimal for the social needs of a family in residence. Its main floor dominates the interior, which is in turn dominated by the former ‘sanctuary’. The very factors that have made the building suitable as a church severely hamper its functioning as a family residence.

Upon entering the house through the front door, by way of the portico, one finds oneself in a shallow and narrow entranceway. A staircase lies straight ahead. This staircase is split with one section, on the left, ascending to the main floor and one on the right descending to the ground / subterranean lower level. The right staircase goes down between two darkly paneled walls, ending in a similarly paneled hall perpendicular to the stairs. The staircase going up to the main floor, though not closed in, offers little relief from the claustrophobic and unwelcoming entranceway.

The main living space on the second floor begins at the top of the right staircase. It is extremely disorganized, being cut up in such a way as to divide itself into three distinct zones. Facing directly to the left from the top of the stairs, one encounters the first zone, a narthex with a fairly open area for registration and coat hanging. Adjoining the narthex are two classrooms and a bathroom. Straight ahead of the stairs, facing south towards the rear of the building, is the kitchen which makes up the second zone. Facing to the right is the third zone where the largest area in the building is used as the sanctuary. The sanctuary of the meetinghouse is the largest room in the structure, encompassing almost one half of the main floor space. Here in the sanctuary one sees that the building has been added to. The sanctuary room was doubled in size with this addition.

For residential purposes, the narthex is wasted space. Both main floor bedrooms are cramped and confining, though this is somewhat mitigated by each of them possessing two windows. The kitchen, as it exists, is likewise cramped, providing no space for any but the cook of the hour, nor any space for more than the merest cooking. Completely out of the question is the prospect of entertaining while preparing the daily repast. While plainly destined to be some form of living room, the sanctuary as is, is simply too large — in human terms — for comfort. The addition has exacerbated this condition.
Descending to the first level, one encounters a cell-block of rooms that were once used as offices and classrooms. Here too we find a small kitchen as well as a half bath and laundry. Over half of this floor is underground, limiting window depth, in addition all of the rooms on this level are covered with dark wood paneling, making it a very dark, even foreboding, place to visit. Extensive renovation is necessary to make this house more than minimally inhabitable. The current heating system is electric radiant baseboard.

The second kitchen is unneeded in a single-family residence; wasted space. Access to the laundry room is only through this unnecessary kitchen. This limited access also limits the uses to which the kitchen space may be put, barring modification. As a sleeping area, the lower level lacks storage space.

The building’s structure is conventional lightwood with batt insulation and a brick veneer facade. The current windows are wood frame with single glazing, further covered by storm windows. The addition has newer wood framed windows with double-glazing.
A Dialogue Between Existing and New Parts

The addition attempts to enhance the original structure, in that it complements the whole. A conscious decision was made to not alter three of the buildings facades. Therefore, the rear of the structure, offering the highest potential for energy conservation, became the focus of this thesis. Several changes are also proposed in the original building. Among them a glass vestibule was added to the front of the building, to curtail sudden temperature swings. Both the front and rear addition rooftops project directly from the existing roof line.

The existing southern openings were the determining factor in where the main house would open itself to the addition. These openings were either enlarged, joined, kept the same, partially covered or sealed. However, no additional openings were created.
Plans
Existing Conditions

Ground Floor - Existing Plan

Ground Floor - Revised Plan

Main Floor - Existing Plan

Main Floor - Revised Plan

Proposed Changes
Existing Conditions

Ground Floor

This whole floor area was used as a day care facility throughout the week.
1. Classrooms were located at both ends of the building.
2. The classroom on the western end of the building is an addition to the original structure.
3. The stairwell is confining and enclosed. The stair exits into a narrow hallway opposite a small bathroom door.
4. There is very little light inside the south facing room adjacent to the west classroom. This is a result of the existing rear deck, which is level with the main floor.

Note: Existing hatched walls will be removed for the purpose of this thesis.
Existing Conditions

Main Floor

1. The main floor area is noticeably unorganized and ‘choppy’. The eastern half contains classrooms and a kitchen.
2. The entire western half of the building has been used as the sanctuary for the church. The farthest western end is the upper floor of a two-story addition.
3. The two east corner rooms were being used as classrooms.
4. The two compartment bathroom.
5. The existing kitchen has two entrances. The main entry is located opposite the top of the staircase, with the second opening directly into the sanctuary.
6. A deck is attached at this level on the western half of the southern face.

Note: Existing hatched walls will be removed for the purpose of this thesis.
Proposed changes

Ground Floor

1. Existing stairwell: turned the down staircase, coming off the main entry ninety degrees, cut away second floor above this enlarged stairwell.
2. Removed the tunnel-like hallway by removing a tiny office space between the landing and the original west end wall.
3. Enlarged bathroom and added a laundry room.
4. Divided large classroom into a bedroom, walk in closet and small office space.
5. Added a solar addition beginning at the base of the existing rear window openings.
6. Inside the addition, a wooden staircase runs from the addition floor to the living room on the main floor.
7. Made a pool / hot tub at the lowest point of the heat retaining mass wall.
Proposed changes

Main Floor

1. Added a glazed-in sun porch / vestibule to replace the existing front porch.
2. Enlarged the existing stairwell: Cut away second floor to expose the first, and removed the ceiling above this enlarged stairwell to expose truss work under the main roof.
3. Divided largest room, the former Sanctuary, into a Living room, Dinning room and Kitchen, by removing the interior partition walls and creating an open kitchen using mainly cabinetry to define the space.
4. Replaced the two east end rooms with a master bedroom suite, containing a bathroom and walk-in closet.
5. Added an 11’6” wide solar addition parallel to the southern exterior building facade.
6. Basins to collect water runoff from the south slope of the roof via the scuppers located between the skylights above.
7. Basin runoff flows through a channel to a cascading waterfall.
8. Two level patio along west side of the addition.
1. The main roof is extended outwards over the new vestibule and southern addition.
2. The heat retaining mass is allowed to protrude through the roof to allow for ventilation.
3. Vent stacks are added as necessary to provide additional ventilation.
4. A vertical element was added out the west end of the building. This houses a built-in grill three feet above the upper plaza deck.
“The character of a man-made place is to a high extent determined by its degree of “openness”. The solidity or transparency of the boundaries make the space appear isolated or as part of a more comprehensive totality. We here return to the inside-outside relationship which constitutes the very essence of architecture.”

*Christian Norberg-Schultz*
The heat retaining mass and wall does triple duty. Not only does it store and ration heat energy in winter, but it serves also as heat absorption mechanism / climate moderator in summer. Moreover, the openings in the wall serve to limit and control the amount of light admitted into the main house. Lastly, it restricts, but more importantly guides and focuses, the views of the exterior obtainable from the interior of the house.

The wall is constructed of solid concrete blocks, held together by mortar. The blocks are, for the most part, flush. However, numerous among them project inward and outward in organized groups forming discrete walls within the wall. This serves both to affect the energy properties of the wall and to break up what might otherwise be a mere façade, lifeless and dull. These projections and recesses modulate the light, creating patterns of light and shadow that vary continuously with the movement of the sun through seasons and days. Adjustable dampers serve to control and moderate energy flow and conservation. Energy flow is further moderated — stretched in time — by the propensity of the differing thicknesses of the wall to give off or absorb heat at different times and rates of exchange.

By its combination of openings and solid barriers, the wall unites two disparate structures to make a unified whole.
Elevations of interior wall looking south through the addition’s heat retaining wall. Former openings are shown with a dashed line. The existing wall openings propose the location of most of the openings in the new addition wall.

The wall acts as the mediator between the old and the new, deciding how much southern light the interior receives, as well as how much of the existing structure is revealed in the addition.
Axonometrics
1. Axonometrics from the Front
The front of the building facing north has a glazed-and screened-in sun porch. This porch acts as a vestibule in the winter to help block sudden temperature swings, while in the summer it serves as a place to hideaway from the majority of the summer day’s sun.
The mass wall acts as the mediator between the old and the new. It controls the southern light reaching the interior and reveals portions of the existing structure.
2. Axonometrics from the Rear
The south addition in the rear of the house is made of several components from wood framing and paneling, poured and concrete block forms, and double paned glass windows. The roof top skylights have retractable venetian blinds underneath to help lessen the solar intake during warmer months. All four of the tall vertical windows have retractable blinds between the two layers of glass for the same reason. To control the sun on the rear wall of the addition shades are installed inside the remaining vertical windows.
Here the relationship of the mass wall to the existing openings on the ground floor is evident. It is on the main floor that the relationship between the mass wall and the house takes on a greater complexity. The rear of the wall is exposed to the interior at several locations based on the original rear wall openings. In this way sunlight is replaced by shadow on the building's interior, a double gesture of the wall's presence. In this way, the mass wall acts as the mediator between the old and the new. The new mass wall also remains separate from the main building by standing several inches away from the exterior brick face. The only time the wall visually touches the existing structure is at the landing; the entrance between the old and the new.
The Heat Retaining Mass
Water
Water, after striking the surface of a man made material must be directed in its course. If it is allowed to run haphazardly without first being controlled, the architect risks erosion to soil and damage to building. Moreover, the potential aesthetics of the falling or running water are lost to random nature. In Japanese architecture, by way of contrast, rain is often guided from the roof at several defined points each of which has a vertical chain for the water to cling to as it descends to the ground. At the end of each chain a rock is placed to diffuse and disperse the water, thus preventing soil erosion (See bot. pg. 31). It is the responsibility of the architect to take charge of this, to set the course along which the water should travel. When the water is set into a focused path and allowed to fall freely from a given height there should be a receptacle to receive it as it journeys to the earth. This may, perhaps, be a basin. Alternatively, a pool of water, serving as the splashing terminus, can make a simple drain spout into a miniature river, exiting a mountaintop, turning it into a free-flowing waterfall which meets its finger-carved lake at the bottom.

(See bot. pg. 31)
Water from the main roof is guided away from the wall and glass enclosure as it cascades downward. Thereafter it is caught by a recessed slot cut into the roof an inch behind the wall. In this way, most of the water is channeled around the wall and through the wall. Where the wall does not shield the skylights other recessed slots catch it for diversion to the scuppers. The skylights, therefore, need deal only with such drops of rain as may patter upon them directly. Even then, however, a gutter running the length of the addition catches any water remaining, diverting it to the scuppers for control and use.

View from South

From each scupper’s spout volumes of caught water descend earthward during rainy days. These four artificial waterfalls travel slightly under six feet before striking the catch basins. The actual distance to be traveled is infinitely variable with the volume, and hence velocity, of the falling water. From the catch basins the water faces one minor fall and a slightly more profound ripple before running into the channel which leads to the main waterfall at the southwest corner of the house. This waterfall contains a three-tiered drop of its own, leading to a pool which itself contains two additional tiers. The water then flows into a deeply recessed drainage well / storm drain.
All of the drain close-ups on the following pages are taken from the same northeast-viewing angle from the front of the building.

View from North

1. Roof Drains
Here we see a detailed close up of the system by which water is prevented from flowing across the skylights. From the center one of the three vent stacks the reader is asked to turn his or her eye slightly up and slightly to the left, note the square holes in the scuppers through which rainwater which has been caught by the recessed slots flows. This is repeated near the scupper’s end where more square holes permit the collection in the scupper of more water caught by the long gutter.
Here we see a slightly different arrangement than in the preceding page. As in that arrangement, the left most skylight is shielded from flowing water by a recessed slot which drains into the scupper. On the right, however, a much longer slot protects the wall, directing water into, but not through, the scupper.
The third and final segment of the water control system is shown here. In this drawing Condition A is similar to that used in the preceding page (p36). What distinguishes this section, however, is Condition B. At this location, only, water collected by the recessed slot before the wall actually flows though the wall into the scupper. Other rainfall control measures are the same as in the preceding two pages.
For purposes of contrast, this section shows all three of the roof’s water control systems side by side. Note that each scupper is flanked by a pair of double bayed skylights.

The section to the lower left shows one of the locations where this occurs. Note positioning of the recessed slots above the skylight but below the heat retaining wall, as well as the placement of the gutter relative to the scupper’s spout.
At this location, seen as Condition B two pages prior, the wall mass reaches its highest point. It is here that there is an opening to allow water from the south slope of the main roof, caught just behind the wall, to flow through the wall and pour through the scupper.

The view inset below represents what a person inside the addition would see were they at the foot of the stairs looking out the window towards the south. Here they would be afforded the view of the scupper, drainage basin and channel, as well as of the foliage in the distance. Thus, the viewer would be treated, during rainfall or snowmelt, to a complete image of water falling, splashing, and flowing. Were the viewer to take two steps forward, he or she could add the view of the three-tiered waterfall and pool.
The Catch Basin Waterfall
Ventilation
3. The Ventilation System

The ventilation of the addition is achieved through hidden dampers in the heat retaining mass wall (see page 48, juncture of the heat retaining mass wall and roof). These openings occur in the portions of the mass which penetrates the roof. There are also three dampened metal vent stacks in the roof of the addition. Air is drawn in through operable windows in the addition and in the main house. The air circulation via natural convection can be aided, if necessary, through ceiling fans and exhaust fans located on both the east and west ends of the addition and attic. Conversely, heat gain and loss through the main house’s non-glazed openings, can be hampered by sliding closed insulated curtain doors, located between the heat retaining mass and the existing rear exterior walls.

Horizontal blinds located between the double paned glass skylights limit overheating. The floor of the addition is also designed as a heat retaining mass to moderate temperature swings. The great amount of mass within the addition’s solid concrete block wall aids the same purpose.
All of the vent close-ups on the following pages are taken from the same northeast-viewing angle from the front of the building.
At the southeast end of the addition, ventilation is aided and excess heat buildup reduced through the agency of three metal vent stacks. These are dampened at the bottom of each duct, inside the rear addition.
At the center of the addition, four smaller heat vents — themselves integral parts of the mass wall — supplemented ventilation and relieve excess heat buildup. These four metal vent stacks are seated atop channeled openings in the wall. These openings are also dampened at the bottom of each duct shaft inside the mass wall. 

On the following page we see the ten vent openings made inside the wall at its southwest end. These openings are internally dampened in a manner similar to all the others, though they penetrate through the faces rather than the top of the wall.
Cross-section Through Tallest Metal Vent on the Wall.
Cross-section Through the Addition Showing Construction Detail of Ventilation System.

This cross-section is taken through the south addition at the point of the tallest metal vent on the wall (See exterior axonometric on previous page).
Interiors
View Inside Living Room Towards Kitchen and Main Stairwell.

View Inside Living Room Towards Solarium Staircase.
View from the Raised Concrete Platform at the End of the Stair of the South Hedge Behind the Addition.

View from the Top of Staircase into the Addition.

View Inside South Addition Towards the West.
View of Inside the Addition Facing East.

Between the idea
And the reality
Between the motion
And the Act
Falls the Shadow

T.S.Eliot
Master Bedroom Looking Towards Addition Hot Tub

View Inside Master Bathroom
SOLARIUM and WALL
(12pm, June 21st)
View Inside Addition towards North-East
Rendering of Sun-Lit Interior Only.
View Inside Addition Towards South-East
Rendering of Sun-Lit Interior Only.
View of Main Floor without Interior Walls
Looking from Addition Towards Main Stairwell.
View of Interior without Walls Shown, from the East End Looking West
Rendering of Interior.
Some there be that shadows kiss;
Such have but a shadow’s bliss.

*William Shakespeare*
“I turn to Light, the giver of all presences. By will. By law. You can say that light, the giver of all presences, the maker of a material, and the material was made to cast a shadow, and a shadow belongs to the light.”

*Louis I. Kahn*
This thesis was begun on the three premises that the average residential house in the United States was aesthetically dull, poorly planned from a livability point of view, and wasteful of energy. The challenge was to take a typical example of one of these residences, reorder and add to its interior to enhance livability, improve and ‘naturalize’ its energy needs, and control such rainfall and snow melt as occurred to improve its aesthetics.

The primary means of effecting these changes was the creation of an addition. This addition increased living space, created areas both private (for meditation) and public (for social interaction), and contained within and without it the means of controlling light, creating shadow, channeling of water flow, and moderation of temperature.

Sunlight and shadow may be calculated and, allowing for such variables as clouds and time of day, even predicted. Energy flux may be controlled. However, the experience of infinitely variable patterns of sunlight and shadow, of chaotic waterfalls, of privacy and openness, of the human mood, of novelty and boredom… none of these admit of any real precision. Notwithstanding this, all are part of the human condition.

With this work I have gone beyond mere calculation, entering the realm of subjective experience. Rather than adding a simple sunroom to supplement the existing, and inadequate, electric baseboard heating system, this project takes the concept of an addition far beyond the level of a mere solar addition. The addition, as conceived and planned, allows the view of the outside and variegation of the sun light striking the heat retaining mass wall to be a phenomenon of the senses. This is a result of my response to the sun, finding more importance in the sun’s light than its warmth, more in the seeing than in the feeling.

The centerpiece of these changes has been the heat retaining mass wall. Yet the wall does far more than act as a heat sink. With its variations of texture and density, its effect of moderating and changing patterns of sun and shadow, its subtle divisions of the added space into areas whose dimensions and characters allow the resident to seek and find the right place and time, to gain the right external input, to suit a given mood.
List of Illustrations

All other photographs, drawings and poetry by the author.

2. Patricia Parola, Japanese Garden near Portland, Oregon.
7. Qi Zhu, Rendering in Lightscape from a 3D-StudIo Viz model by author.
8. Qi Zhu, Rendering in Lightscape from a 3D-StudIo Viz model by author.
9. Qi Zhu, Rendering in Lightscape from a 3D-StudIo Viz model by author.
10. Qi Zhu, Rendering in Lightscape from a 3D-StudIo Viz model by author.
Notes

Bibliography


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EDUCATION:

Master of Architecture, Architecture, May, 1999
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Bachelor of Science, Industrial Technology: Concentration: Computer Science, May, 1985
State University of New York at Binghamton (presently, Binghamton University), Watson School of Engineering, Binghamton, NY

Associate in Specialized Technology, Architectural Drafting and Design, May, 1980
Johnson School of Technology (presently, Johnson Technical Institute), Scranton, PA

ACTIVITIES/HONORS:

- Participated with Virginia Tech Americans with Disabilities Act (ADA) Project Review Committee; evaluating, developing, and recommending changes to plans of new campus buildings to insure code compliance, 1997 - 1999
- Acted with Virginia Tech Evacuation and Safety Task Force; planning and coordinating emergency evacuation for all persons having disabilities located on campus, 1996-1997
- Co-Chair of the Americans with Disabilities Act (ADA) Accessibility Advisory Panel at Virginia Tech, 1999
- Guest lectured Interior and Barrier Free Design classes at Virginia Tech and Radford University, Radford VA, 1993 - 1999
- Associate Editor of Johnson School of Technology newspaper, TECH TIMES, 1977 - 1980
- Member of Tau Sigma Delta, National Architecture Honor Society
- Graduated with Honors, Watson School of Engineering, State University of New York
the breeze

rising early
     in the morning

the sun
     hidden behind the misty clouds
     casts it’s light
         in a mystical luminous manner
         over the land
         gently stirring up the breeze

the light
     comes through my open window
     carrying with it
         the gentle wind
         which caresses
         my awakening face and arms

i am moved...
     memories stir...
     i am transported through time.
suddenly i am in the woods
     alone in my tent

the coolness of the morning air
     pierces the nylon walls that surround
     and protect me

happiness envelopes me
     God is here

the basic essentials
     of life
         touch us
         and we almost ignore them
     they pass unnoticed.

it is when we feel them
     that we become one with the universe.

the light
     which creates time
     warms the planet
     which gives us the breeze
     we cherish

i am awake here
     it is a good beginning
     to a good day.

“the architect... is the one who conveys the beauty of spaces, which is the very meaning of architecture. Think of meaningful space and you invented environment, and it can be your invention. Therein lies the architect.” 9

Louis I. Kahn