A Chapel in Back Bay: 
Heaviness and Lightness

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OF TECHNOLOGY

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To my parents, with love

Deepest
Thanks to: Renee Chow
Jim Axley
Shun Kanda

for their guidance, support, and encouragement

To: my brothers Sarakom and Saravut

for always being there for me

And to: all my friends
for their caring and support
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ABSTRACT

This thesis chronicles a design process of a chapel in Back Bay, Boston. The first three sections record a juxtaposition of short studies and concept designs while the last focuses on the design development of the chapel alone.

Heaviness and lightness are the inspiration for this thesis. I have come to understand the words less in terms of their conventional meanings and more of a dialogue between ranges of architectural forms which complement one another. An experience of a place can be enhanced by thoughtful interplay of these two qualities.

Through the specific site and story can these qualities be deployed in a meaningful manner.

Thesis Supervisor: Renee Chow

Title: Assistant Professor of 
Architecture
1 Preliminary Studies
Cultivate the heart and quite the intellect, 
Thus the Way may be obtained. 
The Way cannot be expressed by the mouth, 
Seen by the eye nor heard by the ear. 
It is the means to cultivate the heart so as to rectify forms.¹

Kuan Tzu (645 B.C.)
Inspiration:
Visual References

The fragile wooden posts and delicate ornamental details of vernacular architecture have always astonished me. Boston architecture is of equal interest for quite different reasons: its impressive bulk and weight. Richardson's massive stone arches and 348 Beacon Street's robust terra-cotta ornaments can be just as exciting in another way. I chose to explore these two worlds. I wish to articulate the qualities of these complementary forms to enhance an experience of architecture.

The following six pages contain series of images arranged into a pattern which describes visually my initial impression of the two qualities.
I will devote my first lecture to the opposition between lightness and weight, and will uphold the values of lightness. This does not mean that I consider the virtues of weight any less compelling, but simply that I have more to say about lightness.

After forty years of writing fiction, after exploring various roads and making diverse experiments, the time has come for me to look for an overall definition of my work. I would suggest this: my working method has more often than not involved the subtraction of weight. I have tried to remove weight, sometimes from people, sometimes from heavenly bodies, sometimes from cities; above all I have tried to remove weight from the structure of stories and from language.

In this talk I shall try to explain - both to myself and to you - why I have come to consider lightness a

1 House along a river in Thailand
2 Scarpa's pavilion
3 Wooden shutter of a house in Thailand
4 Pavilion in Ayudhaya, Thailand
value rather than a defect; to indicate the works of the past in which I recognize my ideal of lightness; and to show where I situate this value in the present and how I project it into the future...

...The only hero able to cut off Medusa's head is Perseus, who flies with winged sandals; Perseus, who does not turn his gaze upon the face of the Gorgon but only upon her image reflected in his bronze shield. Thus Perseus comes to my aid even at this moment, just as I too am about to be caught in a vise of stone - which happens every time I try to speak about my own past. Better to let my talk be composed of images from mythology.

To cut off Medusa's head without being turned to stone, Perseus supports himself on the very lightest of things, the winds and the clouds, and fixes his gaze upon what can be revealed only by indirect vision, an image caught in a mirror...

...The relationship between Perseus and the Gorgon is a complex one and does not end with the beheading of

1 H.H. Richardson, Hayden Building, Boston
2 L. Sullivan, The Auditorium Building, Chicago
3 F. Furness, Pennsylvania Railroad Station
4 Scarpa, wall texture of Castelvecchio Museum
the monster. Medusa's blood gives birth to a winged horse, Pegasus - the heaviness of stone is transformed onto its opposite...

...Whenever humanity seems condemned to heaviness, I think I should fly like Perseus into a different space. I don't mean escaping into dreams or into the irrational. I mean that I have to change my approach, look at the world from a different perspective, with a different logic and with fresh methods of cognition and verification. The images of lightness that I seek should not fade away like dreams dissolved by the realities of present and future...

...From what I have said so far, I think the concept of lightness is beginning to take shape. Above all I hope to have shown that there is such a thing as a lightness of thoughtfulness, just as we all know that there is a lightness of frivolity. In fact, thoughtful lightness can make frivolity seem dull and heavy.

1 Horizontal trap for snake-head fish from the central region of Thailand
2 Scarpa, roof detail from Castelvecchio Museum
3 Furness, interior of a bank in Philadelphia
4 Scarpa, bridge detail from Castelvecchio Museum
I could not illustrate this notion better than by using a story from the *Decameron* (VI.9), in which the Florentine poet Guido Cavalcanti appears...

...Were I to choose an auspicious image for the new millennium, I would choose that one: the sudden agile leap of the poet philosopher who raises himself above the weight of the world, showing that with all his gravity he has the secret of lightness, and that what many consider to be the vitality of the times - noisy, aggressive, revving and roaring...

...In short, in every case we are concerned with something marked by three characteristics; (1) it is to the highest degree light; (2) it is in motion; (3) it is a vector of information...

...We might say that throughout the centuries two opposite tendencies have competed in literature: one tries to make language into a weightless element that hovers above things like

1 F.L. Wright, interior of the Imperial Hotel, Japan
2 F.L. Wright, a house
3 F.L. Wright, the City National Bank and Hotel, Iowa
4 F.L. Wright, wall detail, Imperial Hotel
a cloud or better, perhaps, the finest dust or, better still, a field of magnetic impulses. The other tries to give language the weight, density, and concreteness of things, bodies, and sensation...

I have spoken of the shaman and the folktale hero, of privation that is transformed into lightness and makes possible a flight into a realm where every need is magically fulfilled. I have spoken of witches flying on humble household implements, such as a bucket. But the hero of Kafka's story doesn't seem to be endowed with the powers of shamanism or witchcraft; nor does the country beyond the Ice Mountains seem to be one in which the empty bucket will find anything to fill it. In fact, the fuller it is, the less it will be able to fly. Thus, astride our bucket, we shall face the new millennium, without hoping to find anything more in it than what we ourselves are able to bring to it. Lightness, for example, whose virtues I have tried to illustrate here.

1 Fishing traps and equipments from Thailand
2 Decorative detail of a roof, Thailand
3 F. Furness, detail of roof truss, University of Pennsylvania Library, Philadelphia
4 Siren, detail of roof truss of a chapel in Finland
"Semper was to divide built form into two separate material procedures: into the tectonics of the frame in which members of varying lengths are conjoined to encompass a spatial field and the stereotomics of compressive mass that while it may embody space, is constructed through the piling up of identical units... These are gravitational opposites, the immateriality of the frame and the materiality of the mass...

It is arguable that the practice of architecture is impoverished to the extent that we fail to recognise these transcultural values and the way in which they are intrinsically latent in all structural form.

...As we have already indicated, the tectonic lies suspended between a series of opposites.... Dialogical conditions are involved in the articulation of tectonic form, particularly the contrast between the culture of the heavy - stereotomics, and the culture of the light - tectonics. The first implies load-bearing masonry and tends towards the earth and opacity. The second implies the dematerialised a-frame and tends towards the sky and translucence..."  

Kenneth Frampton. Rappel a l'ordre.

1, 2, and 3 My old projects
Heaviness and Lightness:
a diagrammatic study

These visual references have been arranged into eight related series and abstracted the qualities immediately felt in each into relief diagrams of plain cardboard and tiny plastic beads. Together the series create a matrix of how heavy and light forms might be juxtaposed with one another.

However, this matrix is far from being complete. It only suggests a way of organizing my perception as well as communicating my idea to the others. The generalization of cardboard surfaces as heavy and rows of clear plastic beads as light with some yellow beads as in-betweens is a crude representation, for the range from heavy to light can be much more delicately depicted. Nevertheless, these abstract diagrams begin to describe something beyond the visual qualities of the images.

I rarely think in words at all
--Einstein

1 Children under straw pavilion
2 Sleeping worker, St. Thomas Cathedral, Bombay
3 Buildings on piers in Britain
4 Buildings on piers in Britain
5 A building by F.L. Wright
6 Painting of an unknown building
Solid panels stop light while screens offer continuous light. They are layered side by side.

1. Exterior of a shrine in India
2. Interior of the same building

Layering of a more permeable surface to a more opaque one from outside towards inside.

3. Chiniy Kiosk, Istanbul
4. Interior promenade of a building in India

Stone arch spans the structure across while resists load under compression.

5. F. Furness, Pennsylvania Railroad Station

Steel truss span the roof across as well as allows light to enter the building from above.

6. Berlager, Stock Exchange, Amsterdam

Heaviness as bearing and lightness as spanning. They are independent of their materials.

7. Cathedral at Burgos, France
8. F.L. Wright, Falling Water, Pennsylvania
"...How carefully is the elusive hidden that we often have to imagine what lies behind screened doors..." 

"...It is a strong wall, flat but for regular punctures. A stone wall in the cradle of God's finger, into which one's spirit may find the presence of sanctuary and rest." 

Kevin Low
2 Program and Site
The Site

The site is located at the intersection of Marlborough and Berkeley streets. It is in the Back Bay area where buildings of various uses display a degree of environmental homogeneity. The regularity of the fabric pattern allows for some alien architectural vocabulary to be actively introduced and vitally engaged.

View of the First Lutheran church opposite to site on Berkeley Street.
The Program

The chapel will encourage a sense of community and religious awareness which corresponds to different levels of engagement ranging from secular public gathering to private individual contemplation. Space for secular activity is provided on the ground level where it is hoped that much of the casual interaction will take place. The main gathering room, located on the upper level, accommodates different religious activities such as private worship, choir group meetings, and wedding ceremonies. A small courtyard, protected from the outer world by walls of varying thicknesses, separates the chapel from the offices and the reading room. The permeability of the chapel’s ground level suggests a flow of activity into the courtyard area, while the upper level is very much enclosed by solid walls which only open up to the sky.

1 View along Marlborough Street, opposite to site
2 View along Marlborough Street, on the same side as site
"...And yet architecture is not reducible to materials, making, building, environment, needs, and social enterprises...We do not see architecture as a system of precedents, but rather as systems of forms, received and invented, that must be understood in the complex relations of their making and use..."

Standford Anderson (1992)
3 Concepts
Concept Design I

1. Study on Marlborough Street edge condition.
   Original: casted plaster at 1/2" scale
2 Sketch model
   Original: cardboard and clay at 1/32" scale
3 Sketch model
   Original: bass wood and chip board at 1/32"
4 Sketch model
   Original: metal screens and pins at 1/32"
   (page 30 and 31)
5 3/32" site plan
6 Blown up detail of site plan
Furness and Scarpa:
Case studies on details of Pennsylvania Academy of Fine Arts and Brion Pavilion.

In the work of Carlo Scarpa
"Beauty" the first sense
Art
the first word
Then Wonder
Then the inner realization of
"Form"
the sense of the wholeness of inseparable elements.
Design consults Nature
to give presence to the elements.

A work of art makes manifest the wholeness of "Form"
the symphony of the selected shapes of the elements.

In the elements
the joint inspires ornament, its celebration.
The detail is the adoration of Nature.⁷

"...this is not decorative excess for its own sake. Each detail is used to enhance, accent, and differentiate, to create spatial flow and unity. These are tools manipulated with full awareness..."⁸

Ada Louise Huxtable
(Note of Furness)

Louis I. Kahn
(What Will Be Has Always Been)
The shift in the support axis is contradictory to the nature of the structure. However, both architects have made the decision as a trade-off for the territory gained by such action. In Scarpa's Brion Pavilion, the territory between the roof and the floor is divided into two portions, the larger defined by the longer member which belongs to the roof while the smaller is defined by the shorter member which belongs to the floor below. Similarly, in the Academy of Fine Arts, the territory underneath the smaller arch receives the landing of the stair while the one underneath the larger suggests the spatial flow of the room beyond.

1 Furness and Hewitt, Column detail, Pennsylvania Academy of Fine Arts, Philadelphia, 1871.
2 Carlo Scarpa, Column detail, Brion Pavilion, Treviso, 1969.
Corners

This is a diagrammatic note on the interplay of solid, continuous surfaces and discrete, screen-like elements at the intersection of Berkeley and Marlborough Streets. The diagrams start from a typical continuous L-shape corner which gradually transforms into more discrete pieces of walls and columns.

Three 1/4" models of the same corner have been made to study three-dimensionally different ways in which materials are put together to create similar corner forms.

Without really having a clear picture of the overall organization of the plan, I have chosen to start with the design of this particular corner of the building. The later development of the plan has grown from this corner study/design.

Thus, this exercise touches on the issue of heaviness and lightness as well as offers the possibility of further design exploration.
Courtyards

The form of a courtyard is interesting because it articulates an interplay of permeable surfaces of the inner core and more solid, opaque surfaces of the outer perimeter.

Looking at a selection of courtyard-building plans, I arrange them into a series ranging from the most conventional to the more transformed. Diagrams corresponding to each plan are later drawn to describe abstractly the process of transformation and elements found consistent in the courtyard.

Finally, Aalto's Malm Funeral Chapel is described in terms of these different elements constituting the courtyard form.
1. Jahangir Manal, India
   First floor plan
2. L'Hopital, Rhodes, France
   Plan of Rez-de-Chaussee
3. Bayt al Ghanim, Kuwait
   plan
4. Bayt al Badr, Kuwait
   plan

   (page 40)
5. Alvar Aalto, Malm Funeral Chapels
   Helsinki, roof plan
6. Malm Funeral Chapels, first floor plan
1 Study with site model
   Original: cardboards and paper at 1/32" scale
   (page 44 and 45)

2 Study of plan
   Original: clay and wire at 1/16" scale

3 Study of plan
   Original: prisma color drawing at 3/32" scale
Concept Design III

1. Charcoal sketch of plans
2. Diagrams showing territorial gain by a shift in geometry
   (page 47)
3. First floor plan
   Original: prisma color drawing at 3/16"
Once grasp the great Form without form,
And you roam where you will.
With no evil to fear,
Calm, peaceful, at ease.

At music and viands
The wayfarer stops.
But the Way, when declared,
seems thin and so flavorless!

It is nothing to look at
And nothing to hear;
But used, it will prove
Inexhaustible* 

Lao Tzu
4 Design: a Journey
A Journey

The last section of this thesis will concentrate on the development of the chapel. The final products, however, should not be viewed as an absolute conclusion to the whole process, but rather as a part of an ongoing exploration which starts to pull together some meaningful threads from the journey.


(opposite) A summary of a series of studies in three-dimensions.
A study model at 1/32" scale

A series of preliminary models at 1/32" scale
Development of studies in three-dimensions at 1/16" scale

1. Second floor
2. Angle view from Marlborough Street
3. View into chapel
Development of studies in three-dimensions at 1/16" scale.

1. Roofs
2. Second floor
3. First floor
4. View into courtyard from Marlborough Street
5. View into chapel from courtyard
6. First floor plan
The following three pages summarize my design evolution in plans, originally done at 1/16” scale with pencil on trace paper.
"...The technical systems proper came into existence through the development of building methods which were adapted to more differentiated building tasks and formal structures. The systems may conveniently be divided into two classes: massive system and skeleton systems. Both classes have many variants, and there exist transitory types and combined systems. Both the basic system types serve two purposes: the building of bounding walls, and the covering of the spaces formed in this way. We therefore have to distinguished between enclosing and covering systems. It often happens that these aspects melt together in one complete technical system, but often the two problems are taken care of by different types of system."

Christian Norberg Schulz
*Intentions in Architecture*

The following eight pages contain development studies in section.

1 Sketch of section across the site
2 Sketch of section
3 Preliminary section
1 Bridge leading to second level
2 Bridge, cross section
3 Bridge, view from above
4 Section
5 Marlborough Street edge
6 View into covered promenade on Marlborough Street
7 Slits in the wall
Study of bridge
A chapel in Back Bay
These two pages contain development studies and references of roofs.

1 Aalto, Glass Warehouse, Karhula, 1949.
2 Aalto, Typpi Fertiliser factory, Oulu, 1951-1952.
3 Aalto, Covered Stadium, Otaniemi, 1949-54.
4 Roof studies: solid surface and tensile elements.
5 Structure of a lantern, Bangkok
6 Roof studies
7 Roof studies
8 Roof planes supported by delicate wooden rods, a row house in Chinatown, Bangkok
9 Floating roofs
Chapel Story

The chapel is an inner world, withdrawn from the every-day and yet allows for different levels of engagement between the world of sanctuary and the life of community spirit. The movement into the site is celebrative, and it offers different ways in which the place can be experienced. Marching along the robust Victorian row houses on Marlborough street side, one sees the solid wall of the chapel corner repeating the same pattern of its fabric. This rough granite and brick curtain shields the inside as well as offers some clues to the pedestrians through its lighted punctures.

Standing in front of the main entrance, one sees a half-sunken reading room on the left. There is an inviting porch-like area where seats are provided for passerbys or people who wish to read their books outside. To the right standing a solid plane with narrow slits running vertically down at regular intervals. The row of columns with glazed canopy in front of it offers a temporary shelter for pedestrians or visitors of the chapel. The plane is recessed off the street curb to create a gathering niche prior to entering the chapel area.

Corner study: View towards Marlborough and Berkeley Streets intersection
Final study in three-dimensions at 1/16" scale.

1 Elevation
2 Front view from Marlborough Street
3 View towards reading room
4 Bird's eye view from the south
5 Angle view from the north
6 View along Berkeley Street
One enters the site by moving up the paved ramp which gradually opens up to the courtyard and the view beyond. The reading room wall restraining the ramp on its left directs the movement towards a small covered space. At this point the visitors can make their decision to enter the reading area by following the extending platform into the building, walk down the stairs which lead through the courtyard to the reception area on the ground level of the chapel, or continue the procession by turning up the bridge gapping between the ground and the raised chapel floor.

By moving along the bridge, one rises six feet, feeling more and more detached from the ground and the more left behind. A person anticipates the discovery at the end of this journey.

Inside the chapel, space is not contained by the definition of its surrounding walls as one might have expected. The floor is shifted at a mild angle, away from the walls all around. Broken roof planes allow light from above to shine up the place at different spots.

A row of delicate wooden columns with glazed skylight leads one down to the internal staircases which connect the chapel area to the ground level below. The territory defined by the repetition of these columns and the exterior wall vertically connects the two areas, especially with the light gleaming all the way down to the level underneath. The stream of light also directs one's eyes towards the altar which is lit up from behind by the ray coming down between the gap of the roof plane and the exterior wall.

One immerses oneself down the stairs to the reception area where the view of the courtyard and the reading room beyond become once again apparent. The lower level houses a kitchen, toilets, dressing rooms, and a small group gathering space. The reception space can be connected to the courtyard by opening up the glazed screens to allow the activity to flow outside if weather permits.
Second floor plan
Section across chapel and Marlborough Street
Section through reading room and chapel
Details of section through the chapel
By developing the design of a chapel in Back Bay, I have come to understand more about my initial inspirations of which I call heaviness and lightness.

An experience of a place can be enhanced by the interplay of certain complementary qualities, one essentially defines the other, and vice versa.

The design of the chapel reflects such qualities. Thus, it challenges my thesis exploration both through its desire to establish a continuity between the world of the sanctuary and the life of its community and its ability to offer an architectural experience distinguished from the everyday.
Verisara's Chapel
Notes

1 Low, Kevin Mark *The Dislocated Mind in the Heart of Reverie*, page 29
2 Calvino, Italo *Six Memos for the Next Millennium*, chapter 1: Lightness
3 Frampton, Kenneth *Rappel a l’Odre, The Case for the Tectonic*, page 19-25
4 Ibid 1, page 40
5 Ibid 1, page 31
6 Ibid 1, page 83
7 Wurman, Richard *What Will Be Has Always Been*, page 29
8 Orlowski, Mark *Frank Furness: Architecture and the Heroic Ideal*, page 466
9 Tzu, Lao *The Way of Life*, page 35
10 Norberg Schulz, Christian *Intentions in Architecture*, page 162
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All drawings and photographs not otherwise credited are by the author. Reference is by page number and position on page or illustration number.

page 5  
Lewcock, Ronald *Traditional Architecture in Kuwait and the Northern Gulf*, pg. 85  
(Flexiprint, Ltd., Worthing, Sussex, 1978)

page 10  
Di-Chan *Magazine*, volume 347, 15 August 1991, pg. 182  
(Advance Publishing Co., Ltd, Bangkok)

page 11  
upper left, Paknam, N. N. *Patterns of Houses in Siam*, pg. 140  
(Muang Boran Publishing, Bangkok, 1988)

upper right, Kanokpongchai, Sorngaroon, *Museum of Folk Culture*, pg. 65  
(Muang Boran Publishing, Bangkok, 1988)

(W. W. Norton & Company, New York, 1986)

lower right, Storrer, William A. *The Architecture of Frank Lloyd Wright: a Complete Catalog*, pg. 50  

page 12  
1) Broman, Barry Michael *Old Homes of Bangkok: Fragile Link*, pg. 18  
(The Siam Society, Bangkok, 1984)

2) Piorano, Carlo *Carlo Scarpa: Opera Completa*, pg. 111  
(Electa, Milano, Italy, 1984)

3) Ibid page 12, 1), pg. 18

4) Ibid page 11, upper left

page 13  
1) O’Gorman, James F. H. H. Richardson: *Architecture Forms for an American Society*, pg. 84

2) Ibid, pl. 75


4) Ibid page 20, 1), pl. 80
5) Ibid page 13, 3), pg. 180

6) Ibid page 19, 6)
7) Ibid page 19, 6)

1) Ibid page 13, 3), pl. 3-10
2) Ibid page 13, 4), pl. 14


3) Ibid page 5, pg. 117
4) Ibid page 5, pg. 116

5) Mosso, Leonardo *Alvar Aalto*, Pl. 18

Behnisch & Partners: Design 1952-1987, pg. 229

1) Ibid page 40, 5), pl. 81
2) Ibid, pl. 78
3) Ibid, pl. 82

Benjamin Van Roy
Bibliography

Calvino, Italo
Six Memos for the Next Millennium
Harvard University Press, Cambridge, 1988

Frampton, Kenneth
"Rappel a l’Order: the Case for the Tectonic" in
New Architecture: the New Moderns & the Super Moderns

Low, Kevin Mark
The Dislocated Mind in the Heart of Reverie

Rasmussen, Steen Eiler
Experiencing Architecture
The MIT Press, Cambridge, 1959

Semper, Gottfried
The Four Elements of Architecture and Other Writings

Solomon, Barbara
Green Architecture and the Agrarian Garden
Rizzoli International Publications, Inc., 1988

Wurman, Richard
What Will Be Has Always Been