Order and Flexibility:
Their Coexistence as Architectural Principle

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The design process is a means to an end. It is the vehicle one uses to reach a destination. It is driven by past experiences, the advice from others or intuition.

The thesis is a journey. For some, the destination is known before the journey even begins. For others, the destination is found somewhere along the way. For me, the destination is in sight, yet it constantly moves just out of reach. Each new discovery demands further exploration.

In the journey, the project represents all of the discoveries made along the way. Each step forward is an attempt to reinforce that which the traveller has already discovered or to inform the traveller to change directions.

Thus, what is important about a journey is not only how one gets there, but also what is discovered along the way.

"...But desire is insatiable and you cannot ever know what it is. It is renewed all the time."1

Louis Kahn
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**I. INTRODUCTION**

<table>
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<tr>
<td>uniformity</td>
<td>multi-formity</td>
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Two opposing principles necessary for architecture to endure are order and flexibility. Order is a static condition which establishes and maintains organization. It relates the parts to the whole and conversely, the whole to the parts. Order provides the rules to define what something can be and more importantly, what it cannot. Flexibility is a dynamic condition which offers diversity. It allows a user or inhabitant to manipulate or control that which the designer has provided. Such a condition allows the individual to become engaged with or a part of the architecture. However, flexibility can occur within an ordered system.

**Architecture exists where the duality meets.**

An example to illustrate this theory is a housing community for university students. Because university students typically only spend one to three years in a single residence, a dwelling which can be adapted quickly and with little effort to accommodate different needs is essential. In this case, movable interior partitions are ideal for allowing students to make changes within their units. The interior can be changed based on how the spaces are used, the time of day, season, or the number of students or family members living in the unit(s). Order is fittingly created by the structural system. Its static condition maintains organization and clarity and juxtaposes itself against the dynamic nature of the interior partitions.

Considered separately, both order and flexibility languish in that which makes them flourish. A highly ordered system alone becomes sterile while a solely flexible one becomes chaotic and unpredictable. However, the prosperity of the two depends on their coexistence.
II. PRECEDENCE
II. PRECEDENCE

In architecture, order is often created by geometry. The operations of translation, rotation, and reflection are used to establish an authority which can either be absolute and unyielding or subject to change. Whether or not this framework can be altered depends on other concerns or discoveries revealed through the course of the design process.

“One element necessary for the crystallization of architecture is pure geometry, as in the Pantheon. This is the base or framework that endows architecture with presence.” - Tadao Ando
II. PRECEDENCE

"...An inevitable element of Architecture. The necessity for order. The regulating line is a guarantee against willfulness. It brings satisfaction to the understanding. The regulating line is a means to an end. Its choice and the modalities of expression given to it are an integral part of architectural creation." - LeCorbusier

Notre Dame, Paris

house by LeCorbusier and Pierre Jeanneret, 1923
II. PRECEDENCE

“The concept of flexibility creates a building which is not a fixed entity, but a palimpsest on which can be inscribed any life style and any life view.”

- Gerrit Rietveld, *De Stijl*
Steven Holl’s concept of “hinged space” gives modern application to the versatility of the traditional Japanese fusuma sliding panel. Light, colorful wooden walls turn on pivotal hinges, making it possible to combine or isolate spaces according to hour, season and family make-up.
The origin of movable interior partitions can be traced to the Japanese fusuma. These sliding panels were constructed with a wooden frame strengthened by cross battens to which several layers of paper were glued. A layer of decorative paper was then fixed over the whole and the faces were typically painted to depict a story. The fusuma allowed the house to change with the day and season. Their dynamic nature was sharply contrasted by the static condition of the heavy timber posts and beams which brought order to the whole.
II. PRECEDENCE

when order meets flexibility

1800’s-expanding table-Robert Jupe-England

"...like a flower opening its petals." - David Linley, *Extraordinary Furniture*
III. PROJECT/PROCESS

factors, opportunities and constraints:

location:
Blacksburg, VA
three blocks east of university campus
hillside adjacent to historic building

(Built in the 1830's, the Thomas C. Connery house terminated Lee Street at Draper Road and marked the boundary of the original sixteen squares of Blacksburg. Today, it is used for university offices but it's presence marking the intersection at Lee and Draper remains.)

-new construction should complement or even enhance existing building and not have an overly imposing presence over the relatively small building

-parking lot behind existing building and street parking along Draper Road to be used by residents

-woods to the rear of the site to be preserved, offer views of nature
III. PROJECT/PROCESS

local architectural condition as project generator

intersection at Roanoke and Main Streets
(northwest corner)

intersection at Roanoke and Main Streets
(southeast corner)
III. PROJECT/PROCESS

wood block studies
III. PROJECT/PROCESS

wood block studies

"...A musical instrument has as many possibilities as the uses to which it is put. An instrument must be played. Within the limits of the instrument, it is up to the player to draw what he can from it, within the limits of his own ability. Thus, the instrument and player reveal to each other their respective abilities to compliment and fulfill one another." - Herman Hertzberger, Form as a Musical Instrument
III. PROJECT/PROCESS

translation of wood blocks into points, line planes and volumes
III. PROJECT/PROCESS

translation of wood blocks into points, lines, planes and volumes

plan diagram (lower level)
perspective view along primary axis

section

perspective view along transverse axis
plan diagram (upper level)
III. PROJECT/PROCESS

DEVELOPMENT

of a single unit
III. PROJECT/PROCESS

view of model (partitions open)

view of model (partitions closed)
III. PROJECT/PROCESS

perspective view from entry courtyard (partitions open)

perspective view from bedroom (partitions closed)

perspective view from bedroom (partitions open)

perspective view from entry courtyard (partitions closed)

perspective view from entry courtyard (partitions open)

view of model (partitions closed)

view of model (partitions open)

study model 2
III. PROJECT/PROCESS

variety provided by nature
regularity established by architecture
entry courtyard studies

"...The courtyard is an important place where seasonal changes can be directly perceived through the senses. The expression of nature changes constantly. Sunlight, wind and rain affect the senses and give variety to life. Architecture in this way becomes the medium by which man comes into contact with nature."

Tadao Ando
III. PROJECT/PROCESS

column and beam studies

One column is used in a variety of ways. Such a strategy provides moments of architectural richness while at the same time maintaining an overall unity.

"...In a body, if the bones and the insides are healthy, then the skin as well should be healthy. One cannot detach the problems of the skin from deeper unresolved problems. The critical issue is never the facade, but always the structure." - Mario Botta
III. PROJECT/PROCESS

materials and detail studies

early wall section

stackable precast block

sliding panel study

section study
III. PROJECT/PROCESS

precast panel details

appliances and fixtures "plugged into" voids in precast panels

rain catches installed atop precast panels to receive water from roof

view of model showing rain catches
precast panel studies
III. PROJECT/PROCESS

window studies

diagramatic light studies

morning mid-day afternoon

morning mid-day afternoon
III. PROJECT/PROCESS

Exterior conditions:
- Louvers adjusted to receive direct light
- Louvers adjusted to receive indirect light
- Louvers adjusted to block out light

Window studies:
- Section, elevation and components study
- Window assembly variations

Interior conditions:
- Louvers adjusted to receive direct light
- Louvers adjusted to receive indirect light
- Louvers adjusted to block out light
III. PROJECT/PROCESS

study of a dining space

[Diagram showing table raised and table lowered]
III. PROJECT/PROCESS

flexibility within an ordered system

view of model showing eight units

plan view of two units
III. PROJECT/PROCESS

flexibility within an ordered system

two units separated, partitions closed (lower left) and open (upper right)

two units joined-partitions manipulated to maintain two separate living spaces

"...What has right size is at the same time both large and small, few and many, near and far, simple and complex, open and closed; will furthermore embrace both unity and diversity." 9
Aldo Van Eyck

two units joined-partitions manipulated to create one large central living space

two units fully open
III. PROJECT/PROCESS

COMBINING UNITS
III. PROJECT/PROCESS

joining and stacking units (diagramatic studies)
III. PROJECT/PROCESS

vertical connections

axonometric view

plan showing layering of units and alignment of structure

units separated

work area is lit from above

units connected

space becomes a light well
III. PROJECT/PROCESS

DEVELOPMENT

of the site
III. PROJECT/PROCESS

regulating lines
III. PROJECT/PROCESS

outdoor spaces and contextual relationships

axonometric view showing site and immediate context

site model

detailed plan and elevation of outdoor space

detailed axonometric view of outdoor space
III. PROJECT/PROCESS

site

site plan

perspective view from street
III. PROJECT/PROCESS

REFINEMENT
of the single unit & site
III. PROJECT/PROCESS

developing an architectural language out of the triangle - study 1

-hypotenuse makes its presence as an uninterrupted linear element
-acute angles serve as links to indoors or outdoors as well as adjacent units
-right angles act as structural footholds and contain service spaces

plan: 1. entry courtyard  2. living  3. cooking  4. sleeping  5. bathroom
III. PROJECT/PROCESS

perspective studies

view of model along hypotenuse

interior perspective views along hypotenuse wall with partitions fully closed (far left) to fully open (far right)
III. PROJECT/PROCESS

developing an architectural language out of the triangle - study 2

-hypotenuse makes its presence with its thickness
it is essentially a thick wall containing the service spaces
-acute angles serve as links to indoors or outdoors
-right angles become links to adjacent units

Alternative A:
stairs contained within hypotenuse, linking units above and below
A1 - entry porch
A2 - living
A3 - cooking
A4 - mechanical
A5 - stairs
A6 - sleeping
A7 - bathroom
A8 - outdoor terrace

Alternative B:
sliding partition links adjacent units on same level, requiring an exterior stair
B1 - entry porch
B2 - living
B3 - cooking
B4 - mechanical
B5 - sliding partition connecting adjacent units
B6 - sleeping
B7 - bathroom
B8 - outdoor terrace
III. PROJECT/PROCESS

study model and details

detail showing precast corner member

precast panel detail
"...The liberated dweller, like the reader of poetry, is given many fragmentary beginnings and suggestions for meaningful experience, yet is a force who, through action, momentarily "completes" something basically incomplete." 10 - Henry S. Plummer, Liberative Space

III. PROJECT/PROCESS

detailed unit study

1. entry  2. cooking  3A. dining table raised  3B. dining table lowered  4. living  5A. partition closed  5B. partition open  6. sleeping  7. bathroom  8. outdoor terrace  9A. window louvers closed  9B. window louvers open  9C. window fully open


7 Co, Francesco D., p. 449.


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