EXPLORATION OF A GENERATIVE PROCESS: Recognition, Transformation, and Projection

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Acknowledgements

En memoria de mi Viejo quien continua siendo mi inspiracion para mejorar y llegar.
Ramon Fernandez
May 10, 1927-September 8, 1983.
To Mom...

thank you.  Toni Chastain
Maurice Smith
... and Leon
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Abstract

This work explores the interrelationship of the explicit and the implicit in an generative process.

References are presented to articulate the relationship between architectural intentions and the construction of the spatial structure that supports them.

This thesis explores the generative process for a Civic Center for the City of Cambridge, Massachusetts.

The experience of space and light replaces the understanding of our environment as a collection of objects in the landscape, and supports the need of our human experience for a sense of connection with a system greater than itself. It recognizes life as a continuous flow of experiences, spatial ones among them.

Thesis Advisor: Thomas R. Chastain
Title: Assistant Professor of Architecture
The fundamental questions are What is the human perception of space? How is it defined? What affects it? This work is not an effort to produce a chronological development of this understanding, but rather it begins with a basic assumption:

A premise that our perception and experience of space is tied to the understanding of the physical world.

Specifically, the discussion and exploration of this work will consider four fundamental issues:

First, it considers the experience of the physical world within a context defined by the continuity of space and light. This context is the subject for transformation and intervention.

Second, it formulates a frame of exploration which depends upon a sense of connection and interrelationship with a spatial system greater than itself.

Third, it pursues the continuous flow of spatial experiences.

Fourth, the Continuity of spatial experience is based on a sense of simultaneity defined, in this work, as a series of simultaneous spatial systems with differing speeds of human perception.
A discussion of a **Generative Process** may be conducted in a number of ways. For this work, it is conducted through a process of categorizing only as a convenient step to discuss the complexity of design. Actions are recognized along a **Level of Association** defined by Scale, Conceptual, Organization Systems, and Physical Vocabulary issues.

Simultaneously, the use of **References**, as precedent, defines the various **Spatial Structures**. Recognition and understanding of these provide the background information for their possible transformation under different conditions, e.g. different Conceptual, Organization, or Physical Vocabulary conditions.

This exercise will explore the generative process for a **Civic Center for the City of Cambridge, Massachusetts**. The choice of Civic uses allows for a discussion which considers issues of Public Benefit, Group Image, Meaning of Community, Organization Systems across various scales, and new uses for the Assemblage of traditional elements.
The task at hand is to consider a process which avoids designing the physical setting of large institutions as a matter of imposing a monumental form on a multitude of unwilling users.
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Declaration ... General Intent
The general intent of this work is to explore and understand, through observation and projection, some aspects that support design. The set of integral aspects chosen for this exploration only comprise a part of the totality of design. The goal is to understand a process which avoids designing the physical setting of a large institution by imposing a monumental form on a multitude of unwilling users. The intent is to achieve an identifiable character from the interaction between observer and observed. This interaction results from decisions regarding organization whose physical form and its spatial resultant, territory, support and reinforce particular range of uses.

This work is an exploration into the collective nature of the environment and the form of a community. An Urban society is a dynamic field of interrelated forces. Any order introduced within the pattern of forces contributes to a state of equilibrium, an equilibrium which will change in character with time.
Forms and their control of territories, and the observer and his associations to these territories are examined to develop a context for the study of generative principles as organizers of our physical world.

The Site chosen for this projection is known as University Park at MIT. The Site is bounded by Massachusetts Avenue to its north, Brookline Street to its west, Pacific Street to its south, and Purrington Street to its east. The Site represents availability of land to sufficiently support the size of this projected Civic development. The Social benefit of such development may be summarized to include:

For the Level of the city:

1. Support Massachusetts Avenue as the primary transport artery for the city.
2. Set up a first step for the extension to the river, to reinforce its public access and to claim the Charles River Basin for public use.
3. Recognize and support the existing Cambridgeport structure for public uses.
4. Public space to prevail over those of private use.
5. Provide an alternative social center to complement the present condition in which various groups control access to the principal social institution.

6. Restore the architectural emphasis in the city of Cambridge to those buildings of Civic importance; to complement the present emphasis towards buildings of economic importance.

For the level of the Tissue, a large number of discrete architectural interventions come together into a larger whole to fill the blank spots in the urban structure. The larger whole explores the relationship between the site, movement systems, and collective nodes of the city. To begin to understand the site as a collective node of the city and to support spatial continuity, the existing vehicular and pedestrian systems are recognized and intensify to set up territorial exchanges between the Civic Center and the residential and industrial context.
The basic intentions for the level of the tissue are as follows:

1. Intensify the pedestrian system defined by the open green spaces of Cambridgeport with the Civic Center site as a positive urban element.
2. Re-route vehicular traffic to secure a site adequate for major public facilities and to make these public and pedestrian continuities possible.
3. Restore the South West edge of the site to its proper degree of definition to support industrial and residential uses.
4. Establish the pedestrian norm as a three dimensional territory.
5. Establish the vehicular norm as the single-sided ground plane.

The Civic Center will not just be a message carrier and a facility for information exchange, e.g. walls become walls on which information flashes, but rather at a regional scale it becomes a symbol of Civic Identity and City Image. The Civic Center becomes an articulator of “Civic aspirations”
and a potent spatial organizer of social reality. At a local scale, the physical setting supports a multitude of uses and affirms a strong sense of place which supports our sense of personal identity. Traditional ways of Spatial Organization define the physical world to support an infrastructure for an open future of options and opportunities.

Any interaction with or intervention in a place speaks of meaning. The search for meaning for any existence, physical or experiential, lies in a shared and cultural attitude towards what surrounds us. The story of emotion is the story of three-dimensional space. The ritual of a site is defined as the process of bringing a place into a different existence. It is a transformation of existing relationships.

Orientation in space is the framework of cognition, it is a source of emotional security. Deeper levels of meaning arise from fundamental feelings of security and identity.
The city government and citizens of Cambridge aspire, for the level of the city, independence of the city image, sense, and experience from Harvard University and MIT. There is more to the city than its prestigious institutions. Presently the sense of the city is dominated by the two socio-political and economic magnets and their spheres of influence. Harvard University currently dominates the area bounded by Putnam Avenue, to Western Avenue, to the Charles River, to Fresh Pond Parkway, to Huron Avenue, to Concord Avenue, to Massachusetts Avenue, to Everett, Hammond, and Museum Streets, to Francis Avenue, to Summer, Prescot, and back to Massachusetts and Putnam Avenues. MIT’s sphere of influence extends from Commercial Avenue, to Binney, Portland, Harvard, Windsor, Landsdowne, and Sidney Streets, to the Charles River and back to the Longfellow Bridge. Cambridgeport, which lies physically between the two spheres of influence, currently suffers from the greatest pressure from institutional expansion. East and North Cambridge define the North and West edges of the city.
For the level of the City, the intentions are to do away with large continuous areas of exclusion tolerating only small inequalities of access between different groups to create the new city identity from a purposeful exchange between systems of organization.

The transportation structure is a nodal organization anchored by Massachusetts Avenue connecting the city nodes, Harvard, Central, Porter, and Kendall Squares.

For the level of the tissue, the intentions pursue an understanding of continuous flow between territories to do away with a subdivided and compartmentalized structure. The intent is to pursue a physical continuity achieved from a field organization of the collective parts of the Civic Center. The open spaces as collective parts, define the territories and movement around it. Such organization allows for visual continuity and continuity of light providing for a Civic Center as an urban refuge that explores the impact of perception on three dimensional spatial awareness.
Space and illusion as "virtual space" become simultaneous layers of understanding. The open space for each territory is to be interpreted in a different way allowing for a range of meanings and association.
Declaration ... Initial Recognition
The projection for this exploration proposes a Civic Center for the site known as University Park. This exercise includes an understanding of the levels of the tissue, support, and unit. The goal is to explore a Civic Center where people can interact directly and where there is a balance between a public order and private expression. Such balance pursues an alternative to the institutional complete and singular collective buildings we have experienced and have accepted as the contemporary norm. Presently, MIT and Harvard Universities are the symbols which shape our sense of the City of Cambridge. The attempt is to consider a Civic Center to complement our present sense of the city and also to begin to support a more inclusive sense towards its residents. A Civic Center as a synopsis of the City of Cambridge.

The selection of Civic uses is a response to restore the present lack of balance between the institutional and the public/collective in this city. This selection is to begin to explore alternatives to relieve the residential sections of the city from the existing economic pressures experienced from the desire and need for institutional expansion.
The Civic Center is to reinforce the "place" of Cambridge whose identity concerns almost everyone and whose symbolic force is that of an inclusive city. The City’s force assumes equal importance to its institutional tradition. The ritual of a site is the exploration to bring this place, a Civic Center, into existence. The ritual is to pursue how a place gets its meaning and to articulate its story as the story of emotion or the story of three dimensional space. A Civic Center to manage the sense of a place for public purpose and social benefit.
Level of the City

Level of the Support and Unit

Level of the Tissue
Declaration ... Level of Intervention
Architecture is the product of the relationships between levels, each autonomous with its own principles and each in support of the next level of intervention. The basis for the understanding of existing contexts and for projection is organized according to particular levels or sizes of intervention. They include:

The **Level of the City** includes major transportation arteries, major public functions and facilities, and the designation of density and use of urban areas.

The **Level of the Tissue** is that intervention between the level of the city and the level of the support. It is that scale where a number of discrete architectural decisions come together into a larger whole and are integrated with public collective and movement to define areas in the urban structure. Interventions at this level are based on intentions related to relationship between the site, movement, and the major collective nodes of the city.

The **Level of the Support** is clearly defined by the boundaries of the site. The Level of the Unit is defined by the boundaries of the building, and the **Levels of the Room and Personal** completes the architectural range of sizes.

The amorphous and additive character of all new towns—their heterogeneous monotony—is the immediate result of the complete absence of right-size. Those urban functions which were not forgotten were compartmentalized. The actual building elements were subsequently arranged academically according to a trivial habit, and the open space between them is so casually articulated and emptied of every civic meaning that they loom up like oversized objects, pitilessly hard and angular, in a void. Within the tyrannical periphery of such objects there is no room for emotion; nor is there in the resulting emptiness between such objects. Emptiness has no room for anything but more emptiness. All urban ingredients curdle, all urban colours clash. Just planned wasteland.

-Aldo van Eyck
The categorizing of levels of intervention is a convenient way to focus on particular issues. The experience of a place is not so neatly compartmentalized, thus each level is in transformation to develop the intrinsic properties of the next one. This transformation results in the continuity of experience of a place through simultaneity of association with the different sizes present in our physical environment.

For this design exploration, the Level of the City recognizes intentions for the Civic Center location. The operating spatial systems extend from the regional size to the level of the Tissue and the spatial exchange between these.

The Level of the Tissue transforms existing conditions in Cambridgeport to build intentions which support the Civic Center Institution. Here a transformation is necessary to move from the residential or industrial sphere that exists to one in which the form of a community can be explored. The operating spatial systems for this level are related to movement and collective spaces and the spatial exchange between the systems at the Levels of the Support and the Unit.
The **Level of the Support** builds upon intentions regarding Massachusetts Avenue, the implied public direction in Cambridgeport, and the site edges.

The **Level of the Unit** recognizes intentions related to the spatial exchange between the system of site access and the unit.
"I shall begin with a brief clarification of concepts. First, the meaning of analysis. The term is most frequently applied to chemical analysis. A certain compound, for example, is widely sold because of its excellent effects. The manufacturer’s commercial success arouses the curiosity of other manufacturers and they send a sample of the product to a chemist for analysis. He must proceed methodically in order to break the product into its ingredients. To solve the riddle. In another case a food or beverage is harmful to the health. Again the chemist is called in to disclose the harmful ingredients. In both cases the given is a whole consisting of various unknown parts; the problem is to find the ingredients. In our business the motives for analysis are naturally different. We do not undertake analyses of works because we want to copy them or because we suspect them. We investigate the methods by which another has created his work, in order to set ourselves in motion. This approach should save us from regarding a work of art as something rigid, something fixed and unchanging. Exercises of this kind will guard us against creeping up to a finished product hoping to pick off what is most striking, and to make off with it... We are artists, practical craftsmen, and it is only that in this discussion we should give priority to matters of form. But we should not forget that before the
formal beginning, or to put it more simply, before the first line is drawn, there lies a whole prehistory: not only man’s longing, his desire to express himself, his outward need, but also a general state of mind which derives him from inside to manifest his spirit in one place or another. I emphasize this point to avoid the misconception that a work consists of only form. But what must be stressed even more at this point is that the most exact scientific knowledge of nature, of plants, animals, the earth, and its history, or of the stars, is of no use to us unless we have acquire the necessary equipment for representing it; that the most penetrating understanding of the way these things work together in the universe is useless to us unless we are equipped ...with the appropriate forms; that the profoundest mind, the most beautiful soul, are of no use to us unless we have the corresponding forms at hand. Here we must forget about the isolated stroke of luck which may enable the dilettante just once to produce a successful work which puts the professional to shame. After these general preliminaries. I shall begin where form has to begin: with the point that sets itself in motion.

Paul Klee,
The concept of analysis....
Use of Reference Examples

1. Recognition and understanding of spatial archetypes and their transformation under different conditions

2. Understanding of the physical and spatial structure and identity of any context to formulate a range of possibilities for projection in any location

3. Identification of Generative Principles for evaluation

4. To develop a way to translate the observation of desirable qualities in a context into a projection of these into a design

5. To bridge the gap between analytical thought of any experience and the simultaneity of design
Level of the City: Split, Yugoslavia
Split, Yugoslavia

Geographic Location
Old City: Inhabitation of Roman Palace and Medieval Extension Beyond the Original Walls
Roman Palace
Medieval Extension Beyond Original Roman Walls
Organization of Collective Elements and System of Through Access
Through Access and Collective Elements with Adjacent Spatial Systems
Collective Element A and Through Access
Collective Element B and Through Access
Collective Element C and Through Access
Northwest Quadrant of Roman Palace Inhabitation
Spatial Structure
Northeast Quadrant of Roman Palace Inhabitation
Southwest Quadrant of Roman Palace Inhabitation
Northwest of Medieval Extension Beyond Original Roman Walls
Spatial Structure
Northeast of Medieval Extension Beyond Original Roman Walls
Southwest of Medieval Extension Beyond Original Roman Walls
West of Medieval Extension Beyond Original Roman Walls
Split, Yugoslavia
Recollections

...feels like a known place... very much at ease with the physical surroundings although they are quite different in its building elements from our daily experience. Curiosity and fine weather bring us to walk through the city, I smile constantly and continue to walk for my entire stay. Day by day, I begin to understand the city and its people. There is no limit to where we go but the understanding of the different parts of the city begins to unveil. As I walk, I begin to expect where the street cafes can be found for a quick refreshment. I sense where wet laundry is to be hung before I walk by it, I begin to understand where children will be playing before I hear their voices... feels like a known place...

Walking is no longer a link between two points, it is beyond a right or left turn. It becomes a complete experience of a place. A place where one anticipates, where one is assured and confirmed. The busy streets set up the stage for the sand lots where children play, the places for afternoon walking and looking begin to explain the private corners of the city. One part is not separate from the others, but rather it is always experienced as part of the whole... a whole which is with you... always understood.

I try to remember the reaction of other international INDESEM '88 participants visiting Split as I was. I remember their smiles, but I remember them lacking the enthusiasm for Split which I felt. Was Split taken for granted?.

What do I recall from Split...? People everywhere... not tourists as April was too early for the season, but residents of the City of Split everywhere. Walking, talking, sitting, looking... I recall the sense of the place. A corner where good "burek" was found, a set of steps where one could sit and look, a large open area where the highest density of cafes were located. All different parts of the whole, all needed to understand the place called Split.

The experience of Split became the experience of a balance between individual identification and a collective understanding. Looking back, the overpowering experience of the Old City was one of identity and character... there is no other Split.

Split, Yugoalavia-April 1989
Level of the Tissue: Cambridgeport, Massachusetts
Cambridgeport, Massachusetts
Cambridgeport: Association with Public Movement / Extension
Cambridgeport: Organization of Collective Elements and their Connections
Cambridgeport, Massachusetts
Cambridgeport: Collective Elements and Pedestrian Realms
Cambridgeport, Massachusetts
Cambridgeport: Projection Site Public Access
Cambridgeport, Massachusetts
Cambridgeport: Relationship Between Public Movement and Collective Element 1
The Collective Element 1 is carved out from the Tissue Structure as a result of the branching of the East-West movement system.
The public direction in Cambridgeport defines the banding of territories (approximately 200 feet wide) extending from Massachusetts Avenue to the Charles River Basin. These bands are subdivided by East-West movement (pedestrian and vehicular) into city blocks. The relative independence of the city blocks width within any banding in relation to its adjacencies, defines the spatial understanding of Movement Branching about the collective space. Branching occurs as the result of lateral displacements between East-West movement locations for adjacent bands.
Cambridgeport: Relationship Between Public Movement and Collective Element 2
The Collective Element 2 provides the reference for the association of the collective space along a major transport artery. The Interruption of the Public Direction in Cambridgeport along the Charles River Basin sets up the understanding of the normal public artery by allowing the extension of this collective territory beyond the banding structure of the Tissue.
The Collective Element 3 defines the Internal (to City block) collective. This example is bounded by major public directions in both north to south and east to west movement. The collective element is isolated from the adjacent structure by a circular organization of privacies.
Cambridgeport: Relationship Between Public Movement and Site for Projection
The Collective Elements 1 and 2 provide for the basis to project the initial intentions regarding issues associated with the Level of the Tissue.

The Collective Element 1, Movement Branching, provides for the location of the Projection Site's major collective space and its size.

The Collective Element 2, interruption of the Public Direction along a major transport artery, provides for the carving out of sufficient land for Civic Use development and the recognition of the major public way, Massachusetts Avenue.
Level of the Support
Benisch & Partners: Vocational School in Herrenberg, Caretaker's house
Benisch & Partners: Vocational School in Herrenberg, Caretaker's house

Spatial Structure Construction

Relationship between rocks in space
Spatial Construction of territory between rocks

Relative Independence of roof planes as vertical demarcations
Alvar Aalto: Parish Centre in Detmerode, Germany
Alvar Aalto: Parish Centre in Detmerode, Germany

Spatial Structure Construction

Relationship between Support (staff spaces) and Object (meeting hall)
Construction of Spatial relationships for Support Territory: Privacy direction and the construction of a territorial corner
Claudio Caveri and Eduardo Ellis:
Iglesia de Nuestra Señora de Fatima, Matinez, Provincia de Buenos Aires, Argentina

1) iglesia; 2) bautisterio; 3) confesionario; 4) capilla; 5) despacho parroquial; 6) sala de estar; 7) despacho cural; 8) jardín; 9) patio; 10) sacristía; 11. Una vista de altar desde la nave transversal.
Claudio Caveri and Eduardo Ellis:
Iglesia de Nuestra Senora de Fatima, Matinez, Provincia de Buenos Aires, Argentina

Spatial Structure Construction

Spatial Archtype: Church and Cloister
Spatial Structure Transformation of Archtype to consider urban site

Spatial Construction of Privacies in relation to movement
Aldo Van Eyck: Addition to the Rietveld House, Holland
Aldo VanEyck: Addition to the Rietveld House, Holland

Spatial Structure Construction
Spatial Archtype: Partial Containment (projected)

Opening up of partial containment (rotation of leg) and its containment

Association of spatial rotation through the construct of movement from the original house to the addition and from the addition to the outside as legs of the triangle which constructs the angle of rotation
Frank Lloyd Wright: Taliesin West, Scottsdale, Arizona
Frank Lloyd Wright: Taliesin West, Scottsdale, Arizona

Spatial Structure Construction
Dimensional Construct

Spatial Structure Construction:
1. Collective elements in relation to public movement
2. Public territory, private residence, and support territory in relation to public movement
3. Territorial corner exchanges
Kenzo Tange: Communication Center, Kofu, Japan

Spatial Structure Construction

Dimensional Construct

Spatial Structure for Form of Light
Hans Scharoun: State Library, Berlin, Germany

Spatial Structure Construction
Dimensional and Sectional Spatial Structure Construct in relation to Public movement (extension from focal programmatic territory: reference, etc).

Construction of relationships between the three dimensional collective space and the multi-story territory.

Construct of the Form of Light.
Herman Hertzberger: Sint Joost Academy of Art Extension, Breda, Holland
Herman Hertzberger: Sint Joost Academy of Art Extension, Breda, Holland

Spatial Structure Construction
Dimensional and Sectional Spatial Structure Construct to achieve a relationship between movement from outside to inside and the reconnection back to the outside through the Form of Light and the alternative street at the second level.
Benisch & Partners: Luginsland Kindergarten, Stuttgart, Germany
Spatial Structure Construction
Hans Hollein: Museum, Monchengladbach, Germany

Spatial Structure ( ? )
Alvar Aalto: Library of Mount Angel, Benedictine College, Mount Angel, Oregon
Alvar Aalto: Library of Mount Angel, Benedictine College, Mount Angel, Oregon

Spatial Structure Construction
Dimensional Construct

Three dimensional space occurs at exchange between the Field (support spaces) and the Object (fan topology)
Maurice Smith: Own Residence, Harvard, Massachusetts

Spatial Structure Construction

Form of Light provides for the Spatial Exchange between the various directions
Cambridge, Massachusetts
Indicates site for projection
Level of the Tissue: Cambridgeport
Indicates site for projection
Civic Center Projection Site

Massachusetts Avenue

Brookline Street

Landesdowne Street

Purinton Street

Pacific Street
Civic Center Projection Site: Level of the Tissue Intentions

Public Direction

Containment of Public Direction
Conceptual Sketch
Civic Center Projection Site:
Transformation of Cambridgeport Spatial Structure to Construct Level of the Tissue Intentions

Cross, center controlled
Edge controlled
From edge controlled to Space controlled
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Civic Center Projection: Partial Process Model
Spatial Structure Construction of Level of the Tissue and Support Intentions
Civic Center Projection: Partial Process Model
Spatial Structure Construction of Level of the Tissue and Support Intentions
Civic Center Projection: Partial Process Model
Spatial Structure Construction of Level of the Tissue and Support Intentions
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Load Bearing Wall to Frames

Load Bearing Walls  Solid to Light reversal: Building System replaces Light openings. Light replaces walls
Directional Frames
Civic Center Projection: Spatial Evaluation of Building System

Herman Hertzberger: Centraal Beheer Project Building System

.... defines the structural grid
____ defines the territory gained
Form of Light option

Partial Plan
Civic Center Projection: Spatial Evaluation of Building System

Herman Hertzberger: Centraal Beheer Project Building System

... defines the structural grid
___ defines the territory gained

Partial Plan
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Centraal Beheer Building System to include a Direction Change

---

defines the structural grid

defines the territory gained

Partial Plan
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Centraal Beheer Building System to include a Direction Change

\[ \ldots \ldots \text{defines the structural grid} \]
\[ \ldots \ldots \text{defines the territory gained} \]
Partial Axonometric

Form of Light option
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Centraal Beheer Building System to include a Direction Change

Partial Plan
Partial Axonometric
Civic Center Projection: Spatial Evaluation of Building System
Spatial Transformation of Centraal Beheer Building System to achieve a larger and optional
Light Territory

Partial Plan
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Centraal Beheer Building System to achieve a larger and optional Light Territory

Partial Plan

---

defines the structural grid
defines the territory gained
Form of Light option
Partial Plan
Civic Center Projection: Spatial Evaluation of Building System

Spatial Transformation of Centraal Beheer Bldg System to achieve a larger optional Light Territory
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Performance Hall Archtype  Site Location Intentions  Spatial Structure
Civic Center Projection: Performance Hall Partial Plan, Spatial Structure Construction

Archtype

Partial Plan

Dimensional Construct
Partial Plan
Civic Center Projection: Performance Hall Partial Plan, Spatial Structure Construction

Archtype Transformation

Dimensional Construct

Partial Plan
Spatial Rotation

Partial Plan
Civic Center Projection: Performance Hall Partial Plan, Spatial Structure Construction

Dimensional Construct

Partial Plan
Civic Center Projection: Performance Hall Partial Plan

Spatial Structure Intentions
Partial Plan
Spatial Structure Construct

Partial Plan
Civic Center Projection: Performance Hall Partial Process Drawings

Spatial Structure Construction

Partial Plan
Civic Center Projection: Performance Hall Partial Process Drawings

Spatial Structure Construction

Partial Plan
Declaration ... A Projection for a Civic Center

I HAVE SEEN THE FUTURE AND IT GOES BEEP-BUP-BEEP!
The City of Cambridge Community Development Department provides the following scenario:

The year is 1990, the City of Cambridge Massachusetts embarks on the largest public project of this decade. The goal is to pursue an understanding of its infrastructure for the 21st century. Until this time, its identity has been dominated by the strengths of its cultural and scientific institutions. Cambridge, as it looks to its future, aspires to an identity which builds upon its history to pursue an innovative physical structure to support and encourage the role of its citizens in its future.

Today's urban life is supported by production, management, and financial systems. It is anticipated that it will grow to include public communication, monitoring, and mass information. Technology may become in the 21st century the thread that reinforces all modes of support for urban life. Advanced information technology becomes the focus for exploration for its physical implications within the infrastructure of the 21st century. The city government and citizens understand and
demand an approach which avoids the local, pragmatic, and incremental responses typical of present planning practices. They demand an approach to assimilate a set of new criteria and values. Instead of merely accepting technological innovations, users aspire for future municipal planning to avoid the conflict between tradition and innovation. Users aspire for an understanding of the possibilities for collaboration and exchange between all modes supporting urban life, including advanced information technology. Users aspire to match technological ingenuity with sensory purposes based on the understanding that advances in science and technology make for genuine progress only when they are designed to satisfy social purposes. Advanced technologies are the new elements to reinforce traditional activities, they do not substitute them, but rather reinforce the open field of opportunities for the future. The City recognizes the changing industrialized world will receive a new era of development, a transition from an industrial economy to a post-industrial or information economy. It is becoming apparent that in this new stage an
enormous increase in the rate of transmission and processing of information will occur. In the past, the physical impact of similar increases on cities has been substantial as exemplified by the automobile and previously the electric power and the railroad. Thus the Civic Center is the first attempt to pursue an understanding of the profound impact of electronic information on Cambridge and today’s cities.

The information revolution, as an extension of our senses and our mind, will affect our patterns of working and living. Of interest is the spatial recomposition at the range of levels from the City through the level of the person associated with this revolution. The consideration is the relation between technological development and spatial processes.

A Civic Center allows for a broader exploration of the impact of new technologies on spatial systems from the sense of a region to the sensations of everyday life.

The City and its citizens identify the fundamental issues involved. They include, a search for the ways activities and experiences will be changed through the information revolution, the transformation of the balance of public and private
spaces, and the change in the urban consciousness and identity.

An objective is to open up new possibilities of spatial organization and to avoid the invasion of the Civic Sector with the fragmentary replacement of abandoned public monuments with the new electronic elements.

The information revolution and the technology question cannot be constructed in terms of discrete and separate technological tools which can be used or abused. The question is posed in terms of the coexistence of this new element and its system with existing social and spatial systems to constitute the urban structure for the 21st century.

The interest is the nature of the new information system, as a positive new consideration, and its impact on urban systems in particular the urban spatial structure.

The regional profile of the information revolution is an affirmation of mobility presenting a tendency towards the urbanization of society. In this respect, the understanding of the physical world as an ongoing experience of the continuity
of space and light with optional discontinuities as confinements shares with this profile of the information revolution. The norm of motion as a positive experience in our world, as Castells stated, "... (is) an emergence of a space of flows substituting for a space of places whose meaning is largely determined by their position in a network of exchanges."

The City recognizes the conflict between the weight of existing infrastructures and the projected possibility for the inclusion of technical developments. The citizens of Cambridge aspire to prevent a fragmented society achieved through a discrete articulation of the information technology. Such discrete articulation results if the level of intervention is reserved to only intelligent households which only apply at the size or level of the unit. The result of such action would be the erosion of the public sphere. This approach to construct discrete discontinuities does not support the "space of flows" inherent in the new information technology and inherent of the experience of space as an ongoing continuity.

The enhanced understanding of municipal planning incorpo-
rates the information system as an important new factor in its organization. For a Civic Center, which assumes primal importance as a symbol of the identity for the regional experience of this city, its generation is not attained from a substitution of one monument with a new one. It is generated from a simultaneous layering of organization systems, some which have been traditional considerations, others which extend to incorporate the advanced information technologies. All pursue the elusive notion of the future for the City of Cambridge: a future where means of message exchange and information handling are dramatically evolving to present a fundamental challenge for the understanding of how this evolution will alter and affect concepts of place and time. Advanced information technologies will greatly influence the rate that we gain knowledge from perception by making information more readily available. The challenge becomes an exploration for a method of work to understand all interventions as an affirmation of social behaviour as influenced by our interaction with the physical environment. Social behaviour is
spatially defined, the deepest meaning of any place is its sense of connection to human life. The consideration of the future and its capacity to affect concepts of space and time becomes a consideration of how these new elements can reinforce our perception of the physical world. In the past, municipal planning has often been a matter of imposing a monumental form on a multitude of unwilling users.

Infrastructure speaks of a regional scale and introduces the notions of identity and character. The search evolves to understand how the elements of the infrastructure for the 21st century affect our social behaviour which is local and spatial. The Civic Center as a symbol of an identity must directly consider this question, as it is both the identity and the local intervention into existing physical, social political and economic relationships. Advanced information technologies will define the "virtual space" as that extension of where you are, that extension of your spatial understanding. It will enhance the transfer of knowledge by perception.
The mechanics for our perception of space rely on everything moving but at different rates of speed generating an active awareness that more accurately fixes one in space and makes the world around more three dimensional. The experience of space is the experience of movement. The elusive notion of the future enhances our movement beyond our physical mode by projecting us elsewhere. This opportunity is to reinforce the deepest meaning of any place by reinforcing its sense of connection to human life. Information systems have become an environmental dimension, the physical boundaries of a traditional place will always be there. The attempt is to understand the advanced information technologies not as a perforating, dissolving, and substitutitional phenomenon for physical boundaries but rather as an additional layer of collaboration to define our physical world and a new organization system. The understanding of the new advanced information system as a substitutional phenomenon of the traditional place reduces the system and its boundaries to a mere attribute of the environment as opposed to an organizer of the environment. It reduces the new system to a list of new elements which replaces the traditional list of other elements.
The general intent for a projection for a Civic Center can be summarized as follows:
The instantaneous channels of the information and communications networks can overcome geographic and locational limits. The objective is to open up new possibilities of organization and spatial flexibility to construct an unique space time which transcends locational and chronometric constraints. The fundamental change is the creation of a new (electronic) spatial and temporal order. The electronic network geography is mapped on "abstract" space. For the level of the city, which includes major transportation arteries, major public functions and facilities, and the global designation of density and use, the new channels of information and communication networks continue, reinforce, and intensify the existing ongoing movement achieved from major transportation arteries. The new network allows for movement through the "abstract" space as an intensification of physical movement. It generates opportunities to associate with the urban structure both physically with ongoing movement or abstractly through a new electronic order. Our awareness, as
urban association, of a range of levels is reinforced by our enhanced direct relation with the urban structure through new information and communication networks. For this level of intervention, the Civic Center acknowledges the new technology as a system of continuity. A system which continues, reinforces, and intensifies the spatial continuity at the level of the city. It is not an "either/or" alternative to our experience of the ongoing field of space and light, but rather is a presence which is optional, additive in relation to the spatial continuity, and self-stable.

The form of exchange between the major transportation and the new technology systems recognizes the nature and level of intervention.

The Form of the city’s access to the abstract space of the new technology directly restores access to different groups. The form of exchange between transportation and the new technology is the form of access to the abstract space.
Declaration ... MIT Formal Therapy
In General

Bird's Eye View: Non-participatory

Scientific Perspective: Precise, Measured

Simultaneity
The nature of place speaks of explicit recognitions as well as implicit considerations. The explicit articulates the attributes associated with the physical definitions, the implicit speaks of the story of a place as the story of the ongoing experience of space and light. They reflect the transformation of light to define our associations.

The explicit articulates the "how", the implicit articulates the "why".

Human perception and experience of space are active and creative, we are involved screening and structuring what we perceive with our senses. A Spatial component is involved in all experiences. That which is known is done so with a spatial reference, dimension, or anchor. Thus the perception of space is relevant to an unity of the internal and the environment.

Space inside was our first manifestation of creating our universe, this in response to the need for protection against external forces.

"Architecture is the first manifestation of man creating his own universe, creating it in the image of nature"
-LeCorbusier

"... as a result of that new device—the reinforced concrete frame which made solid structural walls superfluous—the glass partition cult became rife. Consequently, many a transparent overall space in which it stood more or less intact, failed to provide any sort of visual termination, implying that there was no "space" in the first place, and hence nothing which required keeping intact. Space simply collapsed in that blind craving for openness. Not only gravity was to be done away with, but the horizon as well."
-Herman Hertzberger
Protection was achieved through the use of isolating and complete forms which clearly seperated the Space inside from the adjacent hostile territories. The necessity to think early on in terms of complete forms, defined Space Inside as an Object seperate from the surrounding continuity of the physical world. Thus Space Inside as Object and Object as pattern became the rule. Often what remains from the fragmentation of functions into seperate units is the thinking of Space as a collection of Objects in the landscape.

Today, we realized the dominance of space and movement and the understanding of Solid as the product of movement in space. Social changes and technical innovations affirm the evolution from the concept of Solid as dominant association, to the acceptance of space as dominating. Our understanding of Solid evolves to an understanding based on the perception of its capacity to block light directly.

In order to be at home in the universe man tends to fashion it in his own image, accommodate it to his own dimension. Constructed enclosure as such was indeed seldom sufficient, for there was always the limitless exterior beyond-the incomprehensible, intangible, and unpredictable-harassing his right composure, shaking whatever “ground of certainty”, to use Rijkwurt’s phrase, he was able to find. So his cities, villages and houses—even his baskets—were persuaded by means of symbolic form and complex ritual to contain within their measurable confines that which exists beyond and is inmeasurable to represent it symbolically. The artifact, whether small or large, basket or city, was identified with the universe or with the power or deity representing the cosmic order. It thus became a “habitable” place, comprehensible from corner to corner.

-Aldo van Eyck
This thesis discusses and explores four fundamental issues.

**First**, it pursues the difference between the understanding of the built environment as a collection of solids and its understanding as the ongoing experience of space and light.

**Second**, it accepts and embraces a frame of exploration which understands the importance for achieving aesthetic satisfaction from a sense of connection with a system greater than oneself, the more nearly universal the system the deeper the satisfaction.

**Third**, it recognizes that life is a continuous flow of experiences. Each moment is preceded by a previous experience only to become the harbinger of future ones. Movement through space creates the continuity of experience, thus the organization of movement systems defines the context in which to experience the Go and the Stop.

**Four**, the understanding of Simultaneity as the continuity of spatial experiences achieved from a series of movement systems based on different rates of speed and different Paul Klee diagrams
modes of movement, each contributing its part to the total experience of our physical environment. The freedom of simultaneity is the freedom to dissolve rigid form. Rigid form, defined in this work, as form possessing singular associations.

A basic design goal is to articulate perception sequences shared by people to develop a group image from shared experiences and give a sense of order where individual freedom and option is possible.

The sensory qualities of the built environment are the look, sound, smell, and feel of place. Two types of desirable places are those which are the result of a process of slow development informed by constraints of a natural condition that have been enriched by continuous habitation and reformation; and those places where the design was closely fitted to the requirements of the persons who were to use them and who had some power to affect the outcome.

The way we respond to the built environment is tied to the specific qualities of the place. Our response is territorial, it is...

"... no matter how absorbing the elaboration down to the smallest part may be, the essence of the larger whole remains as powerful as ever. The whole radiates the calm of an equilibrium which encompasses an extraordinary intricacy of form and space in one single image ... Orphange in Nagete by Aldo van Eyck.

-Herman Hertzberger

"True architecture...cannot be broken up into different pieces, each of which is autonomous and exists alone. A fragment of architecture will be no more than an odd, mutilated object that ceases to exist when it is removed from the one place where it belongs."

-Juan Gris

"The phenomena of the environment do not exist as separate elements but are experienced in relationship to each other."

-Christian Norberg-Schultz

"Structure, in its basic sense, is the created unity of the parts and joints of entities. It is a pattern of dynamic cohesion in which noun and verb, form and to form, are coexistent and interchangeable, of interacting forces perceived as a single spatio-temporal entity."

-Gyorgy Kepes
spatially defined and changes according to place. Our association depends on the mutual recognition of boundaries.

A place can be evaluated by finding out how clearly its territories are marked to support the desired range of uses, and how well users understand and agree on their meanings.

A discussion of Spatial evaluation assumes the fundamental assumption that the experience of Place depends on its spatial structure. The concept of Structure assumes that architectural intentions can be constructed. Thus, Structure is defined as a general and abstract concept which refers to a system of principles or arrangements destined to cope with forces at work. Construction is defined as the physical realization of a principle which may be carried out in a number of ways depending on the elements used. The visual result, when a structural concept finds its implementation through construction, will affect us through certain expressive qualities.

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"As one moves in space everything moves but at a different rate of speed generating an active awareness that more accurately fixes one in space and makes the world around become much more three dimensional."

-James Gibson

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which clearly have to do with the play of forces and the corresponding arrangement of parts.
The exploration of the generative process for a Civic Center for the City of Cambridge begins from the recognition of existing spatial structures regarding public direction, and collective nodes. An exploration into the Form of the Community recognizes the existing conditions to identify the range of possible transformations.

Human action defines our experience. A recognition that the forces which affect our experience exist in some order defines the manner in which we observe the built environment.
The Form of the Community is tied to the existing spatial structure because it provides for the foundation of our association with the place called Cambridge.

Our movement and projection grounds us in our three dimensional space by enhancing our perception of the relative motion of things in space. Our spatial experience is our response to the external stimuli or the forces we perceive.
Spatial experience, in general, results directly from the nature of the place and the nature of human perception. The nature of place embodies the quality, and its physical realization. The nature of human perception embodies the knowledge gained by perception and the knowledge gained by thought.

Spatial experience may be discussed by identifying the source of our association in response to the perceived stimuli. That is, the when, what, why, and how of such recognition. The first three queries refer directly to the nature of the place, specifically how the particular socio-political, economic and physical context defines it. The last query refers to the nature of our perception which enables us to engage with the context we see and feel.

Any architectural intervention is a affirmation of a context, a affirmation of an existing order. Existing qualities, conditions, and forces affect the process of intervention. Every decision serves as reference for a future decision.
The nature of place relies on three basic relationships each of which simultaneously reinforce and support a particular range of associations and use intentions. The three relationships include a conceptual level, a level of organization systems, and a level of physical vocabulary. Any architectural intervention, independent of size, depends on a basis for understanding these three levels of association.

The Conceptual Level considers the general and abstract notion of the place articulated to explore the programmatic content. It is expressive of a principle to concept and it is manifested through our implicit recognition. In part, the conceptual is articulated by its tonality. Tone is defined by the emotions and feelings induced by our interaction with the physical surrounding and includes the sense of awe, fear, violence, restfulness, peace, etc. The capacity for recognition and interpretation of such lies in our desire to engage with what surrounds us as stimuli and to what extent we perceive and respond to such stimuli.

"The essence of perception is selective attention to something important." - James Gibson

"Two conclusions follow with regard to perception: First, it depends on stimulation; and Second, it depends on the interests of the individual observer." - James Gibson
One pursues and articulates a conceptual level to bind together perception sequences to generate a shared identity or character, as a product of an implicit system formulated over time. Its capacity to convey meaning and symbolism depends on our interaction with such intervention and how well it supports a shared understanding of its perception. This is a group image from shared experiences.

The Second level of association considers **Organization Systems**. It builds upon an acceptance that orientation in space is the framework of cognition and is necessary to secure a sense of emotional security. It speaks of the recognition of an order which exists, and which is transformed through our intervention to support the dialogue between intentions, concepts, and generative principles. This level is a system of principles to cope with forces at work. Its basis relies on our understanding of how we perceive space. Our association reflects the recognition use.

The second level of association affirms our understanding of what surrounds us.
The third level of association is the **Actual Physical Realization** (vocabulary) of our intentions which are achieved through a system of elements. It implements the dialogue between concept and organization principles. It is the explicit expression of the relation of form to force. This level recognizes the multitude of possibilities, depending on the elements used, for an expressive quality to be carried out into reality. The chosen elements contribute to our experience of a place with intrinsic qualities. These intrinsic qualities define the sensous quality of a place. They effect the look, smell, sound, and touch of the place. This level of association identifies physical vocabulary as tools, elements, or specifics employed to achieve a conceptual association. It recognizes and uses the specific physical attributes at hand to reach a shared set of agreements regarding content.
The individual identity and character of the intervention is the product of two systems. First, it is an implicit system based on shared experiences. Second, it is the physical structure of the intervention which is the product of an explicit system based on the understanding of formal behaviour and physical attributes. These two systems, implicit and explicit, define the norm and the range of possibilities it may sustain. The range of possibilities consider the specific issues, requirements, and goals at hand while the norm supports the coherence of the whole in relation to the physical world around it.

"... not create a new kind of vision, but to educate our attention."
-James Gibson
Generative Process

Douglas Graf Diagram of Louis Kahn's Salks Institute

H. Allen Brooks Diagram of F. L. Wright Destruction of the Box
Douglas Graf Diagram of Le Corbusier's Ronchamp

G. Boehm, Conceptual Sketch for Performance Center
Space experienced through light is dominating. Matter is defined by the notion that it is really the product of movement in space.

Generative principles as organizational systems are recognized as the basis for this work. Simultaneous continuities are observed to affirm the continuity of space and light.

**Conceptual association** speaks of a capacity to accept different but supportive interpretations within a set of agreements and a system of relationships. For an intervention to be a vehicle for meaning and significance, it must allow a range of individual as well as collective interpretations; e.g. individual not in terms of size but rather in terms of being more specific to a person and collective in terms of a group image based on shared experiences. The experience of a place is defined by the pattern of sensations which make up its meaning and which affect our immediate well being.
Identifiable character is the result of a qualitative interaction between observer and observed.

**Behavioral Principles** (Organization systems), as generative principles, discuss ways of describing a spatial connection with a larger existing system. They are qualities of physical form and spatial territory and support particular meanings and range of uses. Behavioral Principles such as Continuity, Territory, and Stability are not dependent on particular attributes of elements or specifics but rather depend on our perception of how they affect us. These are explicit concepts which define the basis for our experience of space and light.

**Continuity** is an affirmation of space and light as positive conditions of the physical world. The world of architecture assumes that space and light and their continuities are more dominant than its discontinuities.
Territory is the spatial result of physical definition. It is the spatial interaction between elements. The demarcation that results from the interaction between a closure line and the location of adjacent columns which are not colinear with the closure line summarizes the concept of double-sided. The association of Outside is provided by what is beyond the closure and it is perceived as continuous light, the closure line is the solid which defines the Inside in reference to the Outside. Inside is perceived as enclosed light. The concept of double-sided is the recognition of light (continuous), solid, light (enclosed). In contrast to the notion of reference is a concept of one-sidedness, where only one side of the reference is acknowledged.

Our understanding, in diagram form, evolves from:

Paul Klee diagram, Physical Demarcation as spatial zone...
Spatial Transformation

from:

- Light inside, protected.
- Continuity of Material, Solid
- Light outside, unprotected

with:

- Continuity of Material, Solid
- Material is dominant recognition

Medieval Village,
Central Organization

a. Continuity of light, double-sided
b. Light (space) dominating.
Territorial association begins with the basic recognition of Light, Solid, and Light. In the built environment, the association of Territorial Continuity is achieved from the relative minor lateral displacement between demarcations. In contrast, the association of Territorial Privacy is achieved from larger lateral displacement which separate demarcations and support the discontinuity. In specific terms, the two descriptions refer to the difference between the association of agricultural stepping on a hillside and the association of a mezzanine whose vertical height is large enough to provide visual discontinuity from below. Agricultural Stepping is seen as the attempt to gain horizontal surfaces for use. The result of transforming the understanding of Territorial Continuity and Privacy yields an interaction between demarcations which provides for the association of each of the demarcations plus a territory gained from the relationships between them; a three dimensional continuity is achieved.
Spatial Attributes

Basic Association (Light, Solid, Light)
Two dimensional relationship.
Light zones represent continuity, e.g. most dominant element.

Territorial Continuity

Territorial Privacy

Agricultural Stepping

a. Double-sided demarcations, claiming associated territories through their horizontal extension.
b. Spatial understanding of element
Example

F. L. Wright, Falling Water Elevation

F. L. Wright, Falling Water Section

Light-Solid-Light

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**Stability** speaks of the capacity of any physical definition to define a three-dimensional territory without the assistance of additional elements. It speaks of an intrinsic quality that associates the understanding of “defined territory” as the three-dimensional transformation of the light and space continuities. Now space is as real to organize our spatial experience as mass was in the past when used to achieve protection from external forces.

The Concept of Stability is diagrammatically summarized as follows,

- **from:** Continuity of Solid
  - Center controlled (Cross)
- **through:** Continuity of Solid
  - Edge controlled
- **to:** Continuity of light
  - Space controlled
  - Horizontal Extension

*Continuity of Mass*
Closed form controlled by center.
Spatial Stability

Example

Through:

<table>
<thead>
<tr>
<th>Solid</th>
<th>Light</th>
</tr>
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</table>

Continuity of Solid
Edge Controlled

to:

<table>
<thead>
<tr>
<th>Solid</th>
<th>Light</th>
</tr>
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</table>

Continuity of light (space),
Horizontal extension

Tile Banding

Paul Klee diagram
Organizational System, as organizational relationships permits the selection and deployment of physical elements to support use intentions. Spatial structure is described as organizational relationships. These relationships respond to external forces in the context and internal forces, i.e., those related to the intrinsic nature of elements used. The spatial exchange of built and unbuilt elements generates the organizational system. The simultaneous layering, perception, and use of such organizational system are desirable attributes of any intervention.

Organizational systems at their basic level assume an "open" or "packed" state. A "packed" state is defined when every position possible, within a chosen frame of reference, is assumed built. An "open" state is defined as the opposite. Organizational systems are discussed in terms of movement (access), continuity of light, change and growth. Their basic attributes include notions of Singular, Serial
Juxtaposition, Central, External Access, Open Field relationships, and combinations of these.

A **Singular** relationship is best presented by the example of an open pavilion, in which there is no definition except for a sectional limit.

**Serial Juxtaposition** implies movement. The arrangement of parts in a sequence results in the lack of privacies, except for those achieved from agreements that are in themselves independent of the sequential order. The lack of privacies allows for a sequence to be public in its association. A Serial Juxtaposition organization achieves two qualitative conditions. First, it may result in the understanding of an implied direction, as in the case of the Early Christian Church. Second, it may result in circular movement about a central element, as early Colonial houses were organized about their heat source.

A **Central** Organization defines Space as Object. Privacies define the boundary between Space Inside and Space.
Outside (public). The Central relationships in a courthouse scheme provide for the movement between privacies and the open court in either a directional or in a circular sequence. The Central relationships in a traditional Christian church provide for directional movement crossing at the central element (Altar).

Another example of Central Control is the Gothic Cathedral in the medieval town, i.e. Central control as relief.

An **External Access** Organization provides for movement and privacies as separate experiences. In the previous attributes, movement supported the experience of privacies and their organization. This is no longer simultaneous.

An **Open Field** Organization provides for two groups of relationships, those between each privacy and movement, and those relationships among the privacies. The relationship between privacies and movement defines the relative qualities of public and private which depends upon the privacies orientation with respect to the public direction of
movement. The relationships among the privacies reinforces movement as potentially a continuous spatial experience. **Combinations** of all these attributes are deployed to support use intentions particular to the design exploration.
Organization System Attributes

Singular, Open Pavilion

Serial Juxtaposition, Directional

Serial Juxtaposition, Circular
Organization System Attributes

External Access

Open Field
Organization System Examples

External Access Organization:
External Stair and Serial juxtaposition of galleries and private offices

Central Organization:
Central Steps are the Collective territory
The **physical vocabulary** relates to the character of the elements used to achieve the conceptual association. Concepts of control, as attributes of organizational systems, are defined by the following notion:

**Alternation** is composed of two basic ideas. First, the notion of a choice. In the physical world, this is acknowledged primarily through the recognition of Light and Dark, Left and Right, or Large and Small.

Second, Alternation is about the territorial exchange between two ongoing systems. In the physical world, this is understood through the recognition of relationships between elements such as concepts of Registration, Displacement, and Dimensional Self-Stabilities.

 Alternation exemplifies the simplest form of spatial stability. Stability, in this work, is defined as the basic way to define a territory.

"...Every physical form, every living form, every pattern of feeling or thought has its own unique identity, its boundaries, its extension and its wider context; it contains or is contained by another pattern; it follows or is followed by another pattern. The unique identity, discrete shape, and nature of a space-occupying substance are shaped by the boundary that separates it from and connects it to the space outside...In the same way the physical, biological, or moral individuality of man is the function of his active relationship with the physical and social environment."

-Gyorgy Kepes
Light-Dark, Left-Right, and Large-Small define the first possibility for choice, a yes or no condition. The repetition of this association is the simplest way to induce the perception of space.

The Concept of Registration provides for the recognition of elements in relation to a territory. This defines the orientation of their association in space. Registration provides for an intensification of a territory.

Displacement, in general terms, is described in terms of Translation and Directional Registration. Translations involves the notion of distance from a frame of reference and its rotation. Directional Registration involves the notion of positional conformance and dimensional registration. In more direct terms, Displacement speaks of the claiming of the territory associated with a demarcation. The claiming of the territory is quantified through the extension of the demarcation to define both sides of its norm.
Concept of Control: Alternation

Light and Dark Alternations

Left and Right Alternations
Hans Schindler, Lobell House Section

Large and Small Alternation

Left and Right Alternation

Large and Small Alternation
Concept of Control: Alternation

Paved Street

Hans Scharoun, Geschwister School, Lunen, Germany

F. L. Wright, Taliesen West

Registration

Registration

Registration
Concept of Control: Alternation

Paul Klee diagram, Displacement

Displacement as Translation and Rotation

Displacement with Directional Registration
Dimensional self-stability speaks of intrinsic dimensional attributes associated with specific elements and their relationship to other elements as reinforced by dimensional rules and systems of deployment.
Concept of Control: Alternation

Maurice Smith Diagram of Malevich’s Red Square

Maurice Smith Diagram, Malevich

Dimensional Self-Stability

Plaza del Domo, Italy

Maurice Smith Diagram of Piazza del Domo

Dimensional Self-Stability
The **process of building** articulates the nature of the assemblage and its elements. Each element with its own process can support the generation of a spatial territory. By exploring the intrinsic nature of things, its new use as generative principles can be applied within a new conceptual framework. The goal is to generate responsive environments as positive extensions of the existing order of the context in pursuit of new shared meaning and agreement.

The intrinsic nature of elements is based on the notion of Self-Stability. This is dependent on its physical properties which define territory without depending on any additional demarcations.

The physical properties of elements are organized into Form Families. The List of elements is as follows:

**Single-sided surface**

Habitation is always limited to one side, for example "above it" or "below it".

e.g. ground plane

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*Single-Sided Surface by E. Saarinen, Kresge Auditorium*
Two-sided surface
Habitation occurs on both sides of the surface
e.g. Falling Water Planar demarcations.

Surface tension form
Complete single-sided surface. The range of
surface tension forms includes from the
organic world to geometric and crystalline
forms.

Planar Demarcation
Two dimensional Demarcation whose physical
property may be that of a double-sided or single-
sided surface. Demarcation that defines the
association of Light, Solid, and Light.
**Skeletal or lineal frameworks**
Aggregation of point supports achieved from a self-stable system which defines a three dimensional territory without depending on additional or external physical definition. The degree of partial containment for the framework will depend on the relationships of the elements within the aggregation.

**Screen**
Light transformation system which depending on elements and numbers used supports the range of transformation from the blocking of light directly to a result with increasing light leading to openness.
Macintosh introduced the two Dimensional Screens as substitutes for the solid walls which had been the norm. Eye Level intensification
Screen, cont’d

within the light transformation is the first association of the ground plane as three dimensional space. Eye level intensification reinforces movement through space. A screen Light transformation using planar elements is summarized next.
Screen Light Transformation: Planar demarcations
Element: Screen

Two Dimensional Screen

Three Dimensional Screen, Eiffel Tower

Three Dimensional Screen, A. Gaudi, Sagrada Familia
Three Dimensional Screen:
Hans Scharoun, Berlin Philharmonic Hall Stairs
List of Spatial Quality:

**Partial containment**
First spatial quality which defines a three dimensional territory as the spatial result of physical form.
For *spherical demarcations*, which intrinsically have the capacity to contain, can be only recognized as a partial containment when it is incomplete. Its relationship to other elements will determine its nature as a single-sided or two-sided surface.
For *planar demarcations*, which only define a two dimensional spatial relationship and intrinsically cannot contain, a partial containment is achieved by constructing a demarcation with planar returns. Its final geometric construct is no longer planar (height and length) but defines the third dimension. The degree of partial containment is achieved by the size, number, and nature of returns provided.
Spatial Quality: Partial Containment

Paul Rudolph, Yale Center

Aldo Van Eyck, Partial Containment

C Caveri and E Ellis, Iglesia de Nuestra Sra. de Fatima, Buenos Aires (Argentina)
Addenda
Addendum A: Proposed Development
Addendum B : Recollections

...feels like a known place...very much at ease with the physical surroundings although they are quite different in its building elements from our daily experience. Curiosity and fine weather bring us to walk through the city, I smile constantly and continue to walk for my entire stay. Day by day, I begin to understand the city and its people. There is no limit to where we go but the understanding of the different parts of the city begins to unveil. As I walk, I begin to expect where the street cafes can be found for a quick refreshment. I sense where wet laundry is to be hung before I walk by it, I begin to understand where children will be playing before I hear their voices...feels like a known place...Walking is no longer a link between two points, it is beyond a right or left turn. It becomes a complete experience of a place. A place where one anticipates, where one is assured and confirmed. The busy streets set up the stage for the sand lots where children play, the places for afternoon walking and looking begin to explain the private corners of the city. One part is not separate from the others, but rather it is always experienced as part of the whole...a whole which is with
you...always understood.
I try to remember the reaction of other international INDESEM '88 participants visiting Split as I was. I remember their smiles, but I remember them lacking the enthusiasm for Split which I felt. Was Split taken for granted?.
What do I recall from Split...? People everywhere...not tourists as April was too early for the season, but residents of the City of Split everywhere. Walking, talking, sitting, looking...
I recall the sense of the place. A corner where good “burek” was found, a set of steps where one could sit and look, a large open area where the highest density of cafes where located. All different parts of the whole, all needed to understand the place called Split.
The experience of Split became the experience of a balance between individual identification and a collective understanding. Looking back, the overpowering experience of the Old City was one of identity and character...there is no other Split.

Split, Yugoalavia, April 1989
Addendum C: Dictionary

Behaviour (bi-hav-yer) n.
1. Demeaner
2. Action, reaction, or function under specified circumstances

Collection (k-lek’sh n) n.
1. The act or process of collecting.
2. A group of objects or works to be seen.
3. An accumulation

Collective (k-lek’tiv) adj.
1. Formed by collecting, assembled or accumulated into a whole.

Feeling (fe.ling) n.
1.c. A physical sensation, emotional, mental sensation

Form (fo( )rm)
1. a. The shape and structure of something as distinguished from its material.
Nature (nature) n.
2. The order, disposition, and essence of all entities composing the physical universe

Norm (norm) n.
1. A standard, model, or pattern regarded as typical for a specific group

Organization (organization) n.
1. The Act of organizing or the process of being organized.
2. The state or manner of being organized.
3. Something that has been organized or made into an ordered whole.
4. Something comprising elements with varied functions that contribute to the whole and to collective functions; an organism.

Principle (principle) n.
1. A basic truth, law or assumption or an organized explanation
Spatial (spaˈʃi əl) adj.
Of pertaining to, involving, or having the nature of space

Structure (struˈkch ər) n.
1. A complex entity.
2. a. The configuration of elements, parts, or constituents in such an entity; organization; arrangement.
2. b. Constitution; make-up.
3. The interrelation of parts or the principle of organization for a complex entity.
4. Relatively intricate or extensive organization.
5. Something constructed, especially a building or part.

Space (spās) n.
1.a. A set of elements or points satisfying specified geometric postulates: non-euclidean space.
1.b. The intuitive three-dimensional field of everyday experience.
1.c. The infinitive extension of the three-dimensional field.
**Whole** (hol) n.

1. All of the components, parts or elements of a thing.
2. Complete entity or system.
Addendum C: Process of Conceptualizing

Alvar Aalto, Library in Viipuri, Finland: Conceptual thoughts Analysis
TOWN HALL IN SAYNATSALO

Alvar Aalto, Town Hall in Saynatsalo, Finland: Conceptual Thoughts Analysis
Boston Public Library, Original Building: Conceptual Thoughts Analysis
Hans Scharoun, Library in Berlin, Germany: Conceptual Thoughts Analysis
Addendum F: Spatial Structure Exploration Prototype

N. C. Habraken, Competition for a Town Hall for the City of Amsterdam, Holland

Site Context  Structural Grid  Deployment of Load bearing Walls

Deployment of Collective Elements
Reference, Christian Church within the city's tissue
Afterword

At this point, some conclusions may be drawn. . .
The process of referring to the experience of the physical
world as a basis for projection is very rewarding. The context
in which my discovery has occurred is defined by what has
been said repeatedly throughout this work on the value of
concepts of spatial content. The construction of space as
experience is that which we all share.

This work has taken shape as an exercise to raise questions, it
is not an end but the beginning of the search for answers.
Time constraints and the decision to consider the large scale
design exploration assured the fact that I could not reach
with this exploration issues of materials, notions of institutions,
and in general issues associated with programmatic content.
This work continues. . .

Although, Institutionally it is the end, I only begin. . .
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