

USER MEDIATED FORMAL CONTENT:  
A BASIS FOR THE GENESIS OF FORM

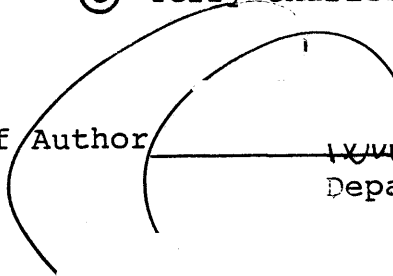
by

Terry Charles Hargrave  
Bachelor of Architectural Engineering  
Washington State University  
1965

Submitted in Partial Fulfillment of  
the Requirements for the  
Degree of  
MASTER OF ARCHITECTURE IN ADVANCED STUDIES  
at the  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
June, 1978

© Terry Charles Hargrave 1978

Signature of Author



Department of Architecture May 1978

Certified by

Wayne V. Andersen, Ph.D., Professor of the History of Art

Accepted by

Julian Beinart, M.C.P., M. Arch., Professor of Architecture  
Chairperson, Departmental Committee for Graduate Students

MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY

AUG 10 1978

LIBRARIES

# Index

---

Title Page.....	1
Index.....	2
Abstract.....	4
Methodology.....	6
Introduction.....	9

## **1.** THEORIES IN PRACTICE 12

---

Theories & Roles.....	13
As Technician.....	15
As Manager of Commerce.....	18
As Politician.....	22
As Artist.....	24

## **2.** HUMANS IN THEIR ENVIRONMENTS 28

---

Needs, Desires & Intellect.....	29
Dimensions of Individuals.....	35
Social Dimensions.....	43
Behavior in Environment.....	45

## **3.** THE LANGUAGE OF FORMS 49

---

Cuing & Symbols: Content: Meaning.....	50
Form and Content.....	63

## **4.** DIMENSIONS OF CONTENT 67

---

Materials: Mass.....	71
Space.....	74
Shared Characteristics.....	78
Content: Summary.....	80
Ordering Content.....	82

<b>5.</b> CONCLUSION	94
<hr/>	
<b>6.</b> APPENDICES	102
<hr/>	
A: Studio Problem.....	103
B: Semantic-Differential.....	117
BIBLIOGRAPHY	118
<hr/>	

"Special Thanks" to:

Cynthia, who made it happen.

Lisa, who allowed it to happen.

Wayne, who shaped it.

Spence, who started it.

Greg, who encouraged it.

Kevin and Julian and Al who will change it.

Myself ,for doing it.

## ABSTRACT

USER MEDIATED FORMAL CONTENT:

A BASIS FOR THE GENESIS OF FORM

BY TERRY C. HARGRAVE

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE MAY 1978 IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER  
OF ARCHITECTURE IN ADVANCED STUDIES.

This is a study of relationships between human activities and the places with which they are attached.

The study examines the developing theories of: personal and social behavior in context with environmental settings (form); the languages of settings and artifacts that communicate their uses or purposes as places or objects for human activities or human attachments; relationships of these theories to the practice of architecture as an art; and a case study of a design studio problem reflective of these theories.

The study observes certain attributes of the theories which are suggestive of a unified construct from which all relationships can be considered. Additionally, the study advances connections between these theories and traditional aspects (principles and elements) of architecture.

The underlying objective of the study is to formulate a personal theory for the genesis of form.

Thesis Supervisor:

Wayne V. Andersen, Ph.D.

Title:

Professor of the History of Art

"Words no longer seemed of use  
Old ways of thinking left behind  
Images clear as sunlit dew  
Flowing freely through my mind  
Being as the image formed  
Without space and time between.

Looking back it seemed a dream  
Only now was real to me  
The depth and feeling of its force  
Moving me beyond myself."

Hugh Prather

I Touch The Earth, The Earth Touches Me  
(New York: Doubleday & Co., 1972)n.p.

# Methodology

---

Theories of art, architecture, sociology, psychology, and linguistics remain only partly verifiable by direct observation. This study touches each of these disciplines. It brings together concepts of human perceptions of their world, the meaning of those perceptions as expressed in their activities, and the design of places to reinforce certain meanings. It is tempting to fully explore every related theory to each of these concepts, in an effort to make connections between them and to expand each concept. However, if all are pursued, the thrust will be lost in an "ocean of anomalies"<sup>1</sup>. The study focuses on general issues that explore the hypothesis; conclusions are based on evidence from theories as well as verifiable research.

It is my intention to incite inquiry into the links between people and their environment, although the study is subject to the interpretations of the various disciplines and theories it embraces.

1. I. Lakatos, "Criticism and Methodology of Scientific Research Program", in Criticism and the Growth of Knowledge ed. Lakatos and Musgrave (n.p.:n.d.)

The methodology of this study can be summarized by a quote from Stan Anderson (format edited)<sup>2</sup>:

"We do not ever know.  
    We guess.....  
Often we learn.....  
    we must abandon  
Reform that guess....  
    we must criticize.  
Search.....our mistakes."

2. Stanford Anderson, "Architecture and Tradition That Isn't Traditional" in The History, Theory and Criticism of Architecture, ed. Whiffen, Cambridge: MIT Press, 1970. P. 70.

# Introduction

---

This work is about the nature of environmental form and our participation in its genesis. The issues which give rise to this study are rooted primarily in the nature of environment and human interactions with it, and secondarily in its design. These issues are the unanswered questions, they suggest the developing theories. When do relationships exist between humans and environments and artifacts? Do we mentally structure and assign meanings to them? What in environments cue perceptions? How do meanings affect our activities? Where can we observe links between activities, perceptions, and the form which illicit or reinforces them? How do societal rules, world views, personal constructs, and values influence perceptions of the way we use form and the processes used for its design? In summary, how do environments suggest their usage, and how can we manipulate environments to reflect our purposes?

This suggests a variety of disciplines, many of which are only tangentially connected to architecture. In sorting through the potpourri of research and theories that touch these issues, it is clear that seemingly unrelated aspects share commonalities. It is from them that linkages can be

made to present a more or less unified point of view.

The need for a unified point of view is not trivial. Such a view allows the structuring, the reinforcement or falsification, of the multitude of conceptual paradigms which it addresses. The pitfalls of seeking a unified view are numerous: linkages may be presumed where none exist, theories used as evidence may be false, and the author's own world-view preconceptions may suggest unintended meanings from work outside of their own expertise. No single, all-embracing thesis underlies the whole of the work. It is unlikely in fact, that this is possible, due to the complexity and adaptability of people, and the diverse world-views from which form designers operate.

The first chapter explores the roles of designers and their form theories. Stances of architects as politicians, technicians, and managers of commerce are essential in the operation of the profession; however, the role as an artist remains unrealized -- especially as a social issue solicitor and meaning predictor. Although theories in use are minor themes of the study, the role-as-artist is directly related to the "form and content" argument of the study.

The development of a structure of the relationship between environments and humans is initiated in the second chapter.

The nature of human responses to their settings and artifacts, provides an obvious entry to the construct. These responses result from meanings mediated by perceptions of the cues provided in settings. The second portion of the construct, developed in the third chapter, is an investigation into the language of cuing and its relationship to form, settings, and artifacts.

The theoretical language of form is converted into working tools for designers in the fourth chapter. These tools, or dimensions of formal content, are seen to be order, articulation, space, shape, mass, focus, material, color, and so forth. These formal dimensions are also social and individual dimensions, in a cause and effect relationship. It is from this relationship and implications of a studio problem analysis, that the rudiments of a design process can be observed. The process involves the identification of essential issues or purposes of the people involved -- and based on those issues, the embodying of formal content in form.

Like any design theory, there are numerous issues left unaddressed. Most notable are issues of energy, ecology, and user involvement. The structure anticipates the expansion into these areas, as their inclusion is essential to make it operational. Additionally, I anticipate that

the meaning of certain terms will not be shared by all readers, muddling the theory even further. My understanding of the key words is as follows:

Content (noun): 1. Cuing power of environments or form; exists semi-independently of physical form; gestaltically perceived by humans. 2. Semantic power of form; a signal, sign, or symbol. 3. Also termed Formal Content.

Design (noun): 1. A plan or scheme conceived in the mind and intended for subsequent execution; the preliminary conception of an idea that is to be carried into effect by action. 2. Contrivance in accordance with a preconceived plan, pre-arranged purpose.

Environmental Setting (noun): 1. The physical world in which human activities occur. 2. Form.

Form (noun): 1. All perceivable aspects of the physical setting; physical combinations of mass, shape, color, space and so on. 2. Artifact or environmental setting.

Formal Content: The content of form, or formal syntax.

Formal Structure: The relationships of the components of form -- content, physical form, and their order.

Meaning (noun): 1. Perceived - personal interpretation or mediation of messages, especially as perceived from formal content. 2. Intended - that which is meant, especially the purpose of the formulator of formal content.

1.

**THEORIES  
IN  
PRACTICE**

## Theories & Roles

---

"The architect has ceased to determine, except in the most superficial aspects, the form of buildings, and has become a mere technician in the service of his corporate and governmental masters. Ironically enough, this has come about because corporate and governmental clients have become convinced of what was a doctrine of the Modern Movement --- that architecture must be a wholly rational, technical exercise."

Arthur Kutcher

The New Jerusalem Planning  
and Politics

Cambridge: MIT Press, 1975.

---

The majority of practitioners do not operate on the basis of espoused form and design theories. It is rather impossible to report their views in more than a speculative manner. Explicit theories on form are rarely expressed. The issues which are of value to those involved give us a means for comparing their intentions with those of others. If we presume that those intentions are made manifest in form, we can suggest the rudiments of their formal theory on the basis of their intentions.

It is evident that every design decision has a variety of generically different variables, or issues believed to be relevant, both dependent and independent of each other. The nature of committing architecture is characterized by continuous decision making: what criteria is to be considered? to what extent should criteria bear on product? what compromises? who should be involved? is form inevitable, or simply strategy? It can be assumed that one's architectural, political, and social values inform which issues are solicited through the process of actions as one engages the design of form. From these assumptions, an equivalency is suggested between formal theories and role perception, or:

FORM THEORY ~ ROLE ~ ISSUES PURSUED.

## As Technician

---

"The Modernist Movement was founded on the principle, explicitly, that efficient form is beautiful and harmonious."

Alexander Tzonis<sup>1</sup>

---

Most practitioners operate in a rational and technical manner. Rationality has been philosophically equated to esthetic beauty -- the espoused theory of the Modern Movement. From the above issues (intentions, motives, questions, values) there is an underlying operational basis, or role: that of a technician. The quote from Arthur Kutcher at the beginning of the chapter, suggests that the Modern Movement "doctrine" has perpetuated the on going role of architect as a technician (an inventor, a coordinator of standards, functional aspects, working in a cooperative manner with other technicians).

1. Alexander Tzonis Towards A Non-Oppressive Architecture  
Boston: i Press, 1972. P. 82.

The doctrine underlies not only the formal theories, intentions, but is adapted to methods in which problems are "solved", to the architect-client relationship, and the design-construction process it self. Architects solve problems by proposing buildings -- buildings based on notions prescribed or described by their clients. Ready-made solutions, "standards", even entire buildings offer "solutions". However, ready-made solutions do not address issues of the varying contexts (cultural, environmental, and legal) that exist between projects. Obviously, this is an over-simplification of a diverse and changing industry, but serves to illustrate a summary glance of prevailing practices.

Prior to the Modern Movement, the traditions of its predecessors were instrumental in the way designers attached themselves to their roles. The design task often consisted of selecting and modifying buildings types and styles, usually within a society bound to its traditions. The Modern Movement generated new role which generated changing theories. The evolving design task expanded the need for conscious involvement. Every new problem brought its own structural, functional, and intellectual implications.<sup>2</sup>

2. Walter Gropius, The New Architecture and the Bauhaus Cambridge: MIT Press, 1965.

The role was changing from "improver" to "inventor". The search for appropriateness of visual style, which characterized preceding periods, became the search for functional style with its own esthetic. We can summarize the issues which were pursued as a part of the movement:

1. The intent to change the role of architect from improver, selector, to inventor.
2. The intent to standardize construction in order to reduce building costs.
3. The intent to expand the quantity of space as costs decreased, due to standardization.
4. The intent to be rational, to examine the "nature" of materials, construction techniques, and technology.
5. To assume beauty as equivalent to the functional and the rational.
6. The intent for cooperation among team members rather than the architect as a "star" with followers.
7. To view the architect as coordinator, unifying formal, technical, social and economic problems.

## **As Manager of Commerce**

---

---

The practice of architecture services clients, users, and the construction industry. Clients, who pay for these services, are typically concerned with optimizing their purchase. Their desire to optimize spending demands that architects offer predictable results. This has evolved into an institutional problem solving process reflective of a buying-of-services strategy.

The process is essentially a linear one: words are used to express client/user requirements (programming); diagrams are employed to develop relationships between these requirements (schematic design or planning); drawings are provided to develop building space to accommodate these requirements (Design Development). The standard form of agreement (Contract) between the architect and their client defines

these linear phases of the process, and provides compensation to the architect as each phase is completed<sup>1</sup>. This linear problem solving process is rather easily learned and operationalized, especially if variables are assumed to be determinant and independent. Rather than learning problem solving (cyclical conjecture and refutation, yielding the most "correct" solution) , Ben Wade speculates that architects learn and employ prescriptive methods for solving problems in order to carry out this linear process.<sup>2</sup>

It might be argued that the process of problem solving during the Modern Movement was cyclical to some extent; however, the relationships between architects, clients, and the industry imposed restraints to such a cyclical process, as they still do.

The dilemma of the process -- what tends to abbreviate it, or truncate it -- is the contracted need to "fix" the solution at an early stage, a result most often of the architect and owner fee agreement, which conflicts with the flow of fresh insights, new information or simply new whims of the designers.

1. Agreement Between Owner and Architect. Form B141. American Institute of Architects, 1973 edition.
2. Ben Wade, Architecture, Problems and Purposes. New York: Wiley and Sons, 1977.

Owners (who are often developers) and architects accrue financial gains if the solution is quickly reached, fixed, and constructed. <sup>3</sup> The need to maximize profits by limiting time requires the architect to be not only an efficient technician, but also a manager of the commerce of money and commodities. In this mode of operation, the underlying values and the issues solicited are:

1. The technical and the rational "coping" with the system as a view of their role.
2. That time money: efficiency in making decisions creates a desire to decrease variables; systematic approaches are desirable; manage money rather than processes; prescribable processes.
3. "Design" as a saleable commodity, a means to an end (money); the need to maximize the "visibility" of the product in order to increase profit.
4. The need to influence such political decisions as can order to procure project design roles, thereby increasing profits.

3. The monetary advantage accrues from the lessening of inflation costs if construction commences at an earlier date. Advantages to architects are both monetary and opportunity. With fixed fee projects, the elimination of "wheel spinning" time is money earned; opportunity advantages also occur when fees are also based on hourly costs with a set maximum and on a fee plus cost (shortening project time creates more fees because of more projects, whereas costs are reimbursed).

5. Mistakes are costly, thus the need to minimize accountability, to minimize involvement to the "essentials".<sup>4</sup>

4. Case and Company research for the A.I.A. indicates that architects continue to incur losses on one-third of all projects in spite of profit motives.

## As Politician

---

"A painter can paint square wheels on a cannon to express the futility of war. But an architect must use round wheels."

Louis Kahn, 1973<sup>1</sup>

---

Kahn must not have noticed that the social unrest of the sixties inspired young designers (who were busy refuting the "round wheel" syndrome) to redefine their conditioned social roles. The most "noble" but perhaps the most absent in the profession, is that of the architect who seriously believes that social and political changes are necessary and commits their energy to effect them. There are no cash incentives for this position unless payments are received from society at large. Less noble, but with economic potential, is the role of the architect who gains power from political involvement and transfers that power into the process of soliciting new projects. And of course,

1. Louis Kahn, The Notebooks and Drawings of Louis I. Kahn Cambridge: MIT Press, 1973. n.p.

there is the client advocate architect whose gain is related to the gains of the client.

The range of concerns, which are engaged by policy formulators, extend from national policies for land use to the height of stair risers. Architects with political power can offer solutions with a higher probability of acceptance to those agencies which are under political restraints. Thus, the need to explore a variety of alternative solutions -- needed to optimize the needs of society at large -- are decreased. There are limitless ways for the architect to play the politician role, and are related to their intentions and motivations. Why is power being sought (to help others, increase one's income)? Who ultimately pays for the service (society at large, yourself)?

# As Artist

---

"The discoveries of science, the works of art, are explorations - more, are explosions, of a hidden likeness. The discoverer or the artist presents in them two aspects of nature and fuses them into one. This is the act of creation, in which an original thought is born, and it is the same act in original science and original art."

J. Bronowski<sup>1</sup>

---

The term "artist" conotes varied meaning. To establish a mutually shared understanding between myself and the reader, I am borrowing a general definition from Susanne Langer: "Art is the creation of forms symbolic of human feeling."<sup>2</sup> Human feeling is equivalent to the social, behavioral and cultural issues of society. We can assume that the architect-as-artist creates form and its content from the behavioral, and cultural issues of society. In this case the meaning of being an "artist" is related to the "welfare" of society (users, clients, and so on); or in a role with social responsibility. The key concept is not artist, social accountability or actions, but "welfare". To simply define welfare as group betterment

1. J. Bronowski, Science and Human Values  
New York: Harper and Row Publisher, 1956.  
p. 19
2. Susanne Langer, Feeling and Form  
New York: Scribner, 1953. p. 40.

or well-being is insufficient -- who ascertains a group's well-being? the group itself? a professional well-being evaluator? There is no simple answer, but we can safely assume that the size of the group will affect the "who!" I might be able to discern my own health, but the complexity of variables increases when I engage my family, much more so with neighborhood or city.

Collectively used environments pose the greatest challenge to designers. Even if the "needs" of one-thousand people were made explicit, what democratic process allows solutions to every need? to collective needs? the collective needs of the majority? minority collective needs? Can one-thousand people be "educated" to "know" their own needs and make them explicitly known to representatives or even to the collective group? Should users be the intuitive designers of their own places, as only they "know" their own thoughts and feelings? If collective decisions can be made, how do they affect those who disagree? How do they affect the common resources shared by yet another group?

Artist's can operate intuitively to seek essential issues of human experiences. Generally, their ideas can remain their own, or if someone wishes to share them, they can, by observing the artist's works. Architects work for others.

The complex problems which architects confront have a multitude of data and issues attached to them. The process used to engage this complexity must be shared with society. Essential issues must be sorted from lesser ones.<sup>3</sup> A hierarchy is essential to the process of ordering complex information. Computers, artificial intelligence and matrices are of help in storing information but cannot exercise judgement which is essential to problem solving. Judgement is both evaluative and expressive: expressive of one's thoughts and feelings of the situation; and evaluative of the issues and data involved. If art is the creation of forms symbolic of human feeling, its creation involves expression and evaluation --- or the ordering and judgement process needed to solve architectural problems.

The politician engages the interests and issues of the people (the spectators, or the players); the artist transforms these issues into symbolic form (formal content); the artist-as-politician distorts formal content within contexts of the problem; the politician-as-artist-as-technician-as-manager transforms these distortions into physical form.

3. Lisa Peattie, From lecture notes at the Massachusetts Institute of Technology. Cambridge. 1976.

This does not suggest roles for three different persons, but rather multi-dimensions for a single entity or team. Sequential role enactment by separate persons can only perpetuate the on-going filtering process of program → plan → apply esthetics → build. This filtering process results from the passing on of feelings and thoughts by the separate persons involved, creating actions more of a coping rather than an expressive nature. It is essential in unifying the sentiments in physical form.

This suggests a unified mode of actions, which combines politician, manager, artist, and technician, and elevates the role of artist from "esthetics applicator" to synergizer of culture and social issues with their resulting symbolic formal orderings, form.<sup>4</sup>

4. An example of esthetic application is the commonly accepted "art" of applying an exterior to a plan concept. This is the work of the office "designer". This is the traditional role for architect-as-artist: the form giver, the arbitrator of "scale", the definer of shape, the selector of colors and materials, the one who ties it all together and make it look "right".

2.

**HUMANS  
IN THEIR  
ENVIRONMENTS**

# Needs, Desires & Intellect

---

"We have, each of us, an essential biological based inner nature, which is to some degree 'natural', intrinsic, given, and in a certain limited sense, unchangeable or at least, unchanging. Each person's inner nature is in part unique to and in part species-wide. It is possible to study this inner nature to discover what it is like."

Abraham Maslow, 1964<sup>1</sup>

---

Environmental settings do not determine human responses, however they can limit their range. And in some cases can initiate response. Most people are not aware of the complexities of this relationship or the effect it can have on their activities. The demand to consider and differentiate between the wants, desires, and needs of users of places or artifacts has been supported by contemporary critics and by social scientists.

The most obvious course of action for designers is to ask the question, "What are your needs?" But, the needs and desires of people tend to be complicated by several factors,

1. Abraham Maslow, Toward A Psychology of Being  
New York: Van Nostrum, 1964.

many hidden in the subconscious:

1. If we examine desires, we find that they are usually means to an end rather than an end to themselves. (Maslow)
2. Behind the expressed desires there are more fundamental unconscious aims (motivations), which are usually reachable only with professional counseling. (Maslow)
3. Behavior patterns are collections of multiple needs and desires, and are multimotivated. (Maslow)
4. The self expression of wants can be selfish (at the expense of others), ignorant, (without knowledge of self and others), wholly self-regarding, instinctive and conflicting. Wants are often the only means by which people can express their needs.
5. Nearly all environments or artifacts engage a multitude of users, rarely is a place designed for a particular person.
6. People are rarely aware of alternatives to certain desires which they have been conditioned to believe they want.

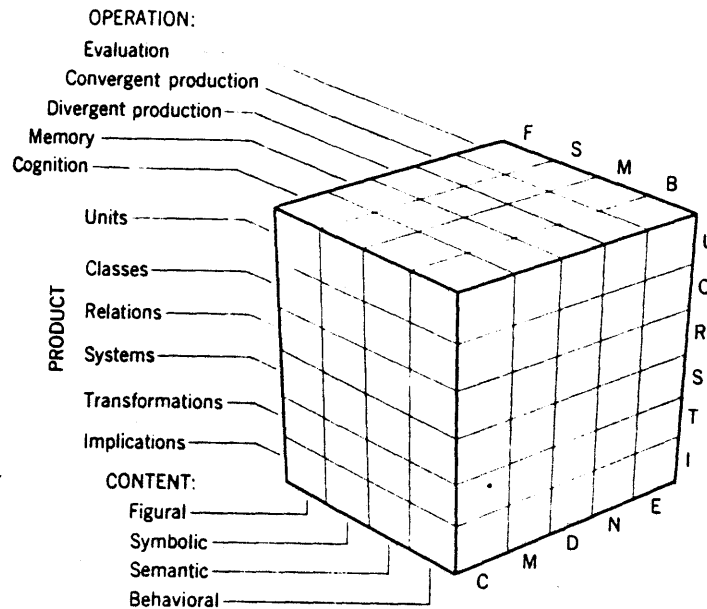
From these variables, it would seem to be an impossible task to ascertain with certainty the true needs of users of environments. Perhaps it is impossible. However, there are emerging methodologies, such as observing the ways people: use space, alter space, travel through space,

relate to others in space, and so forth. These methods assume that people's inner motivations and sense of self, in conjunction with their perceptions and cognitions, will be expressed in the manner they behave alone or with others. These behavior patterns are shaped by a multitude of variables which underlie the expressed behaviors. Variables such each person's physical capabilities, societal agreements on what is acceptable, the multitude of spatial and other types of cuing devices (which are only partially understood), the lack of environmental alternatives, and one's existential personality -- all bear upon the way people perceive and use places.

Motivations, wants, and needs are products of the human intellect. The structure of intellect classifies intelligence into three fundamental categories: operations, products, and contents.<sup>2</sup> Operations are the ways people can think; contents are the kinds of materials they can think about; and products are the ways information gets organized, as units ("things"), classes of units, relations among units, and so on. These three categories can be expressed structurally as in the following model (after Guilford):<sup>3</sup>

2. A.J. Guilford, The Nature of Human Intelligence.  
New York: McGraw-Hill, 1967. p.62

3. A.J. Guilford, p.63.



The three parameters of the model include 120 interfaces of intellectual processes. Of the many that are involved whenever humans engage their environment, it is the content parameter that suggests form and the language of form. Products and operations reflect the mediation of content, from which meaning is formulated. The three parameters are defined thusly:<sup>4</sup>

### Operations

#### Cognition:

Awareness. Immediate discovery or rediscovery.  
Recognition of information in various forms.  
Comprehension or understanding.

#### Memory:

Retention or storage of information in the same form in which it was committed to storage.

#### Divergent Production:

Emphasis on variety and quality of output.

4. A.J. Guilford p. 64.

Operations (continued)

## Convergent Production:

Logical deductions, or compelling inferences.  
Production of a single, correct solution. The problem is rigorously structured and the range of suitable answers is narrow.

## Evaluation:

Critical judgement. Reaching a decision. Comparing.

Products

## Units:

Discriminated bits of information. A "thing". Usually does not imply any other product, although it may do so, whereas other products do imply more than one product.

## Classes:

Class membership of a set of units by reason of common properties.

## Relations:

Analogies, opposites, part-whole relationships, trends, seriation, etc.

## Systems:

Organization of items of information. Structure.

Content

## Figural:

Information in concrete form. Sensory. Perceived or recalled in the form of images.

## Symbolic:

Information in concrete form of signs, such as letters, numbers, musical notations, and other code elements. The elements have no significance in and of themselves.

## Semantic:

Information in the form of meanings (verbal or non-verbal).

## Behavioral:

Information involved in human interactions where awareness of attention, perceptions, thoughts, desires, feelings, moods, emotions, intentions, and actions of other persons and of ourselves is important. Social intelligence.

Content is organized by the way we think and is equivalent to the cuing power of the world about us. We can directly observe, pragmatically and intellectually, this aspect of our world. To explore the various aspects of the content category, we will first examine evidence and assumptions, including:

1. Behavioral information as it pertains to individuals and groups in their environments.
2. Semantic information as it pertains to environments.
3. Symbolic information: signs, images, and figurals.

## Dimensions of Individuals

There exists a widespread opinion that innate sentiments or "weak" needs are held by all, and that we strive to satisfy them. General sentiments are expressed in a variety of ways as a result of one's motivations and personality.

Individual behavior patterns, that are expressions of these needs, are observable and somewhat predictable for certain environmental settings, however we lack an adequate theory to make useful connections between broad issues such as these and environments. They are termed "essential striving sentiments" by Leighton.<sup>1</sup> Each of the following sentiment unites human tendencies, basic urges, affects, drives and instincts:

Physical security.

Sexual Satisfication.

The expression of hostility.

The expression of love.

The securing of love.

The securing of recognition.

The expression of spontaneity.

Orientation in terms of one's place in society and the places of thers.

The securing and maintaining of membership in a definite human group.

1. Alexander Leighton, My Name is Legion: Foundations for A Theory of Man in Relation to Culture. Basic Books, 1959 n.p.

(Continued)

A sense of belonging to a moral order and being right in what one does, being in and of a system of values.

A brief discussion of environment setting responses to each of these sentiments can be found in the work of Constance Perin<sup>2</sup>.

Abraham Maslow has constructed a model of basic human needs which reflects a belief that individuals satisfy low level needs, then seek higher levels, and culminate satisfaction in a state of self-actualization.<sup>3</sup> A brief listing which he describes as "holistic-dynamic", arranged in a semi-order of stages, follows:

1. The Physiological Needs:

Homeostasis (the body's automatic efforts to maintain normal blood state).

2. Safety Needs:

Security; stability; dependency; protection; freedom from fear, from anxiety and chaos; need for structure, order, law, strength in the protector, and so forth.

3. Belongingness and Love Needs:

Affectionate relations with people, place in group or family.

2. Constance Perin, With Man In Mind. Cambridge: MIT Press, 1970. pp. 122-126, 136-166.

3. Abraham Maslow, Motivation and Personality New York, Harper and Row, 1970.

(Continued)

4. The Esteem Needs:

Feeling of mastery and competence  
 desire for strength and achievement  
 desire for reputation and prestige  
 desire for independence and freedom  
 (this may not be universal)

5. The Need for Self-Actualization:

Being what one can be,  
 true to one's nature.

From the above discussion it might seem that one's motivation (purpose) is the determinant of behavior. However, motivation is only one of several classes of behavior.<sup>4</sup>

Behavior is determined by the situation (context) within an environment and an array of other psychological factors, including one's striving for fulfillment and self-expression.

The theory that human behavior is based on instinctual needs as put forth by Freud and McDougall, has given way to a view best expressed by Maslow as: "behavior or ability, cognition or affection need not also be innate, but may be learned, canalized or expressive."<sup>5</sup>

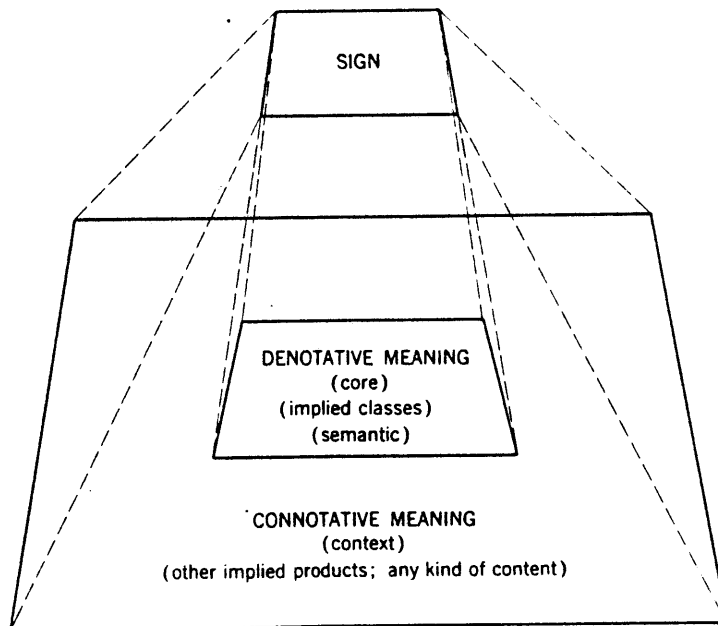
Maslow and Leighton assist in a general understanding of human behavior, but stop short in providing designers with a useful construct from which they can operate. However, their theories are instructive, in that they provide a view of the nature of human cognition, motivation, personal-

4. Abraham Maslow, op. cit.

5. Abraham Maslow, op. cit. p. 80.

-ity which is supportive of the concept that human behavior and activities are unique to each individual in spite of the underlying tendencies towards common behavior within groups.

Children are born with innate schemas, such as sucking, looking, listening and grasping. Having exercised a schema, the infant does the act over and over again, as if practicing it. The exercise has variations due to changes in environmental context, modifying normal practice. The sucking schema involves handling the bottle in different ways and substituting the thumb or blanket for the nipple. A concept develops with constant and essential aspects (denotative meaning) and variable aspects (connotative meaning). The diagrammatic relationship between sign, denotative meaning and connotative meaning is illustrated in Guilford's "core-context" modeling:



6. Guilford, op. cit.

Sensorimotor intelligence characterizes the first two years of our life, per Piaget.<sup>7</sup> At ages four to six intuitions develop, suggesting the products of implications. At ages seven to eleven their concrete operations appear, as we operate on classes of things and their relations (such as ranking of objects by size). Ages eleven to fifteen are characterized by the development of formal operations, logic separated from the context of space and time. This is the "average" adult level, which most individuals achieve.

Schemata, images, or inner representations are open to inspection and new realizations at any time, serving the function of endowing meaning to fresh input which cannot be experienced in isolation from what is already there.<sup>8</sup> The enormity of variables occurring in one's life makes it difficult to structure a direct one-step environmental stimulus equation in human behavior; mediating variables such as motivations, desires, and "schema" interfere with such a structure.

In spite of these mediating variables, we can examine a few direct links between individuals and environments, such as the way we navigate through environments. Space and objects cue our navigation processes. Space identifies the "whereness" of objects, providing a contextual meaning for that object,

7. Piaget, op. cit.

8. Lee, op. cit.

and provides cues for the potentials of its use.<sup>9</sup> Lee suggests that the "whatness" of objects and their "whereness" governs our behavior.<sup>10</sup> Navigation involves a more or less conscious deliberation including reasoning, hypothesizing, predicting, and carrying out the journey; modifying our actions step by step. Kelley postulates that each person evolves for themselves a personal construct (a theoretical structure) to guide them to anticipate future uncertainties.<sup>11</sup> Each considers the rewards of arriving at a goal (the "whatness" schema) and the costs involved in carrying out the task.

When the navigational course is unclear, one depends on behavior itself to revive more schemata as cues are advanced.<sup>12</sup> For most navigations, we merely refer to these schemata. In places that are shared with other people, standards are formulated, such as those for personal space.<sup>13</sup> Spatial and object schematas, like all others are structure which we organize for particular purposes or intentions. First we develop the body schemata, then we establish succeeding

9. Robert Sommers, Personal Space.  
New Jersey: Prentice-Hall, 1969.

10. Lee, op. cit. p. 2.

11. Kelley, op. cit.

12. Lee, op. cit.

13. Robert Sommer, Personal Space  
New Jersey: Prentice-Hall, 1969.

modified layers, which reflect the space we inhabit and the images we can select to plan our activities.

Individual behavior can be defined and analyzed as the level of the individual who experiences -- as well as behaves -- in the physical environment. At this level, inner experience in the form of perceptions, feelings, values, and underlying motivations assumes considerable influence both in evoking responses to the environment and in determining the meaning of it.<sup>14</sup>

However, the individual rarely lives in social isolation. Thus a second level of behavior can be formulated. On that level are found the characteristic patterns of behavior, values or standards that compromise the organized nature of group life. The distinction between a normative group behavior and non-normative individual behavior can be expressed then by observing the fallibility of presuming that a state of predictable human nature actually exists. The personal constructs of individuals are highly unique, dependent upon their motivations, personalities and view of anticipated events.<sup>15</sup>

14. Proshansky, Ittelson, Rivlin, Environmental Psychology. New York: Holt and Reinhart, 1970.

15. A good discussion of this point of view can be found in Maslow, op. cit.

Robert Bechtel and Roger Barker contend that theories of motivation, personality and instinct, do not assist in observing and analyzing "normal" behavior.<sup>16</sup> These theories are based on psycho-pathological needs (abnormal behavior), thus are related to individuals but inadequate as a theory of "normal" behavior for groups of individuals. Chomsky observes that an individuals' behaviors are too rich and too complex to be explained by stimulus-response patterns and that behavior can be modified through learning.<sup>17</sup> Bechtel also contends that "individual behavior does not matter", except for a custom designed private residence. The important aspect of individual behavior that does matter is the repetition of behaviors, thus a predictable patterning can be observed in context with a given environmental setting.

16. Robert Bechtel, From a lecture given at M.I.T., 23 March 1978.

17. Noam Chomsky, Aspects of the Theory of Syntax.  
Cambridge: MIT Press, 1965.

## Social Dimensions

---

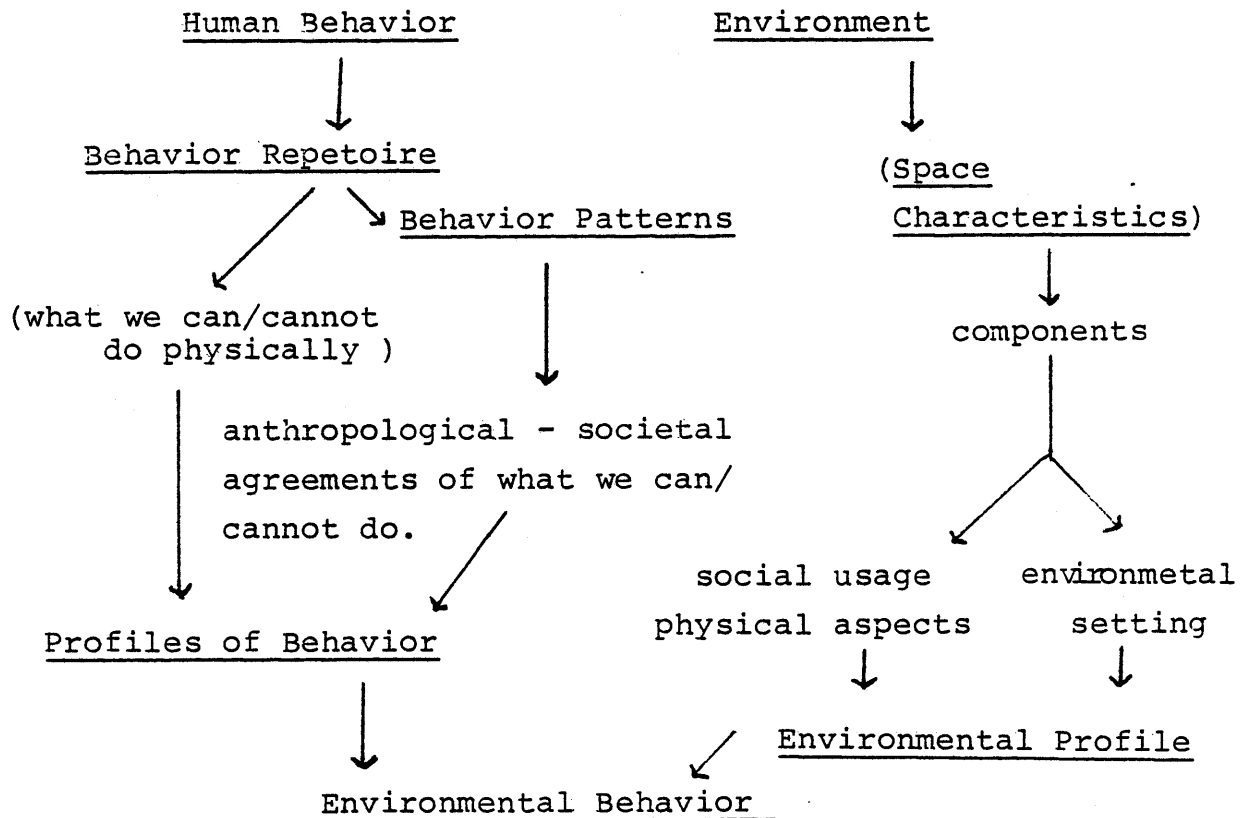
The dimensions which reflect our behavioral patterns as expressed by our relationships with others in environments, underlie the design of places which are shared by people. These reflect the individuals's inner needs and striving sentiments, but are more useful to designers because they can be readily ascertained through observation and general questioning rather than through "therapy-session". A few of the issues which give rise to the dimensions are:

1. Territoriality: the degree to which people extend their sense of personal territory, i.e. home range.
2. Privacy: the degree to which people respond to intrusions, the designation of one's self to others. An interpersonal boundary process, designed to pace and regulate interaction with others, can be categorized as solitude, intimate, anonomous, reserved.
3. Crowding: the degree to which people can live in proximity to one another without stress.
4. Stimulation, Arousal and Avoidance: the degree to which a person is aroused by an environment.
5. Adaptability: the degree to which people adjust to to their environmental setting.
6. Social Interaction: the degree to which people communicate.

7. Personal Space: perceived sense of envelope of space around one's self in context with other people, culturally conditioned related to privacy issues. Measureable distances can be categorized as Intimate, Social or Public.
8. Defensible Space: perceived sense of space which is controllable, dominated by one's self or group, to the exclusion of others.

# Behavior in Environments

Sandra Howell, from M.I.T., has developed a construct of behavior and environment which is useful in relating environmental settings and behavioral settings.<sup>1</sup> The essential aspects are:



1. Sandra Howell, From lecture series at M.I.T., Fall, 1976.

Underlying this construct are several assumptions that reflect both the personal constructs of individuals and group patterns. Proshansky, Ittelson and Rivlin developed the following classic framework:<sup>2</sup>

1. A setting is experienced as a unified field in which all senses participate (Gestalt view). The setting includes not only the physical aspects, but individuals and groups. They are cognized as a set of mental images.
2. Every component of the environment interacts or has defined relationships with every other component in two ways: (a) it acts on all other aspects, (b) it is acted upon by all other aspects and in particular, receives the consequences of its own action in terms of a changed environmental situation.
3. Changes in the characteristic behavior patterns of a physical setting can be induced by changing the physical, social, or administrative structures that define the setting.
4. Human behavior in reaction to a physical setting is dynamically organized, but is enduring and consistent over time, if all cultural aspects are equal.
5. Any given setting defines and structures the behavior of people experiencing it (from both its physical characteristics and its symbolic meaning).
6. A setting is perceived uniquely by an individual at any moment. Individual behavior reveals diversity over time.
7. The degree of influence that an environment has on behavior varies with the type of behavior, due to the cultural or anthropological context.

2. Proshansky, Ittelson and Rivlin: Environmental Psychology. New York: Holt and Reinhart, 1970.

(Continued)

8. If settings do not accomodate the characteristic behavioral patterns, then people seek other settings or alter their behavior.
9. Environments frequently operate at a level below that of our awareness. Environments are assumed, and not intellectualized by their users; that observed environments are not necessarily real environments.

Environmental settings, as the assemblage of physical parts and artifacts, offer parameters on social interaction and open certain possibilities and constrain others.<sup>3</sup>

This is the manner in which the physical world "speaks to" or cues, humans.

The response of people to these cues is determined by their perception of the meaning of these cues. The perception and ensuing behavior or response tends to vary from person to person -- a product of each person's construct. As Kevin Lynch noted, "The environment suggests distinctions and relations, and the observer - with great adaptability and in the light of his own purposes - selects, organizes and endows with meaning what he sees".<sup>4</sup> Furthermore, he suggests that there is a consistency of use and organization of these cues (from the external environmental setting) even though the perceived image (meaning) of a given reality (cue) may vary significantly between different observers.<sup>5</sup>

3. Don Preziosi, Cognition in Architecture. Unpub. 1975

4. Kevin Lynch, The Image of the City. Cambridge: MIT Press. 1960, p. 6.

5. Kevin Lynch, op. cit. p. 6.

Lee suggests that humans must learn two principal things about their environment: the value to themselves of different objects and the location of these objects.<sup>6</sup> Humans have a huge capacity for storing the residue of past sensations. This storage mechanism, learning and remembering, is not, however, just a static accumulation of bits of knowledge heaped up in order of arrivals, but is, to the contrary, a continuous sorting process in which fresh information is allocated to existing material of the same kind.

Piaget's theory of human development suggests that each individual uniquely stores information about different aspects of the environment and are organized within the central nervous system during the course of repeated actions, and perhaps after the completion of actions.<sup>7</sup> These function as a class of action sequences, a schema, a sensorimotor structure. Each schema is a product of information cognitively structured, changing over time as new experiences are engaged. This is a behavioral system.<sup>8</sup>

6. Terrance Lee, "Do We Need A Theory?", Architectural Psychology. Cambridge: W. Heffer & Sons, 1970. p. 18

7. J. Piaget, The Child's Conception of Space. London: Routledge and Kegan, 1956.

8. J. P. Guilford, op. cit.

3.

**THE  
LANGUAGE  
OF  
FORM**

## Cuing & Symbols : Content : Meaning

Meaning is a social phenomenon. In our challenge to survive we learn to recognize similarities and relationships --- pleasures and dangers -- of the forces, the phenomena, which involve our lives. We use our innate ability to abstract and generalize, or induce through cognition, the information of our world, for purposes of expanding our knowledge to operate successfully. What we momentarily induce from the continuous flow of information constitutes our existential meaning, the "here and now" dimension of time and place.<sup>1</sup> This implies, as has been previously shown, "that the meaning of any phenomena is (part of) the context in which it appears, and that any man is the interrelationships or meanings which are accessible to him".<sup>2</sup> Whereas human activities and behaviors are influenced by their environment, whereas this influence is perceived from the semiotics (cuing language) of that place -- there is a relationship between semiotics and behavior. Although semiotic images (content) are perceived from environments this does not mean that the environment has determined them;

1. For comprehensive discussion see: Nietzsche, The Will to Power.

2. Christian Norberg-Schultz Intentions in Architecture, op.cit.

nor does it mean that environments have irresistible powers to excite meaning<sup>3</sup>. Artifacts and environments may not be the direct cause of perceived meaning, but it does provide the sensory stimuli (content), which when perceived are synthesized in accordance with our own unique motivations, purposes and cultural context at that moment in time -- creating meaning.

There are numerous connotations of the word "meaning". Several disciplines deal with perception and language, each defining it to meet their own purpose. In linguistics, meaning is defined as the relation of signs to other signs as a messaging matrix, independent of social behavior and psychological process.<sup>4</sup> The definition suggests two concepts. One is sociological, based on: "the speaker utters it and the responses which it calls forth in the hearer". At the other end, a "purely linguistic" definition: "The meaning of a morpheme.....is by definition the set of conditional probabilities of its occurrence in context with all other morphemes."<sup>5</sup> Another linguistic definition lies within the structure of a language code, wherein the linguistic unit (morpheme) functions within the code system as a whole (or a sign related, to groups of signs)<sup>6</sup>.

3. Yi-Fu Tuan, Topophilia. New Jersey: Prentice Hall, 1974.

4. Charles Osgood The Measurement of Meaning  
Illinois: ILLINI Press, 1971. p. 2.

5. Charles Osgood, op. cit. p. 3.

6. Charles Osgood, op. cit. p. 3.

In philosophy, meaning is related to semantic content, the relation of signs to their significates. The philosopher seeks to state the logically necessary and sufficient conditions for signification.<sup>7</sup>

In psychology, "meaning" is defined much like it is in philosophy, however interest expands to the role of the human's behavior in mediating the relation between signs and significates. A sign is a pattern of stimulation; a significant is any stimulus which, in a given situation, regularly and reliably produces a predictable pattern of behavior. A general relationship suggests that a "meaning" which different individuals have for the same sign will vary to the extent that their behaviors towards the thing signified have varied. From this viewpoint, Osgood makes the following observations which are related to environmental behavior:<sup>8</sup>

1. Meanings of most primary perceptual signs should be quite constant for all individuals (e.g., the significance of the cues arising from an apple)<sup>9</sup>.
2. Meanings of verbal signs will be highly similar given the stability of a common culture (e.g., the word "exit").

7. Charles Osgood, op. cit. p. 4.

8. Charles Osgood, op. cit. p. 9.

9. The visual cues from "apple" have changed with the context of time and culture. A worm-hole once signified an unappetizing apple; but the advent of poisonous "worm killers" which also poison humans, create wormless apples which are now considered unappetizing by many who feel they will die by eating the wormless apple.

3. Meanings of many signs will reflect the idiosyncracies of individual experience (e.g., the meanings of "family", "love", "neighborhood", "sacred", "profane" and so on). It should be noted that variance in meaning is characteristic in multiple signing, wherein meaning is created by combining signs, which when re-arranged create variant meanings.

Osgood's methodology for measuring meaning is based on semantic differentials.<sup>10</sup> These are opposing adjectives which allows people to rank their reactions to a stimulus (such as a room) in a variable manner (such as from pleasing to unpleasing, arousing to relaxing, dominating to submitting). This methodology is useful not only for aesthetic judgements, but also for measurement of one's emotional state in a particular setting. (See Appendix B).<sup>11</sup>

The relationship of one's emotional state to an environment in the genesis of environments remains a paradoxical problem. Only if an environment exists, can people's responses be ascertained through the numerous methods available to researchers (such as the above mentioned semantic-differential, pattern-mapping, image-mapping, and so on).

10. Charles Osgood, op. cit. p. 327

11. Mehrabian and Russell, An Approach to Environmental Psychology. Cambridge: MIT Press, 1974

If an environment exists only in the abstract, it is rather impossible to predict with certainty, user behavior in response to the cuing of that environment, which in fact, does not exist.<sup>12</sup> To gain insight into prediction, it is essential to understand the nature of cuing. Cuing, signs, symbolics, or simply the language of environments are of two types: figural (denotative, signal) and symbolic (connotative, content dependent).

Figural signs (totemic and iconic) are in a specific format, perceived and recalled as images. Meanings are pre-assigned to that figure by prior cultural agreement. Their meaning is independent of their context, or their content = their meaning. Examples are "stop" signs, flags, and so on. Figural signs derive meaning by selective attention to aspects of the images they signify; symbols derive meaning by establishing a context within which interests and feelings become organized. Figural signs intend some part of the external world, and signify attributes of that domain. Symbols refer to occurrences in the domain of an internal world, and express what an organism has registered from experience and the valuations of that experience.<sup>13</sup>

12. The profession's responses to this dilemma is shown in Stanford Anderson's Planning for Diversity and Choice, op. cit. p. 5) They are: Prophetic and authoritarian -- assume that environments shaped by them will lead to the "good life" for users; Pragmatic -- can only deal with problems as they arise, so can't worry about the future; Nihilistic -- everything is relative, so anything goes; Universally flexible -- everything should be efficient, never abrasive.

13. Don Preziosi, op. cit. p. 155.

Symbolic signs derive their meaning in relationship with other variables, or are context dependent. Planning, without understanding contextual powers, can result in unintended meanings, such as: buildings with free standing signs at intersections suggest gasoline stations; and a sea of parked cars suggest a place for shopping. They derive meaning from association with other environmental cues and with their genesis: The Genesis Context, the relationship between forms and the general context in which they were generated (the Welanschauung of their period)<sup>14</sup>. Associative cuing is embodied in every environment. By associating past experiences we are able to (or learn to) negotiate and to comprehend our environment<sup>15</sup>. For example, a door knob cues the user as to its use. One associates its form, content, and usage, with previously experienced similar form. If it is a painting of a door knob, the user will not physically engage its usage, but its meaning still exists. Similarly, a certain shade of blueness may illicite a meaning of "skyness", or any one of dozens of other meanings, in a painting or an environment depending upon associative or iconic cuing. Blueness is the signifier, and "skyness" or any other meaning is the signified. This can be denoted as:

perceiver  $\begin{matrix} \leftarrow \\ \rightarrow \end{matrix}$  Signifier  $\rightleftharpoons$  blueness  $\begin{matrix} \leftarrow \\ \rightarrow \end{matrix}$  perceiver  
mediation  $\begin{matrix} \leftarrow \\ \rightarrow \end{matrix}$  Signified  $\rightleftharpoons$  skyness(or?)  $\begin{matrix} \leftarrow \\ \rightarrow \end{matrix}$  mediation

14. Luning Prak, The Language of Architecture  
New York: Mouton & Company, 1968.

15. Piaget, op. cit.

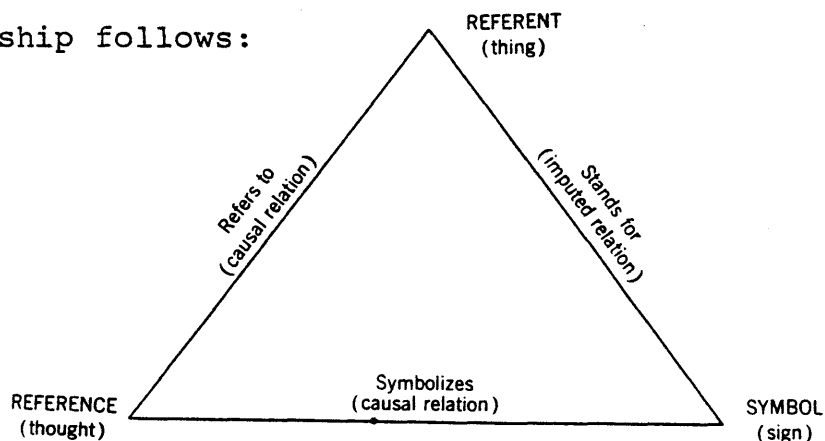
Similar notations are proposed by Burnham in structuring the relationship of form and content in art, on the basis of semantic constructs derived from Barthes:<sup>16</sup>

<u>signifier</u>	⌘	<u>(natural)</u>	⌘	<u>speech</u>	⌘	<u>image</u>	⌘	<u>form</u>
signified		(cultural)		language		concept		content (meaning)

Also:

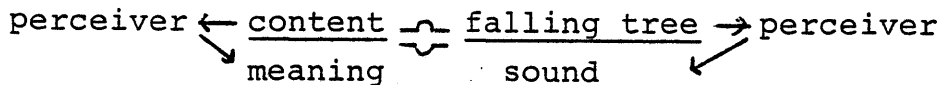
<u>image</u>	⌘	<u>a mental picture</u>
concept		a mental list of formal qualities

Ogden and Richards (1930) were among the first to point out the threefold semantic distinction of referent (the thing perceived), symbol (sign of the thing or signifier), and reference (the thought about the thing)<sup>17</sup>. The relations among these three aspects of communication were conceived in the format of a "thought and thing triangle". Some writers speak of the thought or idea, the semantic event, as a symbol because it stands for or represents the real object. Guilford's diagram of this relationship follows:



16. Jack Burnham The Structure of Art. New York: Braziller, 1973. pp. 20-21.

The perceiver is a mediator between the signifier and the signified, or between formal content and meaning, can be illustrated with a simple problem we all encountered in grade school: If a tree falls in the forest, can we say there is sound if no people are present? if people are present? Of course the answer lies in the definition of sound. Sound requires not only the energy of movement, but also a perceiver, or:



To assist in predicting environmental behavior, the following results if Osgood's verbal signage combines with symbol and content concepts:

1. The content of most primary perceptual signs should be perceived quite constantly in the same behavioral settings.
2. The content of iconic symbols will be perceived with a high similarity by those of a common culture.
3. The content of many forms will be perceived with variables meanings, depending on individual experience. The complexity and contradictions of forms, can be expected to create complex and contradicting content information, suggesting varying meanings.

---

16. (and) Roland Barthes Elements of Semiology  
 Boston: Beacon Press, 1970.

17. Guilford, op. cit. p. 225.

Any human artifact, product, or form may be considered a symbol or tool which serves the purpose of bringing "order" (meaning) into certain relationships between people and their environment. It not only comprises spoken and written language, it also comprises gestures and other types of expressive behavior (such as seeking personal space) and symbolic objects (representations) as well as more abstract concepts (connotations)<sup>18</sup>. Taken together symbols form systems which constitute culture.

An environmental setting is a symbol system embodying an entire array of symbolizing and signifying clues (formal content). When perceptually and cognitively mediated (referenced) they carry both time and place contextual meaning in addition to circumstantial meaning irregardless of place and time(existential). The existential evidence is hypothetical, intuitively expressed by writers throughout time. The existential symbolic nature of environments can be equated to the phenomena of "places". This is less mystical than it may seem. In the genesis process a "place" for a behavioral setting is more useful than a building or room as a behavioral setting. A place for "sleep" and communal activities" inform the design in a holistic sense, of all related activities whereas "a room"

18. Robert Sommers, Personal Space. op. cit. (and)  
Suzanne Langer, Feeling and Form, op. cit.

"to accomodate a bed" limits the search for environmental cuing that would reinforce user activities. Moore refers to a "place" as an ordering, in which people "know where they are - in space, time, and in the order of things".<sup>19</sup> Durrel is more explicit, "...tasting the wines, the cheeses and characteristics of different countries, you begin to realize that the important determinant of any culture is, after all, the spirit of the place".<sup>20</sup> Heidegger notes, "Close at hand are what we usually call things. When we take of things as things, we dwell in this place." An existential sense of place is created if we manage to give our place a concrete imageability or signifiabile character.

Meaning is revealed by the content of a place. The existential gestaltic place is a sense of all physical and meta-physical "things" (such as wine and cheese). These "things" are units of information, each carrying its own signage (figural or symbolic). The relative meaning of signage is illustrated by the following conceptual equivalencies:

<u>figural</u>	~	<u>facts</u>	~	<u>discursive</u>	~	<u>independent</u>	~	<u>universal</u>	~	<u>denotative</u>
symbolic values		non-discursive		dependent		contextural		connotative		

19. Moore, Allen, Lyndon The Place of Houses  
New York: Holt Reinhart, Winston, 1974. p. 32

20. L. Durrel, The Spirit of Place  
(London and New York) 1969. p. 156.

The implications for the genesis of form are related to the designer's need to predict the effects (mediated meaning) of signage on user's activities and on their state being. Figural content carries predictable meaning, whereas symbolic content carries uncertain meaning. Uncertainty becomes certainty as users inform the design process; however this demands the stating of mediate meaning which is certainly improbable. But we can conject meaning from user tendencies, rituals, traditions, social dimensions and cultural universals. These conjectures are based upon knowledge of the user; are open to refutation and are subject to change as new information is brought into the process. The following illustrates possible relationships between content and meaning -- conjectural, refutable, and provable:

Existential Formal Content	~	Possible Mediated Meaning
Bounded ~		protection
Centered ~		place in the order of the universe
Hearth (Fire) ~		center, family, protection
Stairs ~		connection between places
Door ~		entry, penetration, transition
Cross ~		suffering, salvation, vertical
Circleness ~		bounded, focused, centered, unified
Order ~		universe, cosmic, unity
Symmetry ~		order, centered, predictable, safe

## epilog

---

"Images of the past  
images of the future.  
Images of darkness,  
images of light.  
Contemplating this crushing load,  
of imagery humped around,  
in the mind of the architect,  
which seemed to be  
more dense and diverse  
every year that passed,  
it is hardly surprising that people have tried  
to dump the lot."

Lionel Brett, Architecture In A Crowded World.  
(Format edited) New York: Schocken, 1971.

## epilog

---

"Human sensibilities are the strings of the instrument upon which the true artist plays.....'abstract'? But why not avoid the symbol, as such? The symbol is too literal. It has become a form of literature in the arts. Let us abolish, in the art and craft of architecture, literature in any 'symbolic' form whatsoever. The sense of inner rhythm, deep planted in human sensibility, lives far above other considerations in art."

## Form & Content

---

"Form" is defined, used, and explored either explicitly, implicitly or both, by designers of environments and artifacts. It also describes the visual, auditory and time aspects of dance and theatre, and the auditory and time components of music. For environments and artifacts, "form" describes both physical aspects and its perceivable significations.

Many architects and educators use the term "form" interchangeably with the word "mass"; however, to be consistent with the broader meaning -- form is mass plus other aspects that are sensorially perceivable. Or, form consists of all perceivable aspects of substance, or of matter.

Psychologists suggest we have a gestaltic sense which is innate.<sup>1</sup> These are perceptual organization principles, which are responsible for our search for order, regularity, and redundancy in what we perceive. They suggest that meaningfulness is imposed by: past experiences and by the inherent organization of the sensory system, and by the

1. Wheeler, General Psychology. op. cit. pp. 253, 254, 275.

extent to which a given pattern of stimulation conforms to that previously experienced patterns.

To gestalt psychologists the appearance of any element depends on its place and function (content) in an overall pattern (environment)<sup>2</sup>. They imply the existence of an interplay between properties supplied by the object and the nature of the observer. Additionally it is postulated that if twelve listeners heard one of twelve tones of a melody, the sum of their experiences would not correspond to the experience of someone listening to the whole melody.

A correlary would be: if twelve separate users occupied eight different interior spaces of a place and four of its exterior, the sum of their experiences would not correspond to the experience of someone using all interior and exterior positions. If one experienced all twelve positions, one each day over a period of twelve days, a speculation is that the sum experience would be different than (less than, from a stimulation or arousal stance) than experiencing all twelve positions in a single day. Each person's state of motivation, stimulus seeking, personal space, and so on would be assumed to be the same.

Not only do environmental aspects (form) "communicate" with us by means of their cuing powers (content) but the total

2. Rudolph Arnheim. Art and Visual Perception  
1969, Berkeley: University of California Press

perceived communication (meaning) is more powerful than the sum of individual communications (cues). Or, Gestaltic meaning  $\gg \sum$  part meanings. There are at least three levels of potential meaning perceivable from formal content: from each aspect or part ("surface"); from the gestaltic whole ("deep"); and from their combining effects (context or summary). All perceivable aspects carry their own content, the content of their context, and gestaltic formal content.

Preziosi, an anthropologist, developed a similar form theory structured in three syntactic layerings:<sup>3</sup>

1. Material syntax: surface layer orderings of materials and their arrangements.
2. Semantic structure: surface layer of formal entities and their ordering network.
3. Formal syntax: the deep structure of space and mass.

The separation of form into formal syntax and material syntax distinguishes this construct from the previous one. Preziosi suggests that the orderings of materials are far more powerful than other aspects of form, requiring separation for evaluation. This tends to induce preconceptions in form genesis, making this distinction inappropriate for designing although useful for evaluating.

3. Preziosi Cognition in Architecture. op. cit.

The relationship between this and the earlier construct is:

formal content = semantic structure

form formal & material syntax

or,

$$\frac{\text{formal content}}{\text{form}} \approx \frac{\text{semantic structure}}{\text{formal \& material syntax}}$$

In summary, form consists of all perceivable aspects.

These aspects, or cues (content of form) are mediated

by perceivers as meaning. Form embodies three layerings

of formal content:

1. Circumstantial Content: cuing by an individual part or element, such as: mass, light, color, space, and so on; either figural or symbolic.
2. Contextural Content: cuing by the geometric order, pattern, or arrangement of two or more individual parts or elements; symbolic.
3. Gestaltic Content: cuing sense greater than the sum of all parts, elements, and their contexts; cuing of an existential sense-of-place.

**4.**

**DIMENSIONS  
OF  
CONTENT**

## Dimensions of Content

Informational units, or formal content, are the communicating power of form -- the tools of the artist or the architect to score the behavioral and perceptual matters of users and perceivers. Although many of these "tools" have been the focus of design theorists and practitioners for centuries, their understanding of the nature of these tools was left largely to intuition and open to the demands of popular taste. Formal rules were dictated by style rather than activities. Architects operate on similar dictates in contemporary society.

In order to generate form that evokes human responses (individual dimensions) that are compatible with behavioral setting needs (societal dimensions), it is necessary to embody information units signifying those meanings in form. The three layers of information or formal content (see previous Section) are seen to be circumstantial, contextual and gestaltic. Each layer suggests dimensionable connections between perceiver and parts, aggregates of parts, and the whole.

Circumstantial content aspects carry their meaning irrespective of their context, or symbolic assemblages. A door knob carries certain messages, irregardless of its content. A cup carries its own universal messages.<sup>1</sup> However nearly all aspects carry contextural messages, as nothing is free from its context. Most require a context for their existence. Their context may be a "figure - ground" relationship in order to articulate the cuing power of one aspect in relation to its context. Figural signs, which carry their content equal to their meaning, irregardless of context, are circumstantial.

Contextural content aspects are those which are assemblages, existing in context with other other aspects. These are generally polysemous (multi-meaning), unless all cuing is redundant or differentiated. A three foot by seven foot object only cues as a door when other cues exist, such as pulls and hinges. Additional cues are required to convey an "in" and "out" message. The meaning of the content of symbols is also context dependent.

The dimensions of content are both unique (elements) and shared (characteristics). This distinction is more analytical than useful for designing. This relationship is shown by

1. Oldenburg's "Fur-Lined Cup" is an example of two opposing contents, each carrying their own intended meanings; an object for drink, the other a repulsive hairy quality (or a senuous hairy experience?)...the composite meaning is either + - = -, or + + = +.

the diagram below and explored in the next Section.

### ELEMENTS

CHARACTERISTICS		Materials Mass	Space	Figurals Signs
Geometry	<u>size, scale</u>			
	<u>shape</u>			
Light & Color	<u>hue</u>			
	<u>chroma</u>			
	<u>value</u>			
Metabolic	<u>temperature</u>			
	<u>humidity</u>			
Acoustic	<u>isolating</u>			
	<u>transmitting</u>			
	<u>absorbing</u>			
	<u>reflecting</u>			
Aural	<u>sweet</u>			
	<u>foul</u>			

## Materials & Mass

---

"Form has no existence except in material, and material is for the intellect not only the means of expression of the form, but also the medium in which the form achieves existence."<sup>1</sup>

Conrad Fiedler

---

Materials have been the focus of architectural theories throughout the twentieth century. Every client asks three basic questions, each implies materials:

1. How much space is required?  
(Space is bounded by materials).
2. How much will it cost?  
(Cost is determined primarily by materials (55%+) and labor labor (45% +) .
3. What is its appearance?  
(Materials = color, shape, and so on).

1. Conrad Fiedler On the Nature and History of Architecture.  
n.p. 1878. p. 14.

There are numerous other issues involved in design, but if forms are to be built, these questions are inevitably encountered. The need to provide inexpensive mass housing and space for factories inspired designers to look to emerging technology and its dependence on the "efficient" use of materials, or their "nature".<sup>2</sup> The nature of material was its internal properties, such as: its tensile, or compressive strengths; its ductility; hardness; brittleness; opacity; thermal and acoustic capacity; fire resistance; and its manufacturing; forming and construction processes. These properties are part of any material, although manipulable, therefore they tend to have circumstantial rather than contextual meaning.

The cuing power of materials is derived from each person's past association with that material, irregardless of knowledge of its circumstantial properties. Materials evoke tactile and thermal images -- smoothness, roughness, hardness, softness, coldness and warmth. Wood against wood, metal against brick, stiffened fabric against a pliable one: all set up series of tactile images that produce sharp and immediate physical and emotional reactions.<sup>3</sup>

2. Walter Gropius, op. cit.

3. Ruesch and Kees "Function and Meaning in the Physical Environment. op. cit. p. 146.

Emotional meaning, mediated by one's associative experiences may be tested with the semantic-differential method.<sup>4</sup> We might anticipate the following: "concrete is stark, barren, and cold"; "wood is friendly, warm, and residential"; "ceramic and asphalt are institutional and boring"; "red bricks are old, quaint, and European....but white bricks are modern California"; "wood shingles are enduring and warm, but asphalt shingles are temporary and cold"; "metal is appropriate for cars, wood for houses, brick for apartments, glass and concrete or metal for commercial buildings"; and so forth.

The usefulness of perceived meanings lies in instructing the formulator of content so that user needs can be made explicit. However, the context of any aspect, such as material, influences the gestaltic as well as the contextual meaning which is more powerful than aspect meaning, or at least more difficult to correct.

4. See Appendix B.

# Space

---

"If an ambulatory encircles the polygonal choir, the entire movement within the space catches the spectator in an endless whirl. He has no thought of return, and the path forward pulls him towards an unattainable goal in infinity."

"Just as the pure group (of spaces) permits no one to enter, it permits no one to leave; we must remain forever in this central point."

Paul Frankl<sup>1</sup>

---

Space is the absence of constraints, three-dimensional, without obstruction. The perception of form is also the perception of space.<sup>2</sup> They are a contextual relationship. As space and time are correlated with the physical world, it can be studied scientifically.<sup>3</sup> In less scientific architectural theories, the "nature" of space is considered the essential art of architecture. However for this study, space is simply one of

1. Paul Frankl Principles of Architectural History.  
Original Pub 1914 Cambridge: MIT Press, republished 1968.

2. L. Zusne Visual Perception of Form.  
London: Academic Press, 1970.

3. E. Mach The Analysis of Sensation.  
Original Pub. 1914 New York: Dover, republished 1959.

the elements coexisting with materials (mass) and figural signs in a time and place (location) context.

As noted, human discoveries have spatial dimensions: personal space (intimate, social and public), crowding, privacy, territoriality, and defensible senses. Some of these infer shape and dimension. Additionally, ergometric physiological and motoring needs of humans infer shape and dimensions.

The symbolic nature of space is less definable. Associative cuing provides a conceptual base: space of "churchness" tends to be associated with previously experienced spaces of "churchness". However, the existential "place" theory may have an even more powerful sense of size and shape dimensions. The personal and social implications of a place for "social unity and communal experience" suggest roundness boundedness, centering, or focus with inferred shape characteristics and a "social distance" dimension. A "place for soliciting outsiders, selling or giving" may infer unboundedness, dispersal, or focus for shaping. In existential place making, shape and dimension relate to the perceptual and cognitive expression (gestaltic) of the nature of the humanly activities meant to "fit" with the "place".

---

4. Bruno Zevi Saper Vedere l'architettura  
Torino 1948 (referred to by Norberg-Schult, op. cit.)

Space consists not only of its physical dimensions, but also shape, connections with other spaces, olfactory aspects, thermal and light qualities, and acoustic properties. All evidence suggests that these aspects are perceived gestaltically, rather than individually. Temporal sensations are subject to unique stimulations, filtering aspects one from another and also from the whole. Since humans adapt their behavior, some meanings tend to change as a function of time and survival. Aspects which offend us in our newly acquired homes, left unattended, often lose their negative meaning as a result of our adaptability.

In spite of the adapting nature of humans, the match between spatial dimensions and behavioral dimensions is strongly advocated by behavioral researchers.<sup>5</sup> Space induces feelings of personal insecurity (sociofugal) or security (sociopetal). The center of space has more "value" than the periphery: it suggests security, allowing the use of surrounding space.<sup>6</sup> Space has an imaging value for ordering one's relationship (navigation aims, direction finding and order) with the surrounding world.<sup>7</sup> Directional qualities used in our spatial referencing and orienting systems have varying

5. P. Sivadon, "Space as Experienced: Therapeutic Implications". Environmental Psychology, op. cit.

6. Ibid.

7. Kevin Lynch, op. cit.

meaning for us: "up and down", "front and back", and "left and right" have important value in comparison to other values--"horizontal and vertical", "dense and diffuse", "open and delineated", "far and near", "symmetrical and asymmetrical", all have lesser value.<sup>8</sup>

Additionally, perceptual qualities of cues, well known in psychology, give spatial information:<sup>9</sup>

1. Gradients create a sense of depth.
2. Convergence of parallel lines create a sense of depth or distance.
3. Overlapping planes (surfaces) create a sense of depth.
4. Figure versus ground creates a sense of depth.
5. Contour lines create a sense of depth.

Although spatial guidelines to the genesis of form are the subject of on-going research, the connections between research and form theory remain vague at best.

8. Robert Beck "Spatial Meaning and the Properties Environment" Environmental Psychology. op. cit.

9. Rudolf Arnheim Art and Visual Perception. op. cit.

# Shared Characteristics

---

## SHAPE:

"Whenever we perceived shape, consciously or unconsciously, we take it to represent something, and thereby to be the form of a content."<sup>1</sup>

Shape serves to inform us about the nature of things through their external appearance. Shape suggests squareness, roundness, sharpness, strength, and so forth. It is read figurally and symbolically as images. Purely visual qualities of appearance are the most powerful of all symbols. It is they that reach us most directly and deeply.<sup>2</sup>

## SIZE:

Our perceptions of the size of space, mass, and objects is related to our previously experienced world. The arousal signification of non-normal size is commonly experienced. The "biggest" or "bigger than yours" is a prominent value of our culture. Saarinen's Gateway Arch and Oldenburg's Baseball Bat would cue different meanings if their size were as expected -- or normal. Churches, office buildings, corporate headquarters, government centers, shopping marts -- all

1. Rudolf Arnheim, op. cit.

2. Ibid.

employ size to attain high imageability by the public. Over-size lettering, and super-graphics--trademarks of the sixties -- provide highly imageable figural cuing. Smaller than expected creates its own meanings: researchers no longer use small three dimensional models of environments for perception experiments -- subjects tend to fantasize, rendering the experiment "useless".

#### LIGHT AND COLOR:

All appearance owes its existence to light (brightness) and color. Color differentiates shapes and edges. Color and light have subordinating, dominating and contradicting properties: yellow dominates red, and red dominates green, and green dominates blue; white dominates black. Complimentary colors maximize contrast. Cultural messages are carried by color because of association, and prior conditioning. These messages are unique to each person, their influence on behavior is unpredictable. Color is always related to its context, such as mass, material and so on. Brightness and light are similar to color, except many feel that space itself is created by light.<sup>3</sup> Symbolic messages such as: light = good, sacred; darkness = evil, profane -- are almost universally held, at least ascertainable for the genesis of form.

3. Ibid.

## Content Summary

---

"Both the writer and the artist (architect) know the essence of their craft is to provide the reader, the listener, or the viewer (user) with properly selected cues that are not only congruent with the events depicted but consistent with the unspoken language and culture of their audience".<sup>1</sup>

---

The context of cues carries greater potential messages than the cue itself. The arrangement, the ordering and the articulation of elements demands the greatest effort from the designer in the genesis of form. Assemblages carry numerous messages (polysemous), often contradictory, especially if the designer does not understand or cannot predict, their cuing powers. Understanding and predicting of figural cuing is simple (as was shown with the door knob). However, contextural or existential cuing is a thorny research problem. Most research on behavioral settings is pragmatically approached -- cause and effect in context with a specific place. Short of prescribing the duplication of "successful" settings, pragmatic research is suspect in its usefulness as a contexturally relevant tool, as the variables are numerous. However, the central issues of conflict

1. Edward T. Hall, The Hidden Dimension, p. 80.

between behavior and environment may prove to be its important finding. However, pragmatic findings are essential to the social and spatial effects of form.

Perception research is essential to the designer's repertoire supplementing pragmatic findings. Cuing power is perceptually based, especially for elements and characteristics other than space. It is essential to understand the perceptual as well as the physiological characteristics of people in order to predict the effects of cues. Perceptual studies indicate the nature of articulation, ordering, redundancy, and differentiation issues and suggest that they can be engaged with more than an intuitive basis.

## Ordering Content

---

"One of the principle functions of the artist is to help the layman order his cultural universe."

Edward T. Hall<sup>1</sup>

---

This is what the genesis of form is all about -- the arrangement (consciously and unconsciously) of its parts (elements and characteristics). It is the process of networking or patterning which allows: the fit or match between behavioral settings and environmental settings; people to navigate their environments; people to give meaning to their sense of being (a sense of family, a sense of safety, a sense of competence, a sense of cosmic unity and so on). In architectural literature, order or ordering, is equivalent to networking or patterning. One's purposes are revealed through ordering, whether it be: visual, style, functional, technological, natural of materials, natural of construction systems(constructivism), natural environment and energy, user activities, imageability ...or the numerous combinations and permutations of these.

1. Edward T. Hall, op. cit. p. 81

Wright and his followers espoused a search for an organic order. Their theories solicited the usage of natural phenomena, such as the tree, as a metaphoric model for the design of buildings as well as cities. It is unfortunate that Wright's critics and supporters failed to distinguish metaphoric theory from figural theory. Organic order (method of organizing constraints) is essentially an ecological model. The familiar macrophotographic reproductions of bone and plant skeletal sections reveals a highly organized geometry which is the synthesis of millions of years of evaluation and repair evolution. This geometry (order) fulfills the variety of duties needed to allow the species to survive. If it were always "perfect" or "ideal", all life would take on that pattern. Herein lies the contradiction between ecological models and social models: ecological models are based upon competition as a means for survival (therefore evolution); social models are based on cooperation and unification as a means for survival. Although the members of our society compete with each other for "survival", cooperating is an essential component of social and personal well-being. A visual example of Wright's ecological "competition" ordering is the Guggenheim in context with its neighbors and his Price Tower. The unifying orderings from the ecological model are numerous. Each part is necessary to the success of the whole, suggestive of unity, family, or wholeness. To comprehend the array of forces

inherent in the natural world, some adopt a position of a mystic, presuming a divine or ideal order.<sup>2</sup>

Organic order is advanced more fully by Christopher Alexander.<sup>3</sup> He says "We define organic order as the kind of order that is achieved when there is a perfect balance between the needs of the parts and the needs of the whole". This balance is related to growth, a unifying process, which occurs by a process of diagnosis and repair. Organisms constantly monitor their own internal state. As parts dysfunction they are repaired, modified, or replaced. He suggests that parts of any environment are successful to the extent that they solve problems or conflicts that occur within them. Evaluation and modification can be seen as essential components of organic order. This suggests human management for an on-going organic order, not unlike the managing role suggested by behavioralists.

Adaptive and ad-hoc ordering is employed in infinitely changeable open-space planning such as for schools and offices. The management of these places is crucial to their success as a behavioral setting.

2. This is perhaps similar to a Platonic view of life and relates to the "divine order of things".

3. Christopher Alexander, The Oregon Experiment. Center for Environmental Structure, n.p.

Order is the summation of the dimensions of content. It is conceptually equivalent to gestaltic form, including geometric (space giving), physical material (mass), light, color, properties. It services our existence within environments, for orientation, location, cuing behavior, and so on. Its effective cuing power can be manipulated through evaluating human activities and arranging cues to fit the needs of those activities. Additionally, ordering or manipulating symbolic and physical cues are aspects of existential place making.

The dichotomy of ordering purposes (a conscious intellectual activity that involves users and managers) and tools (manipulators which are perceptually and behaviorally based) that we use to actualize those purposes, is diagrammed on the following page.



An ideal or Pure Order: Pure Form exists when environmental settings accomodate and reinforce behavioral activities and personal sense-of-being. The genesis of form involves manipulating the variables to reach this ideal. It necessitates that all aspects are known, and that the distortions of its surrounding context allow its actualization. "Distortions" (contradictions due to circumstances of constraints such as legal, economic, energy, political and so on) bear on all problems. Their manifestation in form and formal content is the subject of debate. Venturi advocates an "expressive attitude, wherein these complexities and contradictions are basic to our existence, thus they warrant physical or symbolic expression in our environmental setting."<sup>5</sup>

Contradictions and complexities should not be a basis for ordering. Venturi and Bush-Brown's work is a bit like the "Fur-Lined Cup" (a reversal of content for stimulation or arousal purposes) -- or a "Las Vegas Lined Williamsburg Cup" or perhaps a cultural "happening" from the 1960's, a reference to our past. Is this what architecture and art are all about -- interpreting the relevant issues surrounding a problem, and formulating a strategy that hopefully addresses them?

5. Ken Venturi, Complexity and Contradiction in Architecture.  
(New York, 1967.)

A more useful insight into the nature of order is from Proshansky<sup>6</sup>:

"Every component of the environment interacts or has defined relationships (order) with every other component in two ways: (a) it acts on all other aspects, (b) it is acted upon by all other aspects and in particular, receives the consequences of its own action in the terms of a changed environmental situation."

Additionally, Proshansky suggests that environments are experienced as a unified field, thus it can be assumed all aspects of environments are somewhat contextural in nature, and ordering is a context-conscious activity:

"A setting is experienced as a unified field in which all senses participate."

Another conclusion, from Proshansky, suggests that ordering qualities (formal content) extend beyond the physical place to include all social settings and the actions of people:

"The setting includes not only the physical aspects, individuals and groups. They are cognized as a set of mental images."

Lynch suggests that these mental images are perceiver specific time related, and symbolic in their ordering usefulness to the perceiver:<sup>7</sup>

6. Proshansky, et al op. cit.

7. Kevin Lynch op. cit. p. 6.

"There may be little in the real object (physical form or artifact) that is ordered or remarkable, and yet its mental image has gained identity and organization through long familiarity. One may find objects easily on what seems to anyone else to be a totally disordered work table. Alternatively, an object seen for the first time may be identified and related to not because it is individually familiar, but because it conforms to a stereo type already constructed by the observor".

The notion that we strive to order our disordered environment is an important concept in several ways: disorder implies apparent conflicting cues (formal content); it illicit a sense of confusion, and miscomprehension among perceivers, blocking one's coping behavior (navigating, orientating, communicating, and so on).<sup>8</sup>

The need for order not only includes the coping behaviors of orientation, navigation, and function, but is also perceptually related. Wheeler notes the effect of our mind on our perceptions:<sup>9</sup>

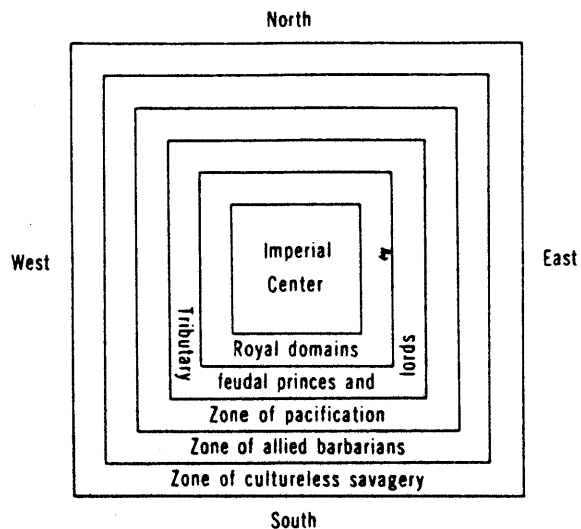
8. Abraham Maslow, op. cit. p. 132. Maslow, as well as other, psychologists, connects one's inability to cope with neurosis. He defines coping behavior as conscious behavior which comes into existence to get something done, such as walking to the grocery store.

9. Wheeler, et al, op. cit. p. 253  
Referencing to the research of Garner (1966).

"We perceive and remember more easily those things that are simply well organized. Chaos is difficult to perceive as such. Complex patterns are unstable have alternative modes of perceptual organization and are organized only after considerable effort. ....Do we force simplicity on complex events because that is the way our brain works? Order may be more satisfying and clear, but perhaps our brain seduces us. (The) mind organizes, shapes, groups, remembers, orders, reveals, and so on."

People tend to carry out their activities in an identifiable spatial order. Focal centers relating to their surrounding, conceptualizes a nearly universal ordering of environments. Tuan's research shows that people tend to structure space, both geographically and cosmologically, with themselves placed at the center and with concentric zones of decreasing importance to the world.<sup>10</sup> The diagram on the following page is an example of the traditional ethnocentric Chinese world view, dating back to the fifth century B.C. (reprinted from Tuan).

10. Yi-Fu Tuan, op. cit. p. 38.



The focusing power of "the place of fire" is well known -- such as the hearth, the oven, and so forth. The "place for water" is significant to cultures with scarce water supplies. The reasons behind this significance is less important than the fact that certain places have more power signification in our lives than do others. This is equivalent to focusing. Aside from metaphysical and physiological explanations, psychological conditioning suggests that focusing is arousal or stimulation connected, such as: more novel stimuli (contrasting, unique, or singular) tend to be more arousing.<sup>11</sup> This is similar to the figure versus ground observations known to artists and art psychologists.<sup>12</sup>

11. Mehrabian and Russell, op. cit. p. 85

12. Rudolf Arnheim, op. cit.

In conclusion, it is suggested that the conscious and unconscious usage of formal content (cues) and the ordering of those cues to fulfill the intentions of their users or perceivers is the commonly shared function of both architects and artists. It is the attachment of architects and artists to their users or perceivers real needs, and values, that signifies socially responsive actions.

## epilog

---

"Architectural form and any architectural theory behind it are so relative in their interpretation as to be unrelated to any ascertainable reality.....Classicism produced identical triplets in Stalin's Moscow, Hitler's Germany and Roosevelt's Washington."

Sibyl Moholy-Nagy

"The Cannon of Architectural History"

History, Theory and Criticism in Architecture

**5.**

# **CONCLUSION**

# Conclusion

---

The socially responsive art of designing form is the art of embodying the purposes of users in form. Ascertaining every purpose of every user over a long period of time, is a complex and nearly impossible task. Each person maintains individual as well as group purposes, which are both conscious and unconscious; physiologically, socially and functionally measurable; psychologically and meta-physically immeasurable. In creating form that embodies these purposes, the complexity is even further complicated by the differences between the designers' perceptions of user purposes and the user's actual purposes. If this disparity can be bridged and essential purposes identified, the design task is a heuristic search for the most correct match between intended purpose, form, content, and effective purpose.

The most correct, or pure, form is the physical and meta-physical array of cues, or content, which are ordered to communicate messages which allow users to actualize their own purposes. Content is the semantic or communicating power of shape, size, color, hardness, softness, porosity, space, transparency, focus, texture and so on of physical form. Each person mediates content, deriving unique meanings as a result

of their own motivations and personal construct. Every aspect of the physical and meta-physical environment has potential meaning to people in a variety of ways -- even a crack in the sidewalk can break your mother's back, it can break a contractor's bank account, or an architect's reputation. Note -- the crack conveyed a negative message to everyone, even though each mediated the message in response to their own purposes.

All form "speaks" to us. We individually understand its messages; we share a few of these understandings with other people. Shared, as well as individual, meanings of formal content permit shared, as well as individual, activities to occur without interference from the physical world. We organize and use its' messages to suit our own purposes. Highly imagable aspects assist our navigation; focusing aspects assist our social interactions; functional aspects assist our self competency; visual enclosure assists our sense of privacy; and meta-physical aspects reinforce or change our feelings, our sense of being. It is on the basis of the cause and effect aspects of form, that it's genesis can be suggested.

In developing a strategy for form genesis, it must be recognized that people and their accessory objects are perhaps the most powerful causes of the effects we perceive in our

environments, and must be presumed to be an integral part of a changing environment. Additionally, it must be understood that every aspect is perceived not only by itself, but in context with others. A door knob is "read" as a means to open a door, a door as a means to change one's place, to change one's place may be to change one's activity, and so on. Perceptual and cognitive processes allow us to internalize our purposes as a personal state of being at any point in time -- a sense of exiting, entering, arrival, departure, change and so on; rather than an entire set of cause and effect evaluations.

If your purpose is to cross a street, the following scenario might develop: step off the curb, walk twelve steps, wait for a car to pass, walk to the opposite curb, and step up on to it. Pragmatically, a simple set of everyday actions. However, as you leave the curb while continuing your walking you do not consciously say "I am leaving the curb, I am moving my left foot, now I move my right, a car is approaching, I will stop, now I will wait, take the next step, step up six inches". Instead, the entire set of actions occur as the result of: physical cues mostly which are "felt" unconsciously; perceived at any moment with a sense of the previous, the present, and the future (neither sequentially nor individually additive): and most importantly, the purpose

of crossing the street guided our actions. Or in other words, our purpose motivates our actions (to cross the street), cues guide our actions (step up onto the curb) and fulfillment of our purpose is necessary for physiological and psychological well-being (we felt competent as we were able to cross without assistance and without injury). This suggests that our purposes order our actions and, potentially, our sense of well being.

Crying is an insufficient effect for an actor whose intention is to characterize a sad person. Tears without emoted sadness is functional superficiality. Sadness is expressive of deep emotion, inner feelings. Although tears are figural symbols of pain, they don't optimize the audience's full realization of these feelings. Tears are form without optimum content. Tears with all other aspects of being sad is form with optimum content. In order to be effective, an actor delves into the underlying nature of their intentions and manifests it, in their form. In designing form, it is essential that the underlying nature of any purpose or activity be explicitly shared by the user and the designer, if the effects of form are to be more than functional superficiality.

A comprehensive view of the genesis of form is beyond the scope of this study. We would need to discuss factors such as the

control of activities by management, economic feasibility, legal constraints, energy conservation, style, personal whim, and so on. Additionally, methodologies for converting abstract formal content into physical form would be essential to a full view of genesis. The concept of symbols certainly underlies these methodologies, as do all the dimensions of formal content as outlined in Chapter Four . The studio problem and it's related methodology, shown in Appendix A, give insight into a method for entering a problem with an identifiable user group with a given purpose.

In summary, it should be clear that any form aspect that suggests meanings counter to those which reinforce the underlying purposes of user activities can only but diminish the probability that such purposes can be fulfilled. In short, all non-essential content must be redundant, all essential content articulated and above all, ordered to reinforce the state-of-mind essential to actualize one's life purposes.

In order to clarify certain issues raised by the study, the following additional research is required:

1. The meta-physical cuing properties of form, especially as they relate to common activities, such as: dance, theatre, spectator sport watching, and so on.

2. Aspects which allow the expansion of the dimensions of formal content, especially behavioral research on: focusing activities, criteria for predicting the richness of behavioral settings, and the necessity of order for personal well-being.
3. Studies to suggest guidelines for converting formal content into form for public, semi-public, semi-private and private activities.
4. The applicability of the study to heterogeneous, non-ritualized group activities. I suspect it is at least partially inappropriate as a reliable method.
5. Case studies that demonstrate the differences between functional settings and those which are both functional and emotionally reinforcing.

"Once you have realized that art is a means for inquiring, that happily results in evocative objects as well for profound insight for the inquirer, then you are also onto the riddle to which Louis Kahn referred to when he said "Make the intangible tangible, so it can become intangible again."<sup>1</sup>

1. Robert Harris "bootstrap Essence-Seeking"  
Journal of Architectural Education, Volume Twenty-Nine, No. 2.

## epilog

---

"What Eve needed was a garden of Eden: what she wanted was a certain apple. Architects know where they sit here - shoulder to shoulder with Karl Marx. "It is the artist's privilege" they have been taught, "to give the public what it does not know it wants.""

Lionel Brett

Architecture In A Crowded World

**6.**

# **APPENDICIES**

# A. Studio Problem

---

## PREFACE:

While teaching at Washington State University at Pullman, Washington in 1974, my colleague, Spencer Wolfe, introduced me to the issues which gave rise to this study. As a teaching team we formulated a design studio problem based on them.

## THE PROBLEM STATEMENT:

The following year I was the Visiting Professor at the University of Idaho. With modifications, I reissued the problem statement, entitled "A Place for Dance". It was issued in two sequential parts (A and B). PART A introduced the behavioral activities (dance) and the cultural context (500 person community with a culture to be defined by the students through group discussions). This part was issued to the students for their completion, prior to the issuance of PART B, which gave circumstantial information regarding the site, climate, legal and economic constraints (termed "distortions" in the problem statement).

## DEMOGRAPHIC DATA:

The class consisted of sixteen students, nine were transfers from a terminated program. All were in their second year of design studio.

TEACHING OBJECTIVES:

1. To learn a process for matching an environmental setting to a previously agreed upon behavioral setting. A related aspect was to defer the impacts of "personal whim" and environmental constraints, until behavioral and activity settings were clearly in mind.
2. A related aspect was to examine the activities of others, and to observe group behavior differences and similarities.

PROBLEMS WITH THE PROBLEM:

The terminology used in the problem statement was new for most students. They were more obsessed with the new terms such as "order", "pure", "form", "existence-will", and "essence" than with the issues. Most of these terms are from Kahn's writings, insignificant to most architects. To rewrite the problem, I would suggest the limiting of terms to those "normally" understood by clients --or at least in the language of other architects. It was especially difficult for students who were from the rural farm area. For most students, common terms such as "form"

meant "front elevation", "Order" was something classic, "Greek" or "Roman", "Essence" meant perfume. Group sessions were required to break these blocks, illiciting equivalencies from past experiences. The second major block was in deferring "esthetic judgement", site considerations, functional aspects, and so on. Most students had learned to solve problems by relying on "goose-egg" plan diagrams, or functional inter-relationships. To defer these judgements was somewhat traumatic.

The third major block was the notion that physical places have communicative power. This underlies the theory that cuing is a tool for reinforcing human activities. Students were introduced by the problem to behavioral aspects, such as social distance, personal space, and so on -- new information for most. To suggest that social behavior is a potential for ordering space was incomprehensible.

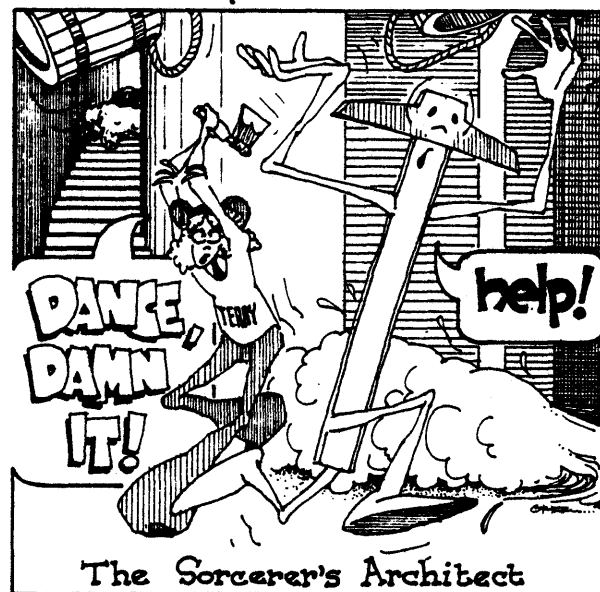
Students coped with the new conceptual information and problem solving method, however most were unable to be expressive in their final solutions, in more than a "pure form" manner. This may have been predictable due to time constraints and coping behavior.

The most interesting response, however, was from other teachers (I wrote the problem, but three of us issued it). Everyone interpreted it differently. They viewed it as a "limbering-up" exercise. Most of their student's solutions

were functional plan concepts with applied exterior elevations. Symbolic aspects were figural images of dancers.

PROBLEM SUCCESS :

This is difficult for me to evaluate. I was so involved with the students, that it became difficult to separate their success and problems from mine. Seventy-six percent of the students rated the course in the top 10% of all courses. Twenty-six students signed up for my studio the following semester. The student newspaper responded to the studio with the following cartoon:



OBSERVATIONS ON TEACHING:

The problem, my experiences with it, students, faculty members and the institution created the need for a personal theory from which to operate. In retrospect, this seems to have been mine:

Among the dilemmas design instructors encounter is the undefinable nature of the thing they are trying to define, namely design itself. They are confronted with the constraints of the 20 minute sessions, three afternoons per week and the semester deadline; but they face the inevitable need for "all the time it takes" to reach a "more correct" solution.

Students face similar dilemmas. They have three years to learn the undefinable "it". However, they discover one does not learn it -- they must "feel" it. They only have a few short weeks to solve their unsolvable problem. To receive a good grade the student must feel what their instructor feels but he himself cannot communicate.

The context of one's teaching setting is defined by the university policies (if the policy dictates a one to 30 teacher to pupil ratio, one's course of action will be different than for a one to eight ratio); the status seeking of fellow peers (the case of the peer who perceives their power is heightened when sublimating those around them is commonplace); student background; curriculum misfit with one's own values; and the instructor's need for personal gratification (tenure, student approval, peer approval and so).

The following matrix is presented as my perceived generalized theory of actions along with anticipated dilemmas and constraints. I would expect that my course of action would change as constraints and opportunities change --- and of course as theories are tested, changes will follow. The important task is to predict the consequences of actions, so that those actions are positive.

WORLDVIEWS OF EDUCATORS:

Facilitator for learning to design and plan.

Resource person for others.

Link between real and academic world.

Part of a fragmented system.

DILEMMAS IN TEACHING:

1. Personal theory of design (tendency to advocate).  
versus  
Student need to develop their own theories.
2. Need for total knowledge of the world.  
versus  
The limits of what you know, what you have experienced.
3. Personal ego needs.  
versus  
Openess to wrong, to welcome opposing views.
4. Our desire to be architects -- to do.  
versus  
Need to allow students to do.
5. If you can't talk about it, you can't communicate it.
6. View of architecture as art.  
versus  
Views of archtiecture as scientifically determinant.
7. Limited time available.  
versus  
Everyone's need for more time to learn and design.
8. Need to evaluate student performance by grading.  
versus  
Evaluation based on prescribable actions, which is counter-productive to facilitator's role.

TIME AS A CONSTRAINT:

Prescribed by institution, 20 minutes per student per week.

Need to link to real world "time is money".

Tendency to spend more time with favorites.

Teaching time varies: prescribable for determinants  
 continuous for undescrivable  
 prescribable for algorithmic  
 continuous for heuristic

CONTEXT OF ACTORS:

Yourself:	Student:	Institution, Peers :
Facilitator.	Demand results.	Team member.
Resource	Want to know you.	Slow to change.
High ego.	Seek approval.	Competitive.
Employee.	Want answers.	Fragmented.
Leader.		

CONSTRAINTS TO ACTIONS:

Available time.

Policies of institution.

Student background/abilities/aspirations.

Curriculum.

Need for gratification from peers.

Students' evaluation.

## PART A - UNDISTORTED DESIGN PHASE

### PROBLEM STATEMENT: A PLACE FOR DANCE

#### 1.0 INTRODUCTION

You are a member of a community of 500 persons - a community that your Section will define. You have special creative skills which are essential to the well-being of your group - you are a "Conceiver of Space".

The community has decided that Dance is a necessary activity for their well-being. You, as the "Conceiver of Space", will discover the nature of the space for the community's dance. With great input from your community, you will help them to discover what Dance is and what rituals may be expressed through Dance. You will immerse yourself into your assignment - you must be a leader and a participant simultaneously in order to fully understand the underlying needs of your community and the basic essence of Dance. You and your group will search for the essence of Dance from the single individual up to its broadest implications.

After you and your community have ascertained the nature of the essence of Dance (its Content), then you, as the "Conceiver of Space - the Architect", must creatively struggle to understand the nature of the Form (the Existence-Will) which express the activities inherent in the essence of your community's Dance. You will ask yourself, "What does it want to be?" Your community is awaiting your insight.

In Part B of this Problem (to be distributed in about four weeks) you consider the forces of location, building materials, methods, costs, and so on which will distort the pure design "Existence-Will" (Form) at which you have arrived.

#### 2.0 DISCOVER THE ESSENCE OF DANCE

This portion of the design process will allow each of you to discover along with the other members of your section, the underlying unique qualities of Dance. You intellect and physical involvement will be required. Your discoveries will be recorded and synthesized into a clear, concise, written description of the ESSENCE OF DANCE (the Content of Dance, if you prefer).

## 2.1 PHYSICAL INVOLVEMENT DANCE

All sections will experience some basic expression of Dance. See schedule.

## 2.2 INTELLECTUAL INVOLVEMENT: COMMUNITY

Each section will collectively describe the characteristics of the community for which a space for dance will be conceived. Considerations should at least define: growth patterns, work ethics and economic base, rituals, food supplies, social structure, human and natural energy attitudes, environmental consciousness, cultural and recreation aspects, governmental organization and crime prevention.

## 2.3 INTELLECTUAL INVOLVEMENT: DANCE

Each section will individually research and collectively discuss Dance in order for each person to arrive at their own understanding of the Essence of Dance. Mind exploration through questions and other forms will lead you to answers and more questions. The following are examples of considerations:

What is the dance of life?  
 Is dance necessarily "scored"?  
 What impulses lead us to dance?  
 Is dance collective or singular?  
 How are sense affected by dance?  
 What was the first dance?  
 Is there a global dance?  
 Does dance extend beyond movement, space, and time?  
 Is dance a focus on self?  
 Define rhythm.

### Due THE ASSIGNMENT:

Convey in writing your feelings of the essential nature of dance. Clarity of expression indicates clarity of understanding. Presentation technique at student's option on one 15" x 20" illustration board.

## 3.0 "EXISTENCE-WILL (FORM) OF THE SPACE FOR DANCE

Having a great understanding of the basic nature of dance, and its relevance to the defined community, you will now conceive the most appropriate order of space for your community's dance. Through thoughtful reflection, you will ascertain the purest, undistorted expression of space that wants to exist because of the basic nature of dance.

### 3.0 (Continued)

This will not be a physical space, but "FORM" of "EXISTENCE WILL", which is the sum total of all perceivable characteristics. A subtraction, addition or reordering would destroy its essential nature.

#### 3.1 CONSIDERATIONS: Among things you may examine are:

Are there certain aspects of you dance which demand an order of major space to sub space?

Are there dance aspects which require base plane changes? Reference or highly important ordering points?

Based on rituals, how might a sequence of dance unfold?

Based on spontaneity, how is freedom encouraged? Security?

How are all human senses touched by dance? (Color, light, sound, texture, water, fire.....)

#### 3.2 THE ASSIGNMENT:

Describe in words the "FORM" or "EXISTENCE WILL" for space, made necessary by your understanding of dance. Envision the character and necessary order of space. Express the drama, score, or excitement of your vision. Draw a symbolic diagram of the order of essential parts (FORM DRAWING). Presentation to be consistent with you ESSENCE OF DANCE presentation. Limit to 15" x 20" illustration board.

As the final expression of your FORM for dance, you will now conceive a three dimensional physical reality of your metaphysical FORM. Your media is to be clay on a 20" x 20" thick base. Scale: 1/8" = 1' 0", geometric ordering. Building materials, costs, codes, structural systems, and so forth will only be considered during the next part of this problem.

### 4.0 TIME SCHEDULE

- Issue Problem (Part A - Undistorted)
- Meet for dancing: place, time to be announced
- "ESSENCE OF DANCE" submittals due
- "EXISTENCE WILL" or "FORM" submittals due, including models
- Issue problem (Part B - Distortions: Climate, codes, and so on).

5.0 SUGGESTED ADDITIONAL READING:

The Universal Traveler, Korberg & Bagnall.  
pp. 59 - 65.

Man Creates Art Creates Man, Duan Preble.  
pp. 45 -51.

## PART B - DISTORTED DESIGN PHASE

### 6.0 INTRODUCTION TO PART B

You have conceived the pure FORM for the Space for Dance of your community. Your FORM reflects the basic roots of Dance (unity of self and body through movement) and the special rituals of your community. You must now subject your pure FORM to the natural forces (determinants) which will have an altering or distorting impact on the purity of your FORM. The distortions will not reorder FORM, the FORM will order the distortions (for purposes of this problem).

Distortions occur as we try to accomodate various circumstantial factors (determinants). These distortions are often the source of increased richness, complexity, and vitality. These accomodations must reflect, honor, or acknowledge the inviolable "content", "spirit", or "essence" of the undistorted phase of our creative process. Among life expectancy, climate (weather), vandalism, and so on.

### 7.0 DETERMINANTS

7.1 ENVIRONMENTAL (NATURAL): Location is near Ketchikan, Alaska. This is in the south-eastern part of Alaska. Dense, lush forests on steep slopes, muskeg valleys, 160 inches of rain yearly, up to 100 m.p.h. winds, relatively severe earthquakes, and mild temperature extremes are characteristic of this Pacific coastal island. For purposes of this problem, you can create your own land forms and consider them as existing conditions. Fuel sources are very limited.

7.2 CONSTRUCTION COSTS: As you deem necessary. Consider the remoteness of this area for supplies (there is a concrete batch plant in Ketchikan). Most finished materials, i.e. brick, tile, carpet, wood, is shipped from the lower 48 in cargo containers. Lumber mills are in the area, and a shake plant is about five miles from Ketchikan.

7.3 LIFE/SAFETY: The 1973 Uniform Building Code is enforced in this area. Location is in Fire Zone 3. Group B-2 occupancy, if fully enclosed. See Table 5-C for allowable floor area for Types of Construction;

### 7.3 (Continued)

Section 506 for allowable area increases. Determine the number and width of exits from the occupancy load figures in Table 33-A. See Section 605 for general requirements. Physically handicapped persons shall be accommodated.

7.4 PSYCHOLOGICAL: Consider effects on people due to color, group sizes, spatial size, privacy, (audio and visual), security from crime, smell, cultural conditioning, and so on.

7.5 ERGOMETRIC: Develop complete understanding of wo/man's physical size, reach and so on.

7.6 STRUCTURE: From available charts, determine span/cost effects (costs should consider initial maintenance and replacement --- and natural versus human energy consumption). Assume fire retardant membranes for membrane structure.

7.7 ENVIRONMENTAL (MAN MADE): Ketchikan is a port fishing village, consisting of "functional" wo/man structures -- generally painted white wood, weathered raw wood or aluminum. Surrounding areas contain native housing, cultural artifacts such as totem poles and tribal ceremonial places. No buildings are listed in the National Historic Register on the basis of significant architecture.

### 8.0 THE ASSIGNMENT

8.1: From the determinants listed in 7.0 plus the determinants you feel should be considered, gather all of the data relevant to this problem. Since time is limited, we will divide into groups for this phase of the problem. All information shall be recorded on 5" x7" white "snow cards" (note cards). One fact per card. In the lower right hand corner, place your initials and date. Identify the determinant, i.e. PSYCHOLOGICAL: COLOR in a consistent graphically clear manner. All cards should be easily read from a distance of 3 to 5 feet. The cards will be tacked up in the lab in a manner similar to the attached matrix.

This work is due at the end of the period on \_\_\_\_\_.

8.2: The final completed project, which will be judged on your ability to reflect FORM plus the order developed in the distortions, is due on or before 5:00 p.m. \_\_\_\_\_.  
The presentation should reflect your earlier work on this project, with improvement, of course. Develop your own graphic system on 20" x 30" illustration boards (consider the 20" side as horizontal, as you did on the earlier work).

8.2 (Continued)

Color is your option -- restraint please. Mandatory drawings: community diagram, mounted on your building model. Models: Place for Dance at 1/4" = 1' 0", base to be 40" x 40" (+), 2"thick; wall section to show the order of structure, mechanical and electrical components at 1" = 1' 0", base to be 20" x 20" thick.

# B.

## Semantic Differential Measures of Emotional State or Characteristic (Trait) Emotions

### Instructions to Subjects

When these scales are used as measures of EMOTIONAL STATE in a particular setting, the instructions are as follows:

Take about two minutes to really get into the mood of the situation; then rate your feelings in the situation with the adjective pairs below. Some of the pairs might seem unusual, but you'll probably feel more one way than the other. So, for each pair, put a check mark (Example: -----:~:~:~:-----) close to the adjective which you believe to describe your feelings better. The more appropriate that adjective seems, the closer you put your check mark to it.

When the scales are used as TRAIT measures, that is, as measures of a person's characteristic emotions over time, the instructions are as follows:

Each pair of words below describes a feeling dimension. Some of the pairs might seem unusual, but you may generally feel more one way than the other. So, for each pair, put a check mark (Example: -----:~:~:~:-----) to show how you feel IN GENERAL, that is, most of the time. Please take your time so as to arrive at a real characteristic description of your feelings.

<b>Pleasure</b>		
Happy	-----:~:~:~:-----	Unhappy
Pleased	-----:~:~:~:-----	Annoyed
Satisfied	-----:~:~:~:-----	Unsatisfied
Contented	-----:~:~:~:-----	Melancholic
Hopeful	-----:~:~:~:-----	Despairing
Relaxed	-----:~:~:~:-----	Bored
<b>Arousal</b>		
Stimulated	-----:~:~:~:-----	Relaxed
Excited	-----:~:~:~:-----	Calm
Frenzied	-----:~:~:~:-----	Sluggish
Jittery	-----:~:~:~:-----	Dull
Wide-awake	-----:~:~:~:-----	Sleepy
Aroused	-----:~:~:~:-----	Unaroused
<b>Dominance</b>		
Controlling	-----:~:~:~:-----	Controlled
Influential	-----:~:~:~:-----	Influenced
In control	-----:~:~:~:-----	Cared-for
Important	-----:~:~:~:-----	Awed
Dominant	-----:~:~:~:-----	Submissive
Autonomous	-----:~:~:~:-----	Guided

# Bibliography

---

- Alexander, Christopher Notes on the Syntesis of Form.  
Cambridge: Harvard University Press, 1966.
- \_\_\_\_\_, The Oregon Experiment. Center for Environmental  
Structure, undated.
- \_\_\_\_\_, A Pattern Language. New York: Oxford University  
Press, 1975.
- Altman, Irwin "Privacy: A Conceptual Analysis". Department  
of Psychology, University of Utah, date unknown.
- Anderson, Stanford, Editor Planning for Diversity and Choice.  
Cambridge: M.I.T. Press, 1968.
- Arnason, H. H. History of Modern Art. New York: Abrams,  
undated.
- Arnheim, Rudolph Art and Visual Perception. Berkeley:  
University of California Press, 1969.
- \_\_\_\_\_, Visual Thinking. Berkeley: University of California  
Press, 1969.
- Barthes, Roland Writing Degree Zero and Elements of Semiology.  
Boson: Beacon Press, 1970.
- Bennett, Corwin Spaces for People. New Jersey: Prentice-  
Hall, 1977.
- Blake, Peter Le Corbusier Architecture and Form. Baltimore:  
Penguin, 1960.

- Brett, Lionel Architecture in a Crowded World. New York: Schocken, 1971.
- Bronowski, J. Science and Human Values. New York: Harper & Row, 1965.
- Burnham, Jack The Structure of Art. New York: Braziller, 1971.
- Canter, David V. Editor Architectural Psychology. London: RIBA, 1970.
- Chomsky, Noam Language and Mind. New York: Harcourt, Brace and World, 1968.
- \_\_\_\_\_, Aspects of the Theory of Syntax. Cambridge: M.I.T. Press, 1965.
- Deasy, C.M. Design for Human Affairs. Cambridge: Schenkman, 1974.
- Dickie, George and Sclafani, Ricard Editors Aesthetics, A Critical Anthology. New York: St. Martins, 1977.
- Frankl, Paul (1914) Principles of Architectural History. Translated by J.F. O'Gorman. Cambridge: M.I.T. Press, 1968.
- Friedman, Yona Toward a Scientific Architecture. Cambridge: M.I.T., 1975.
- Goodman, Nelson Languages of Art. Indianapolis: Bebb's- Merrill, 1968.
- Goodman, Robert After the Planners. New York: Simon & Schuster, 1971.
- Gropius, Walter The New Architecture and the Bauhaus. Cambridge: M.I.T. Press, 1974.

- Guilford, J.P. The Nature of Human Intelligence. New York: McGraw-Hill, 1967.
- Hall, Edward T. The Hidden Dimension. New York: Doubleday & Company, 1969.
- Halprin, Lawrence The RSVP Cycles. New York: Braziller, 1969.
- Jung, Carl G. Editor Man And His Symbols. New York: Dell, 1964.
- Kutcher, Arthur The New Jerusalem Planning and Politics. Cambridge: M.I.T. Press, 1975.
- Langer, Susanne K. Feeling and Form. New York: Scribner's, 1953.
- Lee, Terrence "Do We Need A Theory?: Architectural Psychology Cambridge: W. Heffer & Sons, 1970.
- Lynch, Kevin The Image of the City. Cambridge: M.I.T. Press, 1960.
- Maslow, Abraham H. Motivation and Personality. New York: Harper & Row, 1970.
- Mehrabian and Russell An Approach to Environmental Psychology. Cambridge: M.I.T. Press, 1974.
- Moore, Allen, Lyndon The Place of Houses. New York: Holt & Rinehart, 1974.
- Mumford, Lewis The Myth of the Machine. New York: Harcourt Brace, 1964.
- \_\_\_\_\_, The Pentagon of Power, New York: Harcourt Brace, 1964.

- Negroponete, Nicholos Soft Architecture Machines. Cambridge: M.I.T. Press, 1975.
- Newman, Oscar Defensible Space. New York: Collier, 1972.
- Norberg-Schulz, Christian Intentions in Architecture. Cambridge: M.I.T. Press, 1965.
- Osgood, Charles E. The Measurement of Meaning. Urbana: Illinois Press, 1957.
- Piaget, J. The Child's Conception of Space. London: Routledge and Kegan, 1956.
- Perin, Constance With Man In Mind. Cambridge: M.I.T. Press, 1970.
- Prak, Lunning N. The Language of Architecture. Paris: Mouton, 1968.
- Prather, Hugh I Touch the Earth, the Earth Touches Me. New York: Doubleday & Company, 1972.
- Proshansky, Ittelson and Rivlin Environmental Psychology. New York: Holt & Rinehart, 1970.
- Ross, Helen, E. Behavior and Perception in Strange Environments. London: George Allen & Unwin Ltd, 1974.
- Royce, Joseph R. Psychology and the Symbol. New York: Random House, 1965.
- Shahn, Ben The Shape of Content. New York: Random House, 1957.
- Sommer, Robert Personal Space. New Jersey: Prentice-Hall, 1969.
- Tuan, Yi-Fu Topophilia. New Jersey: Prentice-Hall, 1974.

Tzonis, Alexander Towards a Non Oppressive Environment.  
Boston: i Press, 1972.

Wade, John W. Architecture, Problems and Purposes. New  
York: John Wiley & Sons, 1977.

Wathen-Dunn, Weiant Editor Models for the Perception of  
Speech and Visual Form. Cambridge: M.I.T. Press, 1967.

Wheeler, Goodal, Deese General Psychology. Boston: Allyn  
and Bacon, 1975.

Whiffen, Marcus Editor The History, Theory and Criticism of  
Architecture. Cambridge: M.I.T. Press, 1964.

Wright, Frank L. An Autobiography. New York: Duell, Sloan  
and Pearce, 1943.

Zusne, Leonard Visual Perception of Form. New York:  
Academic Press, 1970.