

PATTERN AND COMPLEXITY:
PSYCHOPHYSICAL NEEDS AS DETERMINANTS
IN THE VISUAL ENVIRONMENT

by

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ABSTRACT

This paper reports on a study carried out to explore some aspects of the relation of behavior to the physical context. It attempts to investigate the possibilities of psychophysical needs as determinants in evaluating and structuring the visual environment. For purposes of this study, signs in the context of the city were selected as specific elements of the visual environment which would be analyzed in terms of the research. Advertising, information, and identification signs were examined in terms of their function as design elements within the total visual image of the city, and as they could relate to perceptual and aesthetic processes. The intent of this paper was to establish a practical basis for a new approach to the structure of sign control in urban areas.

The initial step was to outline the various theories relating to perception, to describe the perceptual process as it is generally understood, and to examine some of the complex variables which are operative in the processes of perception. Both physical and psychological factors combine in intricate relationships of inherent needs and capabilities as well effects of learning and experience. In addition, the relationship between aesthetics, or the formal elements of art, and basic psychophysical needs for pattern and complexity in visual stimuli were investigated. Material from the areas of psychology, biology, and design was explored in an attempt to bridge some of the many gaps which now exist between behavioral sciences, art and the planning of the visual environment. Finally, a proposed structure for a sign control by-law was

developed which would provide a more comprehensive design basis than that which presently exists, and which in adoption, would be more consistent with the needs described in the processes of perception and aesthetic satisfaction.

As a result of this study, it was concluded that within any given culture, broad similarities occur in the related processes of perception and aesthetic satisfaction. These two processes have both physical and cultural components, and learning and motivation seem to play large roles, as do the innate factors. The search for stimulus variability and complexity seems to be a basic incentive in human behavior. There is also evidence of an optimal perceptual rate within homogeneous cultures. Further research in order to develop adequate methodology to test optimal perceptual responses and level of satisfaction of the visual environment is essential. However, these psychophysical processes provide a more realistic and comprehensive basis for the evaluation of the environment. Development of a design framework which will allow the maximum of complexity and variability to occur within a total pattern is a more desirable and effective approach toward the visual environment than that which now exists.

Chapter I

"It is indeed an age of improved means
to deteriorated ends." (Tolkien)

A problem described again and again in varying terms by writers ranging from urban designers, politicians and outraged citizens is the growing deterioration of the visual environment, particularly in urban areas. Signs, of all types, are primary offenders in this visual chaos as they continue to proliferate with great disregard for order, beauty or human sensibility.

The question of aesthetic standards or visual criteria by which the environment can be assessed has always been a difficult one. However the evidence of the cities illustrates quite clearly that disregard or avoidance of the question leads only to a worsening situation. An attitude often seems to prevail which holds that the subjectivity involved in such judgments means that all subjective judgments have equal value, and therefore standards of aesthetic performance are invalid. This has reinforced the reluctance to impose any type of visual criteria upon the urban environment, and has made any attempts to improve it difficult. To quote John Kenneth Galbraith, "The aesthetic experience was once a very large part of life, unimaginably large, given the values of the industrial system. The traveler from the United States or the industrial cities of Europe or Japan goes each summer to visit the remnants of preindustrial civilizations. That is because Athens, Florence, Venice, Seville, Agra, Kyoto and Samarkand,

though they were infinitely poor by the standards of modern Nagoya, Dusseldorf, Dagenham, Flint or Magnitorgorsk, included as a part of life a much wider aesthetic experience. No city of the post-industrial era is, in consequence, of remotely comparable artistic interest."¹

The primary assumption of this study is that the visual experience of daily life is a vital and important aspect of living; a continuous experience which affect the total response of the individual to living and to the environment. Visual perception is an integral part of learning which shapes understanding and ability to operate within the world. Evidence points to the fact that visual perception also affects psychological and emotional patterns and behavior. Recent studies also strongly indicate that aesthetic satisfaction may be an important need with a physiological basis.²

Value judgments, cultural values, societal patterns; all are partially transmitted through the physical environment which serves to reflect these values and concerns. Our visual life, then, and its richness or poverty are extremely significant; perhaps to a greater degree than has been thought. In the problem of the relationship of the individual to his culture and community, a framework of relevance and significance must exist. That is, chaos, disregard for the values of beauty, proliferation of ugliness and neglect, both reflect and foster attitudes of neglect and unconcern on the part of the individual towards other significant aspects of his society.³ Abse has suggested a relationship between the ugliness of the urban environment and a

kind of collective, unconscious guilt.⁴ The level of concern for the quality of the physical environment reflects the value system of the society, whether or not we wish to interpret it in the Freudian terms of Dr. Abse. Although it would be extremely naive to suggest that improvements to the visual world would be a panacea for all social ills, creating order and beauty in the environment might engender far-reaching consequences. The education of the individual is essential if concern and appreciation for beauty is to become part of the urban environment. "We can therefore predict with some certainty that a child who has been exposed to inferior, unformed and unauthentic pictorial material for many years will inevitably perceive the inferior as normal. On the other hand, if we want to nurture a more exacting norm in the child from the beginning, we must offer him only exacting visual nourishment."⁵

Halprin supports this idea and outlines further dimensions when he says ". . . though we do not have a clear idea of the ideal form of the city, we do have a clear idea of the purpose of an ideal city. This is to make possible a rich and biologically satisfying life for all the city's people. What we are really searching for is a creative process, a constantly changing sequence where people are the generators, their creative abilities are the aim, and the physical elements are the tools."⁶ The question of "biologically satisfying life" which Halprin raises will be discussed in greater detail in Chapter III.

It is felt that a more comprehensive basis for analysis of the

visual environment must be found than that which presently exists. Human needs and response patterns require much more study and consideration by those persons developing planning solutions. Without some knowledge and awareness of the complexities which exists, proposals intended to improve the visual environment cannot be adequate, or more than haphazardly successful. Therefore the purpose of this study is to investigate the relevance of some aspects of psychology as they relate to perception and response. Psychophysical needs as determinants in satisfaction and value will also be examined as being significant to the processes of urban design. This examination is necessarily exploratory in nature as it attempts to relate the concepts and findings of psychology and psychobiology to design principles and planning procedures. The results of this study will then be applied to one element of the visual environment, namely signs.

This study is then an effort to isolate one factor in the visual environment. It is assumed from the onset that signs are a necessary part of the urban environment, but new forms and techniques can be explored. There is a great potential in using signs as positive elements of design in the urban environment. Their scale and temporal nature provide a great range of flexibility which could be used in much more creative ways.

Signs will be analyzed in terms of function, and in terms of their role as design elements in the total pattern. Efforts to control the design of individual signs is not relevant unless they can be related to the total visual context in which they are placed, rather than

considered as isolated elements. It must be clearly stated that in the terms of this examination a sharp distinction exists between the selection of a specific element for cognitive purposes, and the perception and response to the total environment. Therefore, signs are discussed primarily in terms of their subsidiary role in the total visual pattern, rather than as specific and discrete elements, each of which may present unique design problems. The question of designing particular signs is also important, but is a matter for a graphic designer. The relationship between signs and the urban environment is the concern of this study.

Aesthetics:

This is an involved question, dealing with issues which are extremely difficult to define. There will be no attempt within the framework of this study to define a precise statement of aesthetic principles, or to establish a definite guide of artistic standards, nor is such an effort considered to be desirable. However, there will be an effort to present certain theories of need and value, and to relate these issues to signs and the visual environment. The realization that aesthetic concerns are not and cannot be divorced from everyday life is essential to both the quality of our physical surroundings, and the well-being of the individual.

Perception:

The matter of perceptual response and interaction with the visual world is extremely complex, and although research in this area is in

increasing, present knowledge is somewhat limited. It is far beyond the scope of this work to present a detailed analysis of how people respond to various visual stimuli, the relationship between stimuli and response patterns, and the complexity of the total variables involved. Even though it would be very desirable to investigate this question more thoroughly, as it seems to lie at the core of the problem, it is impossible given the present state of research in this area, and within the limits of time and other resources restricting this study. Therefore it must suffice to outline the perceptual process as it is now understood, and as it relates to the problem as it has been defined.

Legality of controls:

The legal questions raised by sign, control by-laws, although significant, lie outside the frame of reference of this study. The legal issue is a complex area of investigation, in which changing attitudes towards aesthetic values and responsibilities are affecting legislative decisions. Unfortunately, although the problems raised are both interesting and pertinent, their very complexity precludes an examination of them within this study.

The hypothesis which has been formulated is that identification, information and advertising signs form a necessary and desirable part of central commercial areas, and that their flexible control in accordance with certain psychophysical needs is a necessary alternative to the present forms of control.

Any examination of signs must first examine some of the fundamental issues. Rather than assume the simple judgments of "visual clutter" and "deterioration of the visual scene" and similar comments of disapprobation, we should try to examine some of the basic facts more closely. The unfortunate aspect of questions regarding aesthetics, and a primary factor in their neglect and dismissal, is the usual equating of aesthetics and personal, subjective taste. Anatol Rapoport comments on ". . . the relativist notions that all values are matters of preference like brands of cigarettes. To be sure, one cannot "prove" the superiority of one set of values over another if one confines one's self to methods of proof appropriate to other inquiries. Nor can one prove by rational analysis that King Lear is a more profound work than Tarzan of the Apes. The conscience-driven thinker will not relinquish the problem of discerning human values simply because the problem does not yield to rational analysis; nor will he divorce any important sphere of human activity from this problem."⁷ That questions of aesthetics have a vital significance for the planning process and that there may be more fundamentally operative processes than simple value judgments will be primary concerns of this investigation.

Footnotes

¹. John Kenneth Galbraith, The New Industrial State. Houghton Mifflin Boston 1967, p. 347.

². D. E. Berlyne, Conflict, Arousal and Curiosity. N.Y. McGraw-Hill, 1960. John R. Platt, "Beauty: Pattern and Change." Functions of Varied Experience. ed. Donald Fiske and S. Maddi. Homewood, Ill. Dorsey Press. 1961.

³. Marya Mannes, New York Times (Dec. 17th, 1961) ". . . foremost among these amenities I would put beauty, convenience, diversity, and solicitude. Their prolonged neglect may well produce a people without amenities, rude, frustrated, snarling, drained or violent. . ."

⁴. Wilfred Abse, "Some Psychologic and Psychoanalytic Aspects of Perception" Perception and Environment: Foundation of Urban Design. ed. Robert Stipe. Chapel Hill, Univ. of North Carolina. 1966. p. 13.

⁵. Wolfgang Metzger, "The Influence of Aesthetic Examples". Sign, Image, Symbol. ed. Gyorgy Kepes. N.Y. Braziller 1966 p. 17.

⁶. Lawrence Halprin, Cities. N.Y. Reinhold 1963 p. 7.

⁷. Anatol Rapoport, "Strategy and Conscience" The Human Dialogue: Perspectives on Communication. ed. Floyd Matson and Ashley Montagu. N.Y. The Free Press 1967 p. 90.

CHAPTER II

The Perceptual Processes

Perception, as defined by Webster, is " 1. consciousness, awareness, 2. awareness of objects or other data through the medium of the senses, 3. process or faculty of perceiving, 4. insight or intuition, as of an abstract quality."¹ The meaning spans a wide range between conscious awareness and intuitive knowledge. Ittelson describes it as a process through which ". . . we come in contact with the world."² Our conscious perception of the physical world is probably more limited than we realize, and our ability to meaningfully communicate about those perceptions even more limited.

Perception, or the awareness of the surrounding world, is based on the information received through the senses, and is often considered to be a natural attribute of every human being. The general assumption that every individual sees the same thing, that the visual world as apprehended through each set of eyes is identical for all is far from true, as can be readily observed when two people attempt to describe the same occurrence. An almost infinite set of variables affects responses and in one sense, creates a unique world for each individual. However, within a particular cultural environment, generally similar responses occur. "Perceiving is always an activity by a unique participant from his unique position, providing him with his own unique world of experiences. To the extent that two persons' positions overlap, including not only their orientations in time and space, but also their interests and purposes, they will tend to have common perceptions and common experiences. And it is these common aspects which make social activity possible."³ There are also suggestions that perception

of the spatial world is far more similar than previously thought.⁴

The general processes of visual perception are expressed diagrammatically in Figure 1. O represents an object or experience existing in the world outside the observer. It may be a single work of art, or a complex pattern of interrelated events. Information about this object is gathered by the sense organs, S. In the case of strictly visual material, only the visual sense is concerned. In most instances a combination of exteroceptors function together. The sensory input is transmitted to the brain, where it is interpreted. This information is affected by the past experience of the observer, which may be labeled E. This experience would include, among many other things, the accumulation of the observer's daily interactions with the environment, geographical location, economic and political background, religious beliefs, friends and level of education.

It is important to note that experience is not a static quality or quantity. Changes occur over time as the individual learns and grows. E is different for every person, and in some slight way, every time. Even though there may be great similarities between past experiences of individuals within a common cultural environment, many differences exist as well.

Interpretation of the sensory input is also affected by factors other than past experience. Intelligence, emotional attitudes, and the state of concentration as well as the physical state of the observer affect perception. The motivation or purpose which exists at the moment, and which directs perception, is also an important variable in selectivity and response. Thus, a complex combination of variables of sensory input, past experience, intelligence, and motivation operate to

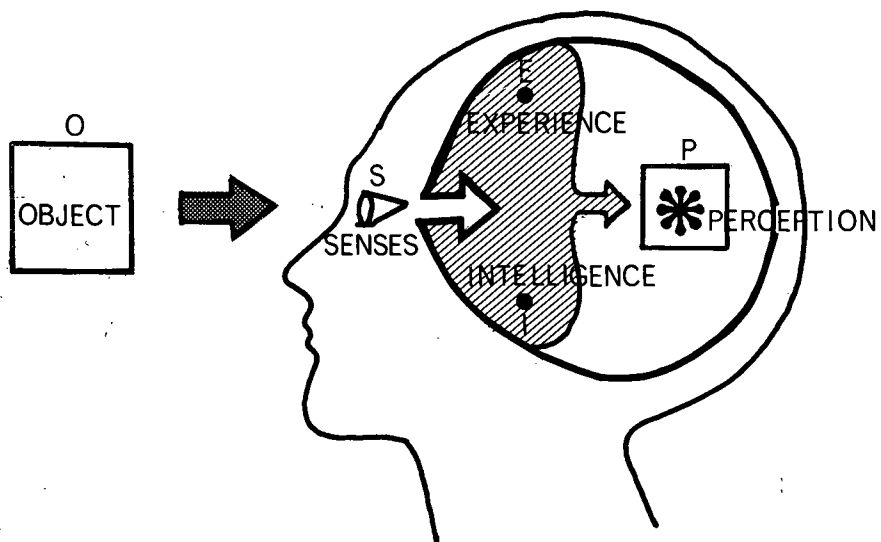


Figure 1. Diagrammatic View of Visual Perception

produce the perception P that was initially stimulated by O.

The elements involved in perception therefore can be loosely grouped into four categories. There are (1) the external world of physical objects and events, (2) the physical senses and physiological state of the observer, (3) a combination of experience, intelligence, and other emotional and psychological factors and (4) responses. Exactly how these elements interact to produce various perceptual patterns is still not precisely known. However, over the years, four basic theories or approaches have been developed.

These may be described as: (1) the theory of innate sensory impressions (nativism), (2) the theory of learning or inference (empiricism), (3) Gestalt theory and (4) the psychophysical approach to visual perception.

Originally visual perception was considered a process in which the act of seeing produced a tiny image on the retina which was the exact replica of the object. This retinal image was then thought to be projected onto the mind, which then "saw" the perceived object. However, the argument about what we really see and what is inferred through the intellect is as old as human thought on perception. Pliny summed up the position in classical antiquity when he wrote that "the mind is the real instrument of sight and observation, the eyes act as a sort of vessel receiving and transmitting the visible portion of the consciousness."

The traditional concept of perception was that the perception of things depended upon first receiving sensations. Nativism assumed that

the synthesis between sensation and perception was intuitive or innate. It was argued that some features of visual space are so immediate and clear to the consciousness that they must be either intuitions which were fundamental to the mind itself or else must be innate elements of the sensations.

In the nineteenth century, in relationship to the changes in other fields where a more scientific and experimental approach was being developed, this previous theory of innate or intuitive perception began to be questioned. While the proponents of the empiricist school also believed that visual sensations were innate, they differed in asserting that all perceptions were the result of learning and past experience.

These two arguments were the basis for the theories which still underlie much of the thinking about perception. However, the nature of this special process on which these theories depend, namely that of synthesis of visual sensations, remained a puzzle. The accepted view is that the percept is never completely determined by the physical stimulus. Instead the percept is something essentially subjective in that it depends on some contribution made by the observer. Sensations are assumed to be basic, and in that they are part of the organic equipment, tend to be similar for all people. Perceptions are assumed to be secondary, and therefore vary from individual to individual depending on personal differences and past experiences.

Towards the beginning of the 20th century, the gestalt psychologists raised objection to the previous theories by taking a new line of thought which asserted that a form was not compounded of sensations

at all. The theory which occurred to them was that the process was one of relatively spontaneous sensory organization.

The basic law of visual perception described by gestalt psychologists asserts that any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the given conditions permit. Perceptual processes tend toward the simplest, most balanced, most regular organization available. Susanne Langer describes it as ". . . a principle naturally inherent in perception itself, which organizes the impinging sensations spontaneously into large units; the tendency to closure of forms, to simplification, known as the gestalt principle."⁵ And in a footnote of extreme understatement, she continues, ". . . the literature of this subject, psychological and philosophical, is too extensive to even be suggested here."⁶

This tendency to closure and simplification of form is thought to be innate in the perspective apparatus of many of the higher mammals. The eye is particularly selective in its reception, favoring those photic factors which the visual apparatus then composes into images. The resulting abstraction of form which is achieved is ". . . probably not made by comparison of several examples . . . nor by repeated impressions reinforcing the engram, but is derived from some single instance under proper conditions of imaginative readiness."⁷ The abstracted form as visualized is then imposed interpretatively on other actualities for as long as it serves its purpose; that is, until further visual information re-structures the abstraction.

The basic principles of gestalt theory as related to visual per-

perception are:

- (1) figure-ground - every perception is a pattern related to a background of other experiences. No figure is perceived in isolation.
- (2) segregation and differentiation - the pattern or stimuli form certain structures in perception owing to their special structures.
- (3) closure - incomplete structure patterns tend to be completed in perception.
- (4) "good" gestalt - one perception will tend to supersede a weaker one based on the same structure pattern; that is, to create a simpler, more organized pattern.

The most basic tenet is that a pattern is perceived directly as a whole, and without synthesis of its parts; a product of an unlearned capacity to perceive "form", "wholeness" and organization". Perception then, develops by the differentiation of a continuum rather than the aggregation of ultimate particles.

Psychophysical theory:

Psychophysics as defined by Fechner is "an exact science of the functional relation of dependency between body and mind." Psychophysics includes both the measurement of sensory attributes and the quantification of perception, in order to correlate these psychological scales with physical measurements of the stimuli. The psychophysical theory of visual perception, as explained by J. J. Gibson, attempts to explain the perception of the visual world in terms of total stimulation; that

is, rather than a process of sensory organization or synthesis which occurs in the mind as a result of learning, or some other process, all properties of the phenomenal world are in a strict one-to-one correspondence with the variables of stimulation. Perceptual experience can be stated as strict psychophysical laws, and the methods of psychophysics are directly applicable to the study of perception. The characteristics of stimulation are not limited to the variables of low order as frequency and intensity (which have been traditionally manipulated in psychophysical experiments). The individual is also sensitive to variables of high-order, e.g. ratios, gradients, and rates. In fact, it is these high-order variables which correspond to the properties of surface and object in the environment, and to which perception is in direct correspondence. These gradients and ratios produce retinal correlates, rather than sensations which are then perceived. The main principles of Gibson's hypothesis are:

- (1) The elementary impressions of the world are those of surface and edge.
- (2) There is always some variable in stimulation which corresponds to a property of the visual world.
- (3) The stimulus variable within the retinal image to which a property of visual space corresponds need only be a correlate of that space, not a copy of it.
- (4) The differentiation of the retinal image can be analyzed by the methods of number theory and modern geometry into a set of variables of physical energy.

Gibson makes an important distinction between two types of perception. The first is the perception of the substantial or spatial world. This provides the fundamental repertory of impressions for all experience, and is the world of colors, textures, surfaces, edges, slopes and interspaces. The second deals with the perception of the world of useful and significant things; of objects, places, people, signals and written symbols. The latter shifts from time to time depending on activities, while the former remains a more or less constant background for experience and a sort of support for maintaining posture and moving about. The world of significant things is too complex to be attended to all at once; consequently, schematic perception tends to be selective.

Literal perception refers to the world of qualities as they appear to attentive observation. This type of perception tends to be very similar for all individuals. ". . . all human beings everywhere, probably see the ground and the sky in the same way."⁸ Gibson points out that the basic perceptual capacities of the human species must be studied before distinctions made in cultural and social terms will be really meaningful. He says ". . . perception is not always or necessarily distorted by needs or affected by purposes. It is not fated to be stereotyped or assimilated to social norms. Misperception is not a consequence of sensory organization, but of the inattention of the perceiver or the weakness of the physical stimulation. It is perfectly true that perception can be fluid, subjective, creative, and inexact, but it can also be literal . . . The student of human

nature and society needs to remember this when he is in danger of assuming that men are the passive victims of their stereotypes and perceptual customs."⁹

Therefore, two distinctions must be made in discussing visual perception. Literal perception, as defined by Gibson, deals with the spatial world, and as such is probably very similar for all humans. However, since seeing is such a fundamental activity, consciousness of the actual process is very difficult. "Only in an unfamiliar environment or a problem situation do we become fully aware of the literal visual world. One has to pause and look in order to see it."¹⁰

Schematic perception, or the apprehension of the symbolic, meaningful world, while still to a large extent an unknown quantity, seems to be the result of learning, past experience, and association. Many cultural, social and individual variables influence this kind of perception.

Some of the variables which must be examined in the discussion of schematic perception are:

- (1) Mental set or attitude - This is a tendency to fit material into existing patterns in the observer's mental life. For example, in psychological experiments the figure of a square can be made to gradually appear on the screen by means of increasing density of light in the projector. If the observer expects to see a square, he is likely to observe the figure earlier than if he had been led to believe that he was going to be shown a circle. The object perceived is being related to the wrong structural

model, therefore comprehension of the true shape is delayed. In other experiments, where the material in a number of exposures formed a sequence of increasing complexity, then a new attitude involving expectation of the direction of development and change occurs, and facilitates perception. When perceived objects are more or less unfamiliar, then the tendency is to perceive them as analogous forms, or to name them, in which case a more conscious process of perception occurs.

Where objects are very complex or strange, there is hesitation and sensory imagery of relevant material may enter the conscious level. The results of a series of experiments by Long, Reid and Henneman¹¹ indicate that the effect of set was increased by the level of visual ambiguity, also that it influences retention and response. Allport¹² defines set more succinctly; "Attitude connotes a neuropsychic state of readiness for mental and physical activity."

- (2) Suggestibility - This is related to set, or attitude. Many of the well-established phenomena of perception, such as various threshold differences, the influence of size, shape and color constancy, phi-phenomenon,^{*} and perception of movement in general are subject to suggestion. However, a suggestion must in some way exploit, activate or utilize a latent impulse in

^{*}the impression of movement between two or more stationary stimuli given successively in time and near each other in space. Basic factor is the stimulation of two retinal points in near succession. (For example, "moving" neon signs exploit this process.)

the individual.¹³

- (3) Motivation or purpose - A motive can be defined as a need or desire coupled with the intention to attain an appropriate goal. While motivation is rarely a simplistic event ". . . it would appear that every activity of the individual can be regarded as governed by one or a combination of four general aims; survival, security, satisfaction and stimulation."¹⁴ These are the basic elements of motivation, although their expression may occur in many diverse and diffuse ways. There is always some purpose, to a greater or lesser degree of strength, directing our behavior. It is this sense of purpose which affects the selectivity of perception. "Motivation affects perceptual sensitivity to certain objects as well as their perceived properties; i.e. food is more readily noticed and looks more appetizing to a man who is hungry than to one who is not."¹⁵ Therefore, how we select what we see and how we see it is strongly affected by the particular motivations and their relative strengths which are operative at any given time.*

*Franklin Fearing ("A Psychological Theory", The Human Dialogue) discusses the structuring process in perception. "The important dynamic fact is how the person perceives the situation and what he wants in it . . . are the significant factors . . . rather than the fact that learning had previously taken place." In addition, ". . . we believe that new insights do arise, and we see no good reason why novel features of current situation should not be perceived or why previously unnoticed features of repeatedly experienced situations may not be perceived for the first time." p. 183.

(4) Projection -

Perception is affected by sensitivity to minute modes of behavior or qualities often imperceptible to the self. Various attitudes or intentions favorable or inimical to the self are perceived in other persons or situations; often these are simply characteristic of the individual's own personality. Projection is most apparent when dealing with inchoate material.¹⁶ There is every reason to believe that some projective qualities enter into a great proportion of apparently ordinary perception.¹⁷

(5) Subthreshold stimulation -

The possibility exists that stimuli presented below the threshold for conscious experience may influence feeling, perception or behavior. One method of introducing subthreshold stimulation is to project visual messages or patterns of such low energy that they are consciously imperceptible. Conscious thresholds for individuals vary widely, and are subject to considerable change. Verbal responses to words presented below the threshold of awareness tend to be symbolic associations to these stimulus words. More correct guesses are given for the word which has greater emotional value. The threshold for conscious perception is a fluctuating range rather than a precise and constant limit, and much ordinary, conscious perception is undoubtedly affected by many unconscious factors, both internal and on the stimulus side.¹⁸ Ehrenzweig also expresses the same

thought ". . . it must be stressed, however, that this function is at the conscious level of seeing, and does not describe physiognomic or symbolic seeing. Unconscious perception of form can still affect the total reaction to a visual stimuli. Why should form combinations which remain invisible to conscious perception still exert such an influence on the general appearance of a design? If they have an influence at all they must also have visual existence. If they are not consciously perceived, they are perceived at least unconsciously."¹⁹

Therefore, perception is a dynamic process, influenced both by built-in physiological factors and by cultural and social determinants. For the most part, research has taken place in laboratory situations where variables and stimuli can be controlled and regulated. While this methodology is necessary in order to determine results precisely and with some validity, it must be remembered that perception never occurs independently of some other activity. This means it can never be studied except as part of the situation in which it takes place. "The starting point for perceptual studies must always be perceiving as it is encountered in concrete real-life situations. The student of perception is frequently forced to obtain data under conditions remote from those in which perception normally operates, but he must always be sensitive to the limitations of attempting to treat such data as if they had relevance to real life situations."²⁰

The conclusions reached in controlled laboratory experiments may not be directly transferable to the infinitely more complex visual

environment presented by the urban environment. However, in attempting to propose changes or create improvement, or even to analyze the problems of the existing environment, it seems essential that a basic understanding of some of the elemental processes of visual perception be reached.

The theories of perception which have been presented seem to indicate that:

- (1) The mind-body dualism of the earlier theories (nativism, empiricism) of perception do not seem adequate to explain the processes by which the individual actively perceives his environment. The simplistic division of sensation (body) and perception (mind) is increasingly inadequate as more research is done in the fields of neurophysiology and psychology which indicates an isomorphic relationship, rather than a duality.
- (2) Literal perception; that is, perception of the spatial, substantial world appears to be a basic physical ability of the organism, and is similar for all individuals. However, this rarely operates at a conscious level, except when the visual environment present too many ambiguous clues.
- (3) Schematic perception, or the perception of the symbolic, meaningful world of objects and people would seem to be dependent upon a vast number of variables. Learning and association play very important roles, as this type of perception is predominantly affected by cultural and social factors.

- (4) Perception cannot be adequately tested in a laboratory situation. Controlled testing is useful and necessary however, in order to understand the basic factors. Responses to the total environment are very complex and direct application of laboratory finds may not be valid, although they may indicate certain significant elements in the way visual perception operates.

Increasing attention is being given to the relationship between urban design and the behavioral sciences. Studer and Stea²¹, for example, assert that behavioral needs provide the only reasonable basis for design and that problems in design are meaningful only when formulated in behavioral terms. A.E. Parr²² suggests the problem should be approached from two directions: (1) psychological studies of the mental and emotional needs which environmental design should attempt to meet, and (2) behavioral observations of the responses to actual environments. Methods suggested are in part subject-controlled speed of simulated progress through environmental facsimiles created by film or other methods, or automatic recording of attention span in simulated versions of the real environment as well as investigating the personality characteristics of the subjects.

The questions of methodology constitute the major problem in the applicability of behavioral testing. However several studies have attempted to apply standard cognitive testing techniques in order to bring these objective research methods into the complex

field of perception analysis. Cyril Herrmann²³ has reported on an experiment which tries to develop a new research method for studying human reaction to the urban freeway, with particular emphasis given to the roadside environment. Subjects were shown a series of slides in sequence to facilitate the sense of actual participation in the environment. This series of slides contained certain elements (billboards, utility poles, signs) which were progressively eliminated. By using an eye-movement camera, an accurate measure of focus and eye attention span was obtained from each viewer. After viewing the series of slides, the subject evaluated them on a bi-polar adjective scale. The Barron-Welsh creative personality scale as well as questionnaires and interviews were used in order to assess the personality characteristics of the subjects. The results of this test were reported as: (1) attitudinal characteristics of the observer are more important in his evaluation than were demographic characteristics although amount of education showed some correlation. (2) lack of agreement existed among subjects regarding order of importance of urban problems such as air pollution, lack of planning, traffic congestion, billboards, etc. "This suggests that it would be very difficult to develop a priority system to match expectations of all individuals."²⁴

(3) Observer response to the effect of billboards in the environment depends on the nature of the environment itself. The majority of those who had expressed greatest reactions against billboards did not notice when the billboards were removed from the stimulus. Removal of the utility poles tended to increase eye fixation of billboards

and other signs. (4) When the three object groups (utility poles, billboards, signs) were removed from the stimuli, "most observers noticed a difference and some were surprised to find they did not like the resulting environment as well as they thought they might."²⁵

Herrmann concludes with two observations. "It has been possible to effectively work on a complex problem of urban visual environment under controlled laboratory conditions; and the synthesis of several research methods on the problem of human response to the urban roadside has produced some new and interesting insights at both the theoretical and practical level."²⁶

In another experiment carried out at Harvard by F. Vigier, the immediate purpose was to test whether the methodologies previously developed to isolate specific factors which contribute to primitive form perception could be adapted to more complex real situations. The hypothesis put forward asserted that responses to an urban situation would occur in a manner similar to those aroused by other complex situations; that is, a pattern of attention shifting among specific aspects of the stimulus as well as among perception proper, (Vigier defines as "the search for cues") and action oriented behavior.

Subjects were selected from both design and non-design backgrounds, and viewed a tachistoscopic presentation of wide-angle photographs of Boston streets. A report was made by each subject after each exposure and analyzed from the following aspects: (1) density of response (2) saturation (3) ambiguity.

Vigier reached the following conclusions. (1) the sequential nature of perception was confirmed in a complex real-life situation, (2) the perceptual organization of an urban environment seems to be the result of combinative responses to stimuli and (3) recognition patterns seem to be initiated by specific elements whose emergence results from their particular spatial relationship to an array rather than because of any intrinsic characteristic.

The need for further research in order to arrive at a better understanding of ambiguity is emphasized by Vigier, as he questions ". . . the effectiveness and legibility of a minutely designed environment" and suggests it is ". . . doubtful—at least in relation to the observer's desire to be informed about its function, quickly and efficiently."²⁷

Another conclusion was that improved research techniques need to be developed. "The experiment described in this paper is exceedingly primitive: its presentation was static, monochromatic, only approximated the normal field of vision, and ignored such environmental clues as noise, odors, and temperature variables. That it yielded credible results was not only rewarding but suggested the possibility of several technical improvements."²⁸

These studies serve as examples to indicate that a strong relationship between perception, response and the visual environment does exist, and also illustrates the definite potential for applying behavioral science research techniques to the further examination of the problem.

Footnotes: Chapter II

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⁷Ibid., p. 165.

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¹¹E. F. Long, L. S. Reid and R. H. Henneman, "An Experimental Analysis of Set: Variables Influencing the Identification of Ambiguous Visual Stimulus-Objects", Amer. J. Psych., 73 1960, p. 554.

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¹³G. M. Wyburn, R.W. Pickford and R. J. Hirst, Human Senses and Perception, Edinburgh, Oliver & Boyd, 1964, p. 210.

¹⁴David Krech and Richard Crutchfield, Elements of Psychology, N.Y. Knoph, 1958, p. 278.

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¹⁶Wyburn, Pickford and Hirst, p. 225.

¹⁷Ibid., p. 226.

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¹⁹Anton Ehrenzweig, The Psychoanalysis of Artistic Vision and Hearing, N.Y. George Braziller, 1953, p. 23.

²⁰Ittelson and Cantril, p. 209.

²¹Raymond Studer and David Stea, "Architectural Programming and Human Behavior" Journal of Social Issues XXII, 4 (Oct. 1966, pp. 127-136).

²²A. E. Parr, "Psychological Aspects of Urbanology" Journal of Social Issues XXII, 4 (Oct. 1966).

²³Cyril Herrmann, "Using Research Experimentation to Improve the Urban Environment", Junkyards, Geraniums and Juriprudence: Aesthetics and the Law. American Bar Association Nat'l. Institute. Chicago, June 1967, p.

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²⁵Ibid., p.

²⁶Ibid., p. 262.

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Chapter III

Aesthetics

The study of aesthetics, like that of perception, presents us first with a bewildering array of theories, definitions and arguments. For the most part, the simplest answer remains that of assuming questions of aesthetic judgment are merely matters of personal taste, and dismissed as having little relevance to the more practical and serious matters of everyday life. While it is obvious that the question of values does enter into the discussion of aesthetics, it is often not as obvious that values enter just as much into many other aspects of life and study. However, ". . . it is still current practice to distinguish aesthetics and ethics as 'normative' sciences dealing with values, from descriptive sciences dealing with facts. This antithesis obviously suggests that values are not facts, but some strange sort of entities apart from the natural order of things."¹

Scientists are coming to recognize their limitations, however, and to describe dynamic processes, rather than objective "facts". To further quote Munro, "Objectivity has come to signify a relative and practical measure of how far a belief has ceased to be merely individual and ephemeral, and has grown to represent the tested experience of humanity. There is no sharp line between 'laws' which possess this quality, and 'theories' which do not, but there is a gradual degree in difference. There is no field of discussion, including aesthetics, in which the reliability of theories cannot be gradually increased through the systematic testing and revising in the light of new experience."²

The importance of aesthetics is being re-examined, and the studies of social scientists are adding weight to the voices of those who have long expressed concern for the quality of the environment. It will be the intent of this chapter to (1) give a general definition of aesthetics, (2) describe the studies which indicate a need on the part of the individual and (3) illustrate the relevance of these investigations to urban design. In a later chapter, it will be attempted to apply these concepts specifically to a small element of the total urban design, namely, signs.

As was pointed out in the previous chapter on perception, many factors interact to produce the final perception, and to elicit the complex response from the individual. This is a dynamic process, continuing in time and space, and is constructed of a complex inter-relationship of physiological and cultural factors. To a large degree, the same thing can be said of aesthetics. Aesthetics has been defined as ". . . the subject which seeks to describe and explain, in a broadly theoretical way, the arts and related types of behavior and experience."³ It also covers the philosophical areas of art criticism, of the psychology of art, the sociology and ethnology of art, and of all other subjects touching upon the arts. The outer boundaries of aesthetics are indefinite, but its central core consists of theoretical studies which select, coordinate, and interpret relevant facts and hypothesis from all sources about works of art and those who make, perform and use them.

However, most critics agree that art has two aspects, a formal aspect and a representational aspect. The satisfactions derived from representational elements in art are perhaps easy to understand, as they resemble moments of heightened awareness, and present them in more or less explicit forms. The satisfactions created by the formal elements in art, whether it be painting, music, poetry or design are not as accessible to understanding. The formal elements are concerned with time and space patterns and deviations from them; that is, diversity in order within a temporal and spatial framework.

This problem has recently begun to be examined from two aspects; first from the side of aesthetic analysis, particularly in the field of musical aesthetics, assisted by some general ideas from information theory: secondly, from the side of biophysics or the physics of perception. "It now appears that the requirements for aesthetic enjoyment are simply the requirements for perception itself, raised to a higher degree; and the essential thing in each case is to have a pattern that contains the unexpected." This seems to be the heart of what we call beautiful, and it is no exaggeration to say that men need it as they need food."⁴

The basic outline of this argument rests on two neuro-psychological principles: the principle of response to novelty or change-in-stimulation, and the principle of response to repetition or pattern. Thus the paradox exists that the human response system demands new information or novelty, and yet at the same time demands regularity or pattern. Unpatterned stimulation is equivalent to "noise" and yet

continuous sameness of pattern stimulation leads to boredom, and in extreme cases of stimulus deprivation, to hallucinations, nervous reactions, and even psychopathic behavior.

That these two principles have an organic basis is illustrated by Platt,⁵ and supported by such scholars as D. E. Berlyne,⁶ James Bieri⁷ and W. W. Grey,⁸ as well as indirectly by Koestler,⁹ Arnheim¹⁰ and Vigier.¹¹ Platt asserts that the brain is an organ designed for the rapid and complete processing of information. At the same time, the perceptual system is designed to detect fluctuating inputs, rather than steady inputs, and in fact is designed to produce such fluctuations, (see J. J. Gibson, Perception of the Visual World, pp. 17-23; also "Stabilized Images on the Retina", Roy Pritchard.) Therefore, the nervous system oscillates, or scans for information; that is, for the variable, the contrasting and unexpected. "It tracks down the unexpected; and if none is to be had, perhaps it invents it".¹² Platt maintains that his demand for diversity is the simplest way to summarize the meaning of curiosity and attention and boredom, and of the aberrations and hallucinations of the stimulus-deprivation experiments, ". . . the mind seeks to escape from the certainties of the diffuse light that remains during stimulus deprivation. It is bored by the certainties of any humdrum job or routine entertainment. It seeks out the single moving spot on the landscape or the tiny squeak in the engine. It plays the slot machine to exhaustion, hoping for the rare and unpredictable payoff when three lemons turn up. What it seeks in the variable light signals, and what it processes and

responds to on all levels, is information - the changing, the novel, the surprising, and the uncertain."¹²

However, any many-element receptor (such as the brain which has on the order of 10^9 input channels from all the senses) must of necessity be a pattern-selecting or pattern-perceiving system. Therefore, in addition to the diversity or variation required, it is necessary for the diversity to occur within perceivable patterns. Extremes of either sameness or multiplicity lead to an inability on the part of the observer to adequately respond to the stimuli. The limits, or threshold levels on either end of the scale quite naturally vary from individual to individual. For example, the Barron-Welsh Scale was devised to test preferential behavior for simple-complex figures. Results indicate that individuals judged to be more "creative" prefer complex-asymmetrical figures, while those subjects judged to be more conservative and conventional preferred simple-symmetrical figures. However, in tests such as these the effects of learning as well as underlying personality characteristics remain variables. These individual variances, however, do not disagree with the basic argument, which is that certain physical needs for varying degrees of complexity and ambiguity exist in conjunction with the need for perceivable patterns.

Rapoport and Kantor support this by pointing out that ". . . this preference for the complex and ambiguous is not limitless. Both McReynolds and Kessen-Munsinger noted that every person prefers only a certain degree of perceptual input, a degree with which he can cope.

Stimuli which are too simple lead to quick boredom; those which are too complex lead to confusion and avoidance. This suggests the idea that for each person there is an optimal perceptual rate."¹³ However, despite small individual differences, there appears to be ". . . a consensual point of visual preference among humans as opposed to a random scatter among individuals."¹⁴ The limits of stimuli in terms of urban environments remains difficult to quantify, and would require further research.

How do these needs relate to feelings of satisfaction or pleasure which seem to be inextricably joined to "aesthetics"? The basic role of patterns in our visual perception is related to this matter. Platt advances a theory to explain the process by which the individual can make the precise and accurate pattern comparisons which occur in perception. This involves moving the eye over a field and comparing the signals received at one time with those received at another. If a set of signals is the same after a particular rotation of the eye, this indicates that there is some pattern in the external field which is congruent to itself. The brain can then perceive such a pattern as it can compare the "sameness" of the array or signals before and after the visual displacement which occurs in eye movement. Congruence is also possible in the time dimension, as any space or sound array which is repeated after an interval or periodically is self-congruent in time. The two main points which emerge from this theory are that: (1) time and space fluctuations of input stimuli are probably necessary in order to perceive patterns, and (2) the brain

preferentially selects as unique just those few pattern elements that have the self-congruence property in time or space.*

These principles can then be extended from the area of perception to that of appreciation. There is a physiological component in all satisfaction; that is, one can't enjoy anything with a stomachache. As the brain is a physiological organ which is employed in the acquisition and ordering of new information, a process which reaches far back into the evolutionary behavior, it is difficult to believe it should not have strong affective overtones in every day life. The functional satisfaction of this large organ doing its job may be a major element in our feelings of pleasure and aesthetic satisfaction. "If this is so, then at the root of enjoyment must lie the same factors that perception itself depends upon. If fluctuations are basic to perception, we may suspect that they will play a large role in enjoyment. If the self-congruent patterns are basic for perception, we may suspect they will be basic for enjoyment. And perhaps a combination of the two, a flux in which we can find a pattern, or a pattern in which we can find unexpected fluctuations will give the

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Walter Grey, in "Activity Patterns in the Human Brain (Aspects of Form) pp. 174-195, supports the theory that visual stimulus patterns are associated with feelings of pleasure and pain, in a discussion of theta rhythms. These are patterns of electrical activity with rhythmic discharge of about 6 per second. "It is not markedly responsive to visual pattern, but is associated in some delicate fashion with pleasure and pain." There is also a correlation between profound subjective impressions and attitudes with electrical discharge. "Flickering light stimuli of high intensity show that visual stimulation at the frequency of a theta rhythm evokes a feeling of annoyance and frustration even when no stimulus with emotional content is present. When emotional aggravation is added to the theta flicker, 2 effects summate, producing a transient psychopathic reaction. There is evidence of an intimate relationship between thought patterns and living processes as well as between the visual receiving areas of the brain and some other regions less easily specified." p. 188-89.

greatest pleasure of all. The child is pleased and laughs when in his random scanning up and down a line he discovers straightness, or in his manipulation of the block, he discovers that it just fits the hole in the box. Perhaps the intellectual satisfaction of the adult has the same roots. This could help us understand why all the students in a mathematics class are pleased by an elegant proof, a proof that uses the full reasoning and inductive powers of the brain to discover a new order in a maze of complexity."¹⁵

Berlyne¹⁶ in a discussion of aesthetic theory also suggests that the two principal variables are complexity and order. Complexity is closely related to the effort of attention and the consequent feeling of tension which an object elicits. Order is related to certain properties of the object such as symmetry, repetition, and sequence in time and space. He conjectures that complexity and diversity excite through some form of conflict, which is defined as ". . . visual tension between opposing or contrasting lines, direction, shapes, space intervals, textures, values, hues . . . also called opposition, contrast, or variety, and is used to produce stimulus or interest."¹⁷ In addition, unity, demands that the conflict be resolved and integrated by dominance, which is effected by subordinating the competing visual attractions to an idea or plan or orderly arrangement. Thus dominance is achieved when one quality - color, line, or space - occupies appreciably more of a design than others.

Dominance is analogous to order, and as such is related to the concepts of Gestalt, "closure" and "good Gestalt". Ehrenzweig describes a good gestalt as being characterized by brevity, simplicity, neatness and roundness.¹⁸ Arnheim explains it as that organization of material with the smallest possible number of structural features, as well as being related to the balance of the elements, their arrangement and their nature.¹⁹

"We thus find aestheticians arriving at a view that parallels the one to which our inquiry into simpler exploratory behavior has led us: departing too far from an intermediate degree of arousal potential, upsetting the balance between the factors that raise arousal and the factors that allay arousal, results in discomfort. Since the pursuit of aesthetic enjoyment means deliberately seeking out stimulation and excitement, we must suspect that a mechanism of the arousal-jag type is in operation. This means there must be some way of ensuring that arousal is kept within bounds and that it is speedily brought down again, a requirement fulfilled by the order or organization element."²⁰

As already indicated, the preference and need for complexity in the environment has been the subject of much psychological research. However, most studies of urban design have stressed simplicity and clarity, overemphasizing order, perhaps, at the cost of ambiguity. A paper done by Rapoport and Kantor²¹ summarizes much of the work done in psychology, and attempts to relate it to the field of urban design. Their conclusions support the hypothesis that ". . . ambiguity and

complexity are important components of a visually 'good' environment because they help to achieve an optimal perceptual rate which is related to richness and complexity of perceptual input, and . . . that visual satisfaction is an important aspect of life."²² By creating ambiguous visual environments in which the observer is invited to participate, to create and find resolution, both monotony and chaos can be avoided. Therefore, contradictory relationships of form and space, or of meaning, give tension and vitality to a design. Elements should be combined so that place can become "multi-suggestive".

This need for diversity suggests that it is impossible and undesirable to design a total environment. Rather the environment must be open-ended, unfinished to a degree, so that the necessary completions which will be the expression of many different people will result in a degree of diversity, complexity and interest which is not possible through conscious design.

This concept of individual involvement in the perceptual completion of visual stimulation is related to McLuhan's concept of "hot" and "cool" media. ". . . cool media are high in participation or completion by the audience."²³ A situation which provides very little visual information has low definition, i.e. is "cool". The real meaning of perceptual inputs is the change which they produce in the image. Consequently, concern with effect rather than meaning is the result of involvement, for effect involves the total situation rather than a single level of information movement.

Perceptual and intellectual activities have many indispensable contributions to make to the preservation of life, and to the gratification of biological needs. They help in the guidance of more or less any response that acts on the outside environment, and they can thus be influenced by any of the more familiar and obvious sources of motivation. There are however, cases in which perceptual and intellectual activities are engaged in for their own sake, and not simply as aids to the solution of practical problems. This suggests that perceptual and intellectual activities can draw on special sources of motivation that are peculiar to themselves. The result is what can be classified as play, or to use a more comprehensive term, ludic behavior. In human beings, ludic behavior includes everything that is classified as recreation, entertainment or idle curiosity, as well as art, philosophy and pure science. "To gauge the strength of the motivations to which these activities respond, one has only to think of the immense industries that have grown up to cater to them, and consider the economic resources that are devoted to them by advanced societies, i.e. those that have self-preservative behavior most firmly under control."²⁴

Ludic behavior consists in large measure of seeking out particular kinds of external freedom. As defined by Huizinga, the primary element of ludic behavior is freedom; freedom from the ordinary demands of life both in the sense of time and content.²⁵ "It adorns life, amplifies it and is to that extent a necessity both for the individual - as a life

function - and for society by reason of the meaning it contains, its significance, its expressive value, its spiritual and social associations, in short, as a culture function."²⁶

Although many theories have been advanced regarding the function of ludic behavior, none have yet comprehensively defined it. Theories range from the supposition that it improves the organism's ability to cope with future contingencies; it keeps the body's equipment in trim by providing exercise, it gives parts of that equipment rest by bringing other parts into play, or it furnishes skills or knowledge that may prove serviceable on later occasions. Perhaps it can best be defined as any behavior that does not have a biological function that we can clearly recognize.²⁷ Regardless of how it is defined, play and the need for it exist in the human being as well as in animals. Environmental design theories which attempt to relate the studies of behavioral sciences to the everyday environment in terms of stimulus and response would do well to consider there are behavior patterns and responses which may not have a direct stimulus-response correlation. Other motivations and drives in addition to those simplistic ones of reducing tension and conflict may well function within the organism, although they may not be readily accessible for analysis and study. Thus, ludic behavior and the need for complexity and ambiguity within the environment may have a functional relationship within the physiological organization of the individual, and an urban environment which permits and encourages greater participation may be more satisfying than that which does not. The play element in culture is a fascinating

one which has received relatively little study, and yet there is evidence that it exists as one of the basic human impulses. How this relates to urban design and environmental needs would be a rewarding area of study.

Symbolic Content

In addition to the physiological needs of the individual for pattern and change in the environment, there is the vast area of symbolic content. This too, is inextricably mixed with our perceptual processes and response patterns in a complex chain of interaction. "Man's existence and functioning as an organism depends upon recognition and response not only to biological signals, but also to this wide array of signs which he learns to interpret and perceive."²⁸ Robert Katz²⁹ states that the central task of the social and behavioral sciences in the study of the environment is to ". . . relate the stimulus properties of the symbolic environments that men create." For one of the essential qualities of man is ". . . to symbolize everything that happens to him, and then to react to the symbols as if they were actual environmental stimuli."³⁰ Thus the visual environment of the city becomes a significant factor in the daily lives of the inhabitants. In a myriad of subtle ways, the physical configurations of the environment are perceived and interpreted and translated into organic processes. The individual reacts not only to the specific stimulus itself, but also to all symbols associated with the experiences of the past and expectations of the future. In a sense, man lives by metaphor.

In this sense, the city itself functions as an artifact, as a symbol; particularly in our present culture in which increasing urbanization and advances in technology create a more and more abstract condition of life. The city then functions in three major ways: (1) a background against which individuals conduct daily lives, (2) a very profound symbol of what, who, and how the individual conducts his life (identity), and (3) a protagonist in the drama of life (involvement and participation). Therefore, a city must be examined not only physically, but also as a concept, or symbolically.³¹

The city then functions as an experiential force. Identification and memory play large roles in the perception and meaning of the city. Many perceptions afford sensuous pleasures largely as they recall past gratifications. "More often they do not recall the past, but have a symbolic reference to past experiences and phantasies which remain unconscious. Yet they arouse through their symbolic reference strongly pleasurable feelings."³² Identification with the environment is also related to symbolic meaning. "It has a marked influence upon people's development and taste. The surroundings in which they are brought up is what they regard as part of themselves."³³ In addition, "we experience cities both in concept and in actuality, and both vicariously and indirectly."³⁴ That is, the influence of images of other cities, historical, imaginary or others that we have experienced affect the concept of city we possess and consequently, our experience of any actual urban environment.

The symbolic content of any environment is to a large degree

culturally determined, and for the most part, these elements operate on such a basic level that conscious awareness of them does not exist. However, it is these symbolic, culturally derived meanings which provide the threads of continuity in our environment. "Individual persons and social groups are human because of their symbol systems and yet these symbols impose in turn heavy burdens on individual and social action."³⁵ Man's rich symbolic life is expressed in all his actions, signs and values. Attention must be given to these manifestations if the physical environment is to reflect the human reality.

Given that an environment has both a physiological and symbolic impact on an individual, and that the entire process of living and working within an environment is a dynamic, transactional one, certain implications for the aesthetic quality of the urban environment seem clear. These may be broadly described as:

- (1) Pattern and diversity appear to be primary physiological needs of the organism. These properties are basic elements in design, and their balance determines the degree of satisfaction which is obtained. Individual differences and preferences occur, but only in a matter of degree. Complexity and order are therefore both basic needs of the organism, and basic elements of design. These elements exist in both space and time.
- (2) The symbolic qualities of the environment, that is, the meaning and value which the individual applies to his surroundings become operative as though they were actual properties of the object

itself. Strictly behavioral studies are not adequate measures of the qualitative value of stimuli. Man's ability for abstract thought makes it possible for experience to occur simultaneously on more than one level; consequently a multiplicity of responses may occur on various levels. Symbolic responses involve conditioning and learning which is the consequence of a particular cultural context. Therefore patterning will be similar for any one cultural group, while cross-cultural responses may not be.

- (3) The level of quality of the environment is assessed and valued in direct proportion to the degree of participation which is possible for the individual. This relates to both the previous categories of physiological factors and symbolic needs. Perceptual participation occurs to the degree that the need for complexity and order are satisfied. Somewhat ambiguous visual surroundings encourage greater participation on the part of the observer. Symbolic and emotional needs are gratified to the extent that the physical environment reflects the social meaning and cultural norms of the participants. This however is a reciprocal process, and physical changes affect the meaning and values of a society. There must exist, however, a common meeting ground of meaning in order for this type of exchange to occur.

If we accept the previous arguments concerning the relationship of physiological and psychological needs and cultural factors, we must ask how they apply to specific issues. A general framework of perception

and aesthetics has been laid down in these chapters; we will now proceed to an examination of one small, but important element in the urban environment and attempt to analyze its function and effective utilization in terms of the preceding material. Because of their particular qualities, both commercial and informational, offer unique possibilities for both enhancing and defacing the urban environment. Chapter IV will examine some of these potentials.

Footnotes: Chapter III

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¹⁰Rudolph Arnheim, Art and Visual Perception, U. of Cal. Press, 1966.

¹¹Francoise Vigier, "An Experimental Approach to Urban Design", AIP Journal XXXI, 1 (Feb. 1965).

¹²R. Held, "Exposure-History as a Factor in Maintaining Stability of Perception and Co-ordination", J. Nerv. Ment., 1961, 132 26-32 quoted by J. R. Platt, p. 409.

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¹³Amos Rapoport and Robert E. Kantor, "Complexity and Ambiguity in Environmental Design", AIP Journal, (July, 1967) p. 214.

¹⁴Ibid., p. 215.

¹⁵Platt, p. 418.

- ¹⁶Berlyne, p. 228.
- ¹⁷Ibid., p. 233.
- ¹⁸Ehrenzweig, p.
- ¹⁹Arnheim, p. 17.
- ²⁰Berlyne, p. 133.
- ²¹Rapoport and Kantor, p. 216.
- ²²Ibid., p. 217.
- ²³Marshall McLuhan, Understanding Media: The Extensions of Man N.Y. McGraw-Hill, 1965.
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- ²⁶Ibid., p. 9.
- ²⁷Berlyne, p. 5.
- ²⁸Lawrence Frank, "The World as a Communication Network", Sign, Image, Symbol, ed. G. Kepes, N.Y. Braziller, 1966, p. 8.
- ²⁹Robert Katz, "Stimulus and Symbol: The View from the Bridge", Jour of Soc Issues XXII, 4 (Oct. 1966) p. 22.
- ³⁰Rene DuBois, Man Adapting, quoted by Robert Katz, p. 22-23.
- ³¹Barclay Jones "Prolegomena to a Study of the Aesthetic Effect of Cities", JAAC XVIII, 4 (June, 1960) p. 421.
- ³²Wilfred D. Abse, "Some Psychologic and Psychoanalytic Aspects of Perception", Perception and Environment: Foundations of Urban Design, ed. Robert Stipes, U. of North Carolina, Chapel Hill, 1966, p. 15.
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- ³⁴Jones, p. 429.
- ³⁵Charles Morris, Signification and Significance, Cambridge MIT Press, 1964, p. 64.

Chapter IV

Significant Factors in
Responses to the Visual Environment

A summary of the preceding pages raises more questions perhaps, than it supplies answers. This is inevitable in any study of an exploratory nature, particularly when there is an attempt to relate the concepts and findings of one or more distinct fields to another discipline. City planning is admittedly an amalgam of many areas of study; however, the behavioral sciences have been largely ignored to date. Until very recently, urban design has followed the traditional patterns based upon abstract architectural concepts. That is, most developments were treated as "design" projects rather than environments for people with specific needs and wants. That these needs and wants existed, and could be described in other than subjective terms is a relatively recent approach, and the application of these ideas to planning is still in a very tentative stage.

This study is then an attempt at bridge-building. The gap which separates planning from knowledge in other fields, primarily psychology, can only be detrimental to the projects and goals devised by planners. It seems critical to understand the relevance of much of this research, and to attempt to apply it to the complicated field of urban design. As urbanization increases, ever-growing numbers of people are living in man-made "designed" environments. That these environments are inadequately designed is obvious to anyone who stops to examine present problems; however, alternatives are not always as obvious. The planner must take his head out of the sand of nineteenth century assumptions of human needs and desires, and take a long and unbiased look at the regions

which the psychologists and others have been exploring, and learn to recognize the total interaction of environmental forces.

Creating an optimum environment requires a much better understanding of the needs of man than presently exists. Research findings have identified relationships between the physical environment and human performance, and established that physiological health and psychological well-being are affected by environmental variables. Social behavior is also influenced by elements of the physical environment. However, much still remains to be done in giving design interpretation to these many physiological and psychological factors.

Consequently, before any conclusive criteria can be reached about the re-designing of the environment, much research must be done at a fundamental level. As yet little concrete information exists regarding specific elements, techniques, and relationships which would provide the optimal response. Most experimental data comes from laboratory environments, and require much more testing in actual, or more realistically stimulated situations. Learning and affective behavior in normal urban situations needs to be considered, as does the complicated area of methodology and testing which is involved. Therefore, at this point it seems more valid to attempt to formulate certain questions regarding these issues than to set down definite criteria for design. Certain general concepts seem to emerge from the research which has been done, and these will be pursued in the hope of defining questions for further study.

Perception:

After examining the evidence, we can agree that while visual perception

in its literal aspects is probably similar for all normal individuals, perception of the meaningful world is affected by a multitude of variables. Selection and interpretation of visual material depends upon a wide range of personal experience, learning and motivation. However, there also appear to be broad similarities within any given social context. Therefore, it is not quite true to say that everyone sees things "differently". While individual differences do in fact exist, broad basic similarities occur within any given culture. Factors of motivation appear to be major elements in perception of actual situations where orientation and location become operative concerns.

Aesthetics:

The question of a "satisfying" visual environment has also been raised. This is separate, although related, to the selection of stimuli which occurs in the perceptual process. For example, those visual experiences which are more satisfying to the individual may be selected over those which are not; however, when information-seeking is the primary motive, the satisfaction gained from any particular visual clue may not be an operative factor.

In addition, the need for order and complexity seem to be inherent in our physiological equipment. This relationship between pattern and diversity is also basic to all laws of formal aesthetics, and indeed to all that man considers beautiful. Proust has referred to that ". . . ordered complexity, that is to say, beauty." It is suggested that the degree to which something is considered to be "beautiful" is directly

related to the degree to which it meets the requirements of complexity within order, and consequently satisfies the neurophysical needs of the organism. The degree of order and complexity which can be perceived in any situation must vary from individual to individual, but the basic drive remains a common factor.

The concept of order is also related to scale. The laws of cosmic order are relatively inaccessible to most individuals however much scientists may extol their beauties. The environment then, must relate sufficiently to the scale of the individual to allow him to comprehend its total form and its more intricate parts. This may occur in experience over time, and thus experienced will in fact, probably be more rewarding than if all information regarding the total pattern were immediately available.

Also, a balance between order and complexity is needed, for complexity carried too far, or an undiscernible order, is equivalent to chaos. The apparent formlessness will be as devoid of meaning as the opposite pole of sameness. An environment may be so complex as to create an early saturation and frustration in the viewer. One might speak of the monotony of chaos as well as the monotony of identity.

Curiosity and exploratory behavior seem to be basic drives in the human as well as in other animals. Koestler sums it up by saying ". . . The exploratory drive is now recognized by the younger generation of animal psychologists to be a primary instinct, as basic as the instincts of hunger and sex; it can on occasion be even more powerful than these. Countless experimenters - starting with Darwin himself - have shown that curiosity, and the seeking out of 'thrills', is an

instinctual urge in rats, birds, dolphins, chimpanzees, and man; and so is what Behaviorists call 'ludic behavior'".¹ Satisfaction of these drives is a requisite to maintaining a healthy, active being.

Order and Complexity:

If order and complexity are necessary to the individual, to what degree do we require each of these ingredients? Perhaps this is the crucial question: what degree of ambiguity is optimal within any given environment? How greatly do the needs of individuals vary? Barron decided that the characteristic of creative personalities was the ability to tolerate, and even to prefer, ambiguous and complicated visual formations, rather than simple and direct ones. Perhaps an environment designed to satisfy the eye and soul of the artist or complex personality will only dismay and confuse an individual with different attributes. Or is there a common denominator which can be determined? A more hopeful possibility is that of designing the environment so that each individual can participate in it to the degree which gives him optimal satisfaction.

Optimal Perceptual Rate:

The specific optimal perceptual rate for any individual is unique, and may vary from situation to situation and from time to time. However, despite these individual variations, there is indication of a consensual point of visual preference among people as opposed to random scatter among individuals. Both cultural and physiological factors may inter-relate to produce this result. Various theories exist to

explain this phenomenon. Streufert and Schroeder² suggest that the optimum consensual visual preference is for ten "bits" of information per unit time. Miller³ however, found that the median number of "bits" which could be assimilated and processed, regardless of the sensory channel used, was equal to seven with a variance of two. Once this number was exceeded, generalization occurred. These findings however, yield no reliable information as to what constitutes an information "bit" in the urban environment. Further research is required to answer such questions.

Streufert and Schroeder also imply that most adults in a given culture reach a point of visual development which they have in common with each other. Hebb⁴ suggests that this consensual point can be expanded with training. His theory, based on neurological data, is that optimal preference is for the middle range of arousal stimuli. Sustained interest occurs when the perceiver is faced with a stimulus field having some familiarity, yet some novelty. In any society therefore, a variation exists in the level of capacity, but there is also an average capacity.

Summary:

As a result of our examination then, we can draw the following conclusions:

- (1) Within any given culture broad similarities occur in the related processes of perception and aesthetic satisfaction. These two processes have both physiological and cultural components, and learning and motivation seem to play large roles.

- (2) There also exists within homogeneous cultures an optimal perceptual rate. Stimuli in excess of this capacity leads to generalization, rather than assimilation. However, capacity can be increased through exposure to more complex stimuli over time.
- (3) The search for stimulus variability and complexity - that is, curiosity and exploratory behavior - is a basic incentive in human behavior. Consequently, more complex situations will be sought out for their own sake.

Rather than criteria for solutions, we arrive at only more questions which are related primarily to the problems of testing. The major issues are:

- (1) How can the optimal perceptual rate be determined?
- (2) How can the degree of complexity and order which is most compatible with the optimal perceptual rate be tested?
- (3) To what extent does information-seeking dominate the perception of urban situations?
- (4) What would be required to create an environment which would allow for the greatest range of individual satisfaction?

Elaborate or extensive testing procedures are beyond the limits of this study. However, a tentative and exploratory survey will be attempted in an effort to clarify some of these questions. The subsequent chapters will outline the methods used and the results obtained. It must be emphasized that this research is of a very limited nature and not intended to produce conclusive results, but rather to investigate

the possibilities of assessing environmental perception and responses.

Footnotes

1. Arthur Koestler, The Ghost in the Machine, N.Y. MacMillan, 1967, p. 153.

2. S. Streufert and H. J. Schroeder, "Conceptual Structure, Environmental Complexity and Task Performance", Jour of Experimental Research in Personality March 1965, pp. 132-137. Quoted in Amos Rapoport and Robert Kantor, "Complexity and Ambiguity in Environmental Design." Jour of AIP, July, 1967. p. 215.

3. George Miller, "The Magical Number Seven, Plus or Minus Two." Psych. Review. LXIII (March, 1956) 81-97. Quoted in F. Vigier "An Experimental Approach to Urban Design" Jour of AIP, Vol. XXXI No. 1, 1965, p. 23.

4. D. O. Hebb, The Organization of Behavior, N.Y. Wiley & Sons, 1949, p. 241.

Chapter V

Proposed Approach to Sign Control System

The primary issue which remains is precisely how the information relating to psychophysical needs for order and complexity, optimal perceptual rates, aesthetic satisfaction and the other consideration we have explored can be related to actual and practical problems. How can these conclusions and ideas from other disciplines be integrated and applied to specific planning situations? It is apparent that the whole aesthetic implication of the urban environment has a vital importance in terms of affective behavior, and that we need to explore some of the fundamentals in order to create a foundation for thinking through the entire issue of urban aesthetics. The relationship of a psychophysical need for order and complexity to questions of aesthetics and design is of considerable importance to any examination of such urban problems.

With regard to signs and sign control measures, it is obvious that we need to re-think the entire problem on a very functional level. Therefore, this final chapter will be an attempt to relate the research already done to more specific proposals for the improvement of the visual environment, concentrating on the question of signs. Their function, their potential as a factor for enlivening and improving our visual surroundings, and their incorporation into a total approach to the urban structure will be discussed.

As has already been stated, it is not adequate to consider signs in a limited, individual sense. A more fundamental assessment of the function of signs in the total urban design is required before specific design is meaningful. Without a comprehensive re-structuring of the

present approach to sign control, we can expect little in the way of any real change or improvement.

Function:

The primary function of any sign is communication. Whether an advertising sign or traffic directional sign, the basic purpose is to inform, and to elicit some particular response. However, those which instruct must be disentangled from those which offer goods and services. At the present, public signs in particular are confusing and often difficult to see. Too often, the most trivial messages are the most blatant. The function of communication is not well served if the total scene is so confusing that no messages are received. That is, the visual complexity may be so great that early saturation is experienced by the observer, with a consequent generalization of information.

The kinds of information which are transmitted are multitudinous. Of primary importance in many instances is the information required for orientation and direction. In small stable communities, directional signs are of lesser significance as the majority of the inhabitants are aware of locations and activities. However, in the modern urban environment, everyone is to some degree a stranger in his own city. Therefore, the public sign system which includes traffic and pedestrian controls, directional and locational signs, as well as all other necessary public information is extremely important, and requires priority in any sign control system. Most important however, is the fact that

the communicative function of signs must be considered in terms of integration into the total structure of the visual environment.

Private signs cover a much wider area than do public signs, and include a greater diversity of uses. They range from giant rooftop billboards to hand-lettered "daily special" signs pasted in shop windows. They may be defined as all those advertising and identification signs maintained by and referring to particular individuals or organizations. They may be further differentiated as "on-premises"; or "rooted" and "non-rooted". "Rooted" refers to any sign which is located on the site of that activity to which it refers. Billboards on vacant lots or on the walls of empty buildings are an excellent example of non-rooted signs. The very fact that private signs include such a wide range of source, use and information would suggest that a great diversity in expression and design would also occur. Unfortunately this is not the case.

Besides serving an information function, signs serve in the larger context as design elements of a particular character. The characteristic of signs as design elements are:

1. Small scale as compared with other elements of the cityscape.
2. Temporal . . . the life span of signs varies greatly, and may range from a one-day notice to many years. However, they are relatively impermanent when compared to buildings, streets, monuments, etc.
3. Color and specific graphic expression of information, both explicit and implicit.

These three characteristics of signs makes them particularly adaptable for utilization as expressive elements in the urban scene.

The basis for the approach to sign control which will be presented develops from the conviction that each individual requires a certain degree of order and complexity in his visual environment. Signs can be directly related to this need in several ways. In their basic communicative function, signs, both explicit and implicit, are sought out and read by almost everyone. Signs and symbols make up a very large part of the urban scene. However, at the present time there is a very low level of exploitation of signs and symbols, and an almost complete lack of concern for signs as they interact in the total system. It is considered that because of the particular nature of signs (i.e. factors of time and scale) they can become significant elements in expressing order and complexity with the urban environment.

Problem:

Upon examination, it appears the primary objection to signs is their monotony and confusion. Signs and billboards permeate almost every vista, street and intersection; from building rooftops and windows to complete facades covered with signs. Yet in few areas do concentrations of graphic materials exist. What does occur is a widespread dispersal of nearly identical units which exist with little or no regard for their surroundings. Clusterings of signs do occur, as for example, Vancouver's Granville Street; in such cases this is an inadvertent, haphazard agglomeration with little definition or distinction.

As a consequence, every area within the city looks much alike, coated with an identical residue of billboards and signs, many of which advertise the same thing, and all conforming to the same sign code.

This means that little differentiation occurs in either design, size, location or density of signs throughout the entire urban area.

Sign control by-laws presently operate on a principle of restrictive controls, and most proposals for reform have concentrated on the negative aspects of communication. The main objections are ofter confusion and visual overload, and the objectives of order and quiet are stressed. Solutions which suppress or strictly control signs are often preferred. Chapter IV discusses in some detail the need for ambiguity and complexity which seems to be an innate human characteristic, and suggests that the negative approach is perhaps antithetical to the real needs and desires of the individual. It is the conclusion of this study that restrictions of the number of signs and rigid design standards for individual signs is not a feasible approach to the problem. It is also concluded that the factor of uniform restraints is a major contributor to the visual monotony which exists.

Proposals:

The need for pattern and diversity is taken as a determinant factor, as is the application of the basic concept of design that the total structure be analyzed as a whole composed of inter-related parts. The city would be considered as a total design problem, with the visual

material reflecting the basic function and character of each area within the city. The city would initially be divided into areas or districts, based upon an analysis of function and essential character. Differentiation in sign density would be encouraged in order to create areas of visual contrast, and so that the visual activity and intensity which occurs would reflect the patterns of human activity which occur in each area. The primary intent would be to create an environment which would be expressive of existing activity and character, and to increase the degree to which visual diversity can exist within an over-all structure.

Implementation:

The development of a comprehensive sign control system based upon the activities within each area and its relationship to the total urban structure would obviously necessitate major changes in existing sign control by-laws. It would also necessitate certain broad decisions to be made regarding the nature and character of the various areas which compose the city. In addition, an important element in the success of this kind of sign control measure would be the existence of a comprehensive master plan. The thorough analysis and legal foundation of such a plan would establish a sound basis for the coherence and discipline of regulatory measures of this nature.

The entire urban complex, then, would be analyzed in terms of function and character. In particular, the various elements to be analyzed would include:

1. The movement of people, goods, information within and through areas; the type, intensity, and general pattern of activity.
2. Social diversity: the various ethnic, social, economic and interest groups.
3. Type of information required for orientation in space and time.
4. A qualitative assessment considering the communication of symbolic qualities.

Different degrees and types of sign control would then be determined for each area of the city, with the total pattern of contrast and emphasis being considered. The one basic criteria for the specific controls which would apply to each area would be that signs must conform in character and quantity to the particular quality of the area.

Juxtaposition of elements is a significant factor in the experience of contrast; consequently difference could be as subtle or as emphatic as was considered desirable. To select an example within the City of Vancouver, Burrard Street might be assessed as a major traffic arterial containing activity which required restraint in the number and type of signs. Robson Street, as a pedestrian-oriented area of small specialty shops and more intense human activity on a smaller scale could reflect its activity in greatly increased sign intensity. This would include much more flexibility in the size and design of signs. This intensified activity would be in marked contrast to the decreased visual material on Burrard Street and increase the visual impact of Robson Street as well as heighten the sense of difference and of place which now exists in a very limited way.

Consequently the entire city could be visualized a a complex inter

relationship of textures. This inter-relationship already exists on a functional level; a more flexible sign code could give visual expression to the socio-economic diversity which already occurs.

Administration:

It is apparent that such a proposal would involve making certain qualitative judgments regarding the character of areas within the city. For this reason, it is emphasized that the existence of a comprehensive plan is highly desirable for the successful implementation of such a sign control system by reason of its detailed analysis and long-range approach. A thorough examination of the socio-economic factors and the demographic characteristics of each area would be as necessary as a visual analysis. Therefore, a design committee would be established within the planning office to conduct a thorough analysis of the total visual environment. In conjunction with, and complementary to the comprehensive plan, this committee would devise a sign control system for the entire city, with specific regulations relating to particular areas.

Periodic re-evaluation of the sign code would be necessary in order to maintain the viability and relevance of visual material to the environment. Ideally this would occur in conjunction with the reassessment of the master plan. The time period should not be greater than five years, and except in special cases, preferably not less than

two. Changes which were occurring naturally with separate areas would indicate changes in the type of controls which were applied to it. Changes in use and function which might be determined by decisions of the planners and city officials would also be reflected in alternations of the sign code for that area. It would therefore, remain responsive to the changes occurring over time which affect the quality and character of portions of the urban structure.

It is apparent that questions of subjectivity, value judgments, personal taste and related issues would undoubtedly be directed toward a committee with such authority. However, it is no less true, though perhaps less obvious, that decisions of transportation experts, economic forecasters, and sociologists are subject to value judgments. Objective reality is primarily a matter of viewpoint. However, it would not be the function or purpose of the proposed committee to impose rigid formulae of aesthetic standards on the community. On the contrary, this is to be avoided, and a sense of participation and involvement should be encouraged. The intent would be to analyze the city form in as complete a manner as possible, and with the help of a comprehensive plan, to reflect and enhance the essential quality of the various component parts of the city through the visual media. It is to be expected that continuing research would be undertaken on the relationship of the visual environment to the individual, and the attitudes and responses of the individual to his visual environment.

After the process of area delineation and analysis occurred, the

problem of actually translating this assessment into actuality remains. However, it must be stressed that the major purpose and intent of this proposed sign control system is not to establish a rigidly structured code which treats design from a single point of view. Rather the whole intent is to create a situation in which spontaneous, non-designed elements would function in a series of unplanned relationships - a mixture of what is considered beautiful and what is considered ugly. These relationships may be subtle or even disturbing. However the desirable result is an environment which provides for random and unforeseen opportunities and chance occurrences. These are the vital elements of the strange and beautiful which no fixed, preconceived order can produce.

In practical terms, the next step in the process of implementation after determination of areas might be the imposition of a time limit on all existing signs. After this period, which might be one to two years expired, all existing signs would have to be evaluated in terms of the new sign legislation. In some cases, this would mean elimination of signs, or a change in the type of sign. It would also result in increased signs in some areas. In the interim period, the city could initiate change by improvements and changes in the public sign system.

Public Sign System:

A revision of the controls concerning private signs should be accompanied by a re-structuring of the public system. There have been recent attempts to develop a more comprehensive non-verbal system of

public signs (for example, the UN Economic and Social Council which held a world conference in Vienna the summer of 1968 to discuss changes in the international sign agreement initially included in the Geneva Convention of 1949). However, the possibilities still seem virtually unexplored.

All graphic symbols must be learned, as knowledge and acceptance of a symbol's meaning is a prerequisite of its effectiveness. Therefore any project to develop a new vocabulary of symbols requires broad support. Public agencies are in an advantageous position in this respect. The entire assortment of public signs which is concerned primarily with traffic signs, but includes directional and locational information should be considered as a total system. The main points for consideration are:

1. Consistency, both in design and location.
2. Limited vocabulary of symbols; redundancy or close resemblance leads to difficulty in discrimination and adds to visual clutter.
3. Integration of all elements within the system, and with the total design of the urban environment.

The effort and expense involved in devising and teaching a new or expanded vocabulary of symbols indicates that any project of this nature should be started only after the most careful preparation and study of its implications. However, the potential which exists for the public sign system to function in an extended and improved way is

very great. They could set examples and provide greater interest in this aspect of the visual environment by (1) utilizing graphic material to a greater extent in the public sign system. The banners which have decorated Burrard Bridge during the summer of 1968 are a good example of strictly decorative use of graphics by a public body. (2) Increase interest and awareness in the public by exhibits and competitions in addition to increased use.

Expanded Definition of Sign:

The definition of what constitutes a "sign" should be expanded in order to allow greater creativity and to utilize the full potential of the graphic media. Greater use of non-verbal signs, either iconic or symbolic, has been urged for many years by people such as Kepes, Lynch and Appleyard, Rudolf Modley and others. A non-verbal symbol requires more participation on the part of the observer and may communicate to him on several levels. However, verbal signs, because of the flexibility and precision of words are often the most efficient means of communication. In addition, words are often powerful symbols in their own right, with many overtones of meaning.

Both verbal and symbolic signs however, have been familiar sights for many years. Less familiar perhaps, is the idea of using entire building facades as signs, or the use of Supergraphics where the entire sense of scale is altered. Objects as well could be included in an expanded vocabulary of signs. New techniques in photography and methods of outdoor projection also point toward new possibilities for signs.

¹See Progressive Architecture "Supergraphics", Nov. 1967. p.132-137 for explanations and examples.

Summary:

The basic points of this proposal are:

1. That signs be considered in terms of an over-all visual pattern within the framework of the total city.
2. That the complete urban structure be evaluated in terms of function and activity, both present and projected.
3. That discrete areas be recognized as distinct from one another in terms of their function, activity mix, character and needs. This would involve a rather complete socio-economic analysis of each area, and underlines the important fact that the existence of a viable master plan is virtually a necessity for this type of sign control.
4. Development of a flexible sign code which would recognize and encourage development of distinctive differences and contrasts between separate areas of the city.
5. That the type of restraints placed upon signs relating to design, location, number, size and other variables be related directly to the character of the specific area, always considering its relationship to, and effect upon the city as a whole.
6. That the definition of "sign" be expanded in order to utilize the potential of the graphic media as an expressive element.

The purpose of such a system of sign controls would be to allow greater flexibility and expressiveness to occur in our visual surroundings,

as well as to create a stronger relationship between the activity of a place and its visual character. Such a system would also intensify visual stimuli by juxtaposing areas of visual activity with areas of visual quiet or repose. This method would create a much greater range of contrast and complexity within our cities, while at the same time establishing a much stronger sense of order and pattern. The monotony of seemingly identical signs dispersed with uniformity throughout the entire urban area would be replaced by definite and distinct areas of visual contrast. In actual implementation, it would be expected that transitional zones of visual activity would occur, just as areas of transitional land use occur. However, by effective and imaginative application of increased flexibility in controls, this could be minimized.

Chapter VI

Conclusions

The hypothesis originally formulated as a basis for this study stated that identification, information and advertising signs form a necessary and desirable part of central commercial areas, and in addition, that their flexible control in accordance with certain psychophysical needs is a necessary alternative to the present forms of control. The question remains to what extent has the present study supported the validity of this statement.

The question of perceptual processes, and the suggestion that certain inherent psychophysical needs function at a very basic level and affect individual responses to the visual environment were critical to the present study. While many proposals are made for improvements to the visual environment, few have considered human responses a matter for much serious concern. It is the basic assumption of this study that analysis and research into human behavior forms the only adequate basis for design of the visual environment.

A review of psychological research yielded certain information regarding the processes of perception and aesthetic satisfaction, and strongly supported the hypothesis that a strong transactional relationship exists between perception and responses to the visual environment. In addition, there is evidence which indicates that certain elements are required in visual stimulation in order to satisfy an inherent need for pattern and complexity. Briefly, this research may be summarized as follows.

- (1) Literal perception, or the perception of the spatial world of surface and edge appears to be a basic physical ability, and is similar for all individuals. However, this type of perception rarely

operates at a conscious level, except when the level of ambiguity of the visual clues is too great.

- (2) Schematic perception, or the perception of the symbolic and meaningful world of objects and human relationships seems to be dependent upon a vast number of variables. Primary roles are played by learning and experience, with both motivation and association being active operative factors. Schematic perception is predominantly affected by cultural and social variables.
- (3) Innate psychophysical needs for order and complexity function within each individual, and structure responses to the visual environment. Each individual attains a certain optimal perceptual rate. Visual stimuli below this point results in monotony and boredom, while sensory input above the level of capacity leads to saturation, and in extremes, to a sense of disorientation and chaos.
- (4) The search for stimulus variability and complexity, that is, curiosity and exploratory behavior, is considered as a basic incentive in human behavior. Consequently, more complex situations will be sought out for their own sake.
- (5) The symbolic qualities of the environment, that is, the meaning and value which the individual applies to his surroundings, become operative as though they were actual properties of the object itself. Strictly behavioral studies are not adequate measures of the qualitative value of stimuli.

The conclusions which may be drawn from this study are several. The primary conclusion is that much substantial work in the field of psychology

supports the suggestion that perception of the visual environment does indeed play an integral and significant role in behavior and responses. Therefore it seems that any valid approach to urban design must operate from an understanding of these basic processes. It seems feasible and necessary to incorporate the findings of psychological research particularly that relating to needs for pattern and complexity into a new type of structure for analysis of the visual environment.

Secondly, and also of great importance, is the need to develop research techniques which will allow actual testing of perception and response to the visual environment. Obviously much research is still required at a fundamental level before adequate methods are devised which will be sophisticated enough to cope with the complex variables of the actual urban environment. As yet little concrete information exists regarding specific elements, techniques, and relationships which would create optimal perceptual responses. Most present data comes from laboratory environments, and require much more testing in actual or more realistically stimulated environments. Further research into perceptual testing and attitude and value analysis is essential.

A primary concern of this study was the application of information relating to perception, psychophysical needs and aesthetic satisfaction to actual planning problems. Signs were selected as an element in the visual environment which could be analyzed in terms of the research findings, and as a matter of legitimate concern for the urban designer. It is important to reiterate the emphasis which has already been made that in no way is the design of individual signs a concern of this study. A

more fundamental assessment of the function of signs as visual elements in the total urban design is essential before specific design is relevant.

An approach to a sign control system was developed, using criteria based upon the evidence of psychophysical needs. Very simply, the conclusion that needs for pattern and complexity are important operative factors in human responses is taken as a determinant factor. Consequently, signs are considered in terms of an over-all visual pattern within the framework of the total urban form, and would be used to emphasize and clarify distinct area characteristics and differences. The unique opportunities of using visual media for expressive purposes which is offered by commercial and advertising signs could be utilized to create greater contrast and diversity within the total visual environment. Therefore, even though good graphic design is certainly desirable within the context of this proposal, criteria for individual signs is not a matter for consideration. Rather than outline a formal statement of aesthetic standards, it is felt that the best interests of the individual and society are served when a framework of visual harmonics which is rooted in human activities is established, rather than a rigid system of specific restrictions and mandatory conformities. Diversity and elaboration should be encouraged and enjoyed; individual expression and participation within a societal context should be one of the joys of urban living.

It is realized that a sign control system such as is proposed would entail considerable legal and administrative complexities. It is not the desire of this study to either overlook or underestimate the extent of these problems. The practical considerations involved in effecting such

a system of flexible controls are formidable matters. However this proposal is not put forward as a completely finished code, not is it suggested that its immediate effectuation is possible. It is important, however, to recognize that changes in the existing structure of regulations is required if improvement of the visual environment is in reality to be achieved. It is also important to realize that other areas of public and private interaction also involve complex legal and administrative structures. The ability of the administrative structure to find ways and means of solving such problems is directly related to the degree of value which is placed on such issues. Unfortunately, until the vital importance of the visual environment on human behavior is more fully realized, it does not seem likely that any basic changes will occur.

The exploratory nature of this study has left many questions which required further research and analysis before adequate answers can be resolved. Areas of research until now quite far removed from the usual concerns of planning have been investigated and found to be relevant in many fundamental ways. The solution of the essentially human problems faced by planners must be approached by the study of human behavior. The first tentative attempts at synthesis of apparently dissassociated areas of study are often primitive, and may anticipate a somewhat dubious reception. However, planners are more and more involved with the creation and control of total environments; therefore it is critical that understanding and analysis of basic human needs and responses become primary concerns if our man-made environment is to be tolerable, much less satisfying and beautiful.

An attempt has been made to present a variety of ideas and viewpoints

from a diversity of sources. However, they all underline the fact that man's relationship to his environment is a very complex one, and one that affects him deeply in ways which are often difficult to quantify or to discuss. This relationship is not easily described in the usual quantitative or behavioristic terms. There are many realities which are neither physical or mental, but outside the antithesis of mind and body. Besides corresponding to biological needs, human behavior is fundamentally determined by realities which may be loosely categorized into cultural, symbolic and spiritual values. It is precisely these realms which contain specifically human behavior. We must try therefore, to find ways to understand these complex realities, and the needs which accompany them. Until we have reached a better understanding of them, perhaps we should at least recognize their existence, and try to accommodate them within the framework of our societies and cities.

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