THE METROPOLITAN IMAGE

An enquiry into the interactions of human perception with the everyday physical environment, and the relevance of these interactions to the Public Interest in contemporary metropolitan communities.

by

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Accepted by: _______________________________
Chairman Departmental Committee.
Professor John T. Howard,
Head,
Dept of City and Regional Planning,
Massachusetts Institute of Technology,
Cambridge 39, Mass.

Dear Professor Howard,

In partial fulfillment of the requirements for the degree of Master in City Planning, I submit herewith my thesis entitled "THE METROPOLITAN IMAGE" being an enquiry into the interactions of human perception with the everyday physical environment and the relevance of these interactions to the Public Interest in contemporary metropolitan communities.

I remain,

Yours faithfully,

WALTER GEORGE CLARKE
I wish to thank
the Faculty of the Department of
City and Regional Planning, M.I.T.,
whose collective criticism, patience,
generosity and adventurousness
has set for me standards
for which I shall always honor
both them and the Institute.

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in the first place.

g.c.
ABSTRACT

There is a continuum of action and reaction between the norms and probabilities of human behavior and the generalized physiognomic character of the habitually perceived physical environment. A theoretical framework is suggested here as an analogue to this complex process of mutual development, an analogue having potentially measurable connections with observable events in contemporary metropolitan communities.

The action of metropolitan-scale environment on individuals and social groups is likely to be at its most dynamic during adolescence and youth; the reaction of developed personalities on the physical environment is likely to be most effective after, say, age 30. These phenomena are analysed under three hypotheses:

(i) indivisible processes of perception and conception, applied to the constellations of sense stimuli coming from the physical environment, produce mental structures of identities (gestalten), impressions (gestaltqualitäten), signals and symbols which mesh together at many levels in the perceiver's mind to form his environmental images.

(ii) the dynamic structuring of these images within the brain field produces orientation, which is both physical, i.e. necessary for way-finding, and psychological, in the sense that it, among other influences, helps to mould the perceiver's conceptual and emotional "world-view" or "sense of reality".

(iii) a person, or a group, can only exploit the opportunities available in a physical environment according to
the sureness of physical orientation achieved and according to the validity of psychological orientation derived, for the latter provides a pattern to which individuals and culture-groups adapt their personalities and behavior, and on the basis of belief in which, they act. In as much as these acts contribute to change and development in the physical environment itself, the cycle of man-environment action and reaction ($E \alpha M \alpha E$) may be said to be complete.

The granting of these hypotheses raises questions of ethics, of social responsibility and of a possible public interest in perceptual urban form from the scale of the neighborhood to that of the metropolitan region. For example, a perceived environment whose predominant impression upon those who habitually move about within it was of chaos, and of unpredictable, violent contrasts, may be a major factor in persuading adolescents to a psychological orientation of belief that society itself was of the same character. Acts based upon such a sense of reality will naturally tend to compound chaos and violence in society as in the forms of the physical environment. This kind of self-perpetuating degeneration, if it can be proved to operate, threatens certain socio-cultural suicide.

If future research can more precisely define examples of the causal connections suggested herein, then it might be possible to demonstrate a Public Interest in the qualities of environmental design, perhaps equal to that already recognised by the multitudinous legal standards of sanitation.
Boston region, 1958.
There was a child went forth every day,
And the first object he look'd upon, that object he became,
And that object became part of him for the day or a certain part of the day,
Or for many years or stretching cycles of years.
The early lilacs became part of this child....
And all the changes of city and country wherever he went.

.... the sense of what is real, the thought if after all it should prove unreal....

The streets themselves and the façades of houses, and goods in the windows,
Vehicles, teams, the heavy-plank'd wharves, the huge crossing at the ferries,
The village on the highland seen from afar at sunset, the river between....

These became part of that child who went forth every day, and who now goes, and will always go forth every day.

Walt Whitman 1855
1. My thesis is contained within the construct "Environment varies as Man varies as Environment" – E $\propto$ M $\propto$ E. It is roughly expressed in Winston Churchill's aphorism: "We make our buildings and then our buildings make us".¹

2. In this context, the term M can as well represent any individual person or any collection of individuals which constitutes a community, a class or a cultural group. In each case, the focus here is upon the interactions of the psyche, and not of the physical body, with the environment, except in so far as the body acts to transmit sense data to the brain. In other words, I here am concerned with the habitual or characteristic patterns and qualities of human behaviour and personality, to the virtual exclusion of physical characteristics.²

3. Rather the reverse holds for the significance given to the term E. In this context, I will be concerned with the outer physiognomic attributes of the physical environment — highways and rivers,
trees and buildings, crowds and cities — and with
the environments of sociology, technology and econ-
omics only in so far as they are, or could be, exhib-
itied in the humanized physical environment and there-
by revealed to direct perception through the senses.

4. The relationships between human feelings,
thoughts and responses, on the one hand, and the per-
ceived forms of the physical environment on the other,
are at the center of this field of enquiry. The
focus here is neither upon psychology nor upon urban-
ism, but on the processes that enmesh the two. The
enquiry covers the "sense" derived from the "sensed
world" of four dimensions. This includes all
information and all feeling, absorbed consciously
or not, but derived from the senses as they operate
over time and as they range through the physical
environment.

5. Thus the focus is upon the awareness and
ideas of things outside and beyond himself that a
man gains as he moves about each day, living in
intimate contact with his immediate environment.
He must first, of course, learn to orient himself
physically within it, in order to find his way...
from place to place. But he must adapt himself to
the outside world on many other more complex levels
as well. His characteristic behaviour, and hence,
to some extent, his personality, tends to mould
itself in response to the image of reality gained
directly from his perception of the physical world
about him. The image may be distorted in any of
a thousand different ways. His response to his
image may be of love, hate or anything between,
and he may, in consequence, tend to withdraw from
participation in some parts of the environment,
or to extend his participation in other sectors.
Finally, a man will turn to change or modify the
physical environment - to repaint or rearrange a
room, to select a site and build a house, or even
to take part in larger scale enterprises which
change the face of cities and of continents.
6. The construct E ∩ M ∩ E postulates a contin-
uous spiral of evolutionary tendencies in both E
and M. It implies a continuum of action and re-
action between the norms and probabilities of human
thought and behaviour, and the physiognomic charact-
er of the physical environment. It does not, however, postulate an unbroken chain of causation, for it covers only certain limited aspects of individual human development and of social change, as well as only certain limited aspects of the changes wrought by men to their physical environments.

7. For the beginning at least, it would be simpler to omit from this formulation those discontinuous jumps in the ordinary processes of ontogenesis and phylogenesis which are marked by spectacular innovators and innovations, dramatic technological and political upheavals, and the like. Nevertheless, I would continue to maintain that there are some causal connections between the overall character of a society or a social group and the character of the environmental forms which it inhabits and those which it eventually reacts to create. It could then be argued that environmental forms vary according to a lot of factors, one of which is the human "will", "psyche" or "culture", whilst these human attributes themselves vary according to a lot of factors, one of which is the character of environmental forms as perceived, among which the society or group has lived during its formative period.
Several radically different approaches are open to enquiry in this field. One would be a study of the relatively direct responses to environment seemingly typical of children and artists. Many poets, painters, novelists, architects and autobiographers in general, have put on record their own personal feelings and responses to places, particularly to the surroundings of their childhood and youth. Lawrence Durrell, Alfred Kazin, Wassily Kandinsky, Piet Modrian, Marcel Proust and Louis Sullivan are pertinent examples. Likewise, a brief scanning of anthropological literature yields a great richness of material relating cultural characteristics to their roots in the environmental characteristics perceived by settled peoples who lived for long periods in a stable society confined to a limited geographical area. Cassirer's hypothesis that spatial distinctions are at the base of all other distinctions, for example, directly links the origin, growth and elaboration of language with ordinary, everyday, environmental perception and with what he calls "mythical ways of perceiving space." Further investigation along these lines could lead to definitions of
M (both individual and collective) in terms of the physical environment perceived.

9. Parallel to such a study of M as a function of E, much work has already been done by critics and historians towards defining, in effect, E as a function of M. The work of Wölfflin, N. Pevsner, Herbert Read, Wittkower, Rasmussen, Panofsky, Mumford and Zevi is particularly relevant. It appears that men imbued with certain feelings and beliefs (some part of which, I would claim, originated in their earlier environmental perceptions) when they cooperate to create buildings and cities, choose those abstract perceptual qualities of form which correspond to, and express, their inner conceptions. This process may be conscious or unconscious in varying degrees; it may proceed through acts of commission or omission. But finally, we can say that an urban environment or any humanized landscape is a realisation of a society's will, or lack of it, to shape life in a certain way, not only in the technological and economic sense, but also symbolically and expressively. Conversely, an urban environment or a humanized landscape is a
picture, a reflection from which can be read the dominant qualities of the culture which produced it.

10. Speculation along these lines has been extremely popular, and the kinds of ideas we are dealing with here are commonly to be found both in poetry and the vernacular. But they have not been the subject of much disciplined study. Indeed, any such disciplined study has had to await the development of knowledge and hypotheses in social and individual psychology, in the psychology of perception, in theory of aesthetics, in cultural anthropology, in urban ecology and urban morphology.

In order to study the interaction between a specific individual or a specific group of people and the physiognomy of a specific city or countryside, we need to relate and combine insights and techniques from each of these established fields of enquiry.

11. In many ways, it would be easier to begin such a synthesis by studying case-histories of individuals or social groups and cities all long since dead, or at least far removed from the hurly-burly of contemporary life amidst modern metropolises.
The virtues of this technique would be those of perspective, of hindsight, and of relative simplicity, but the defect of the virtue would be a degree of over-simplification and superficiality, as well as a lack of immediate relevance to present-day situations and immediate problems in city planning and urban design. Reaching backward in time for evidence automatically denies one the opportunity for new operational definitions and new experimental checks. Going outward to foreign, or to the surviving "primitive" cultures, automatically denies an enquirer use of the complexity of insight he has inevitably built up concerning his own urban society and environment. It also denies to all but a few specialists the opportunity of checking whatever conclusions may be drawn. Therefore, I have attempted to base a theoretical framework on a continuous series of deductions which can be empirically related to present-day events and situations. I have sought to uncover the dialectic process between psyche and physical environment at work within the mind of the individual member of a contemporary metropolitan community.
12. I have now defined the object of my search as a "theoretical framework" and as a "dialectic process". In other words, even though my enquiry may use examples of particular people, acting under particular cultural influences, interpreting and responding to particular environmental forms, it is primarily directed towards abstracting invariants which are characteristic of the underlying human processes themselves, as they normally occur at least in members of contemporary metropolitan communities, and probably among members of all communities in all places at all times. In Cassirer's phrase, my aim is "not a unity of effects, but a unity of action; not a unity of products, but a unity of the creative process".  

13. This, of course, rules out any search for "rules of thumb" or for "design formulae" which catalogue specific environmental stimuli and specific human responses to them. Such rules of thumb are in fact necessary and inevitable in every stable society and in each successfully developed urban landscape. I am here not directly concerned with setting these kinds of standards for everyday use,
but with the generally unrecognised principles which underlie them and which give them a fundamentally rational aspect.

14. My search is therefore for a framework of hypotheses capable of serving as a valid abstract analogue to the shifting complexities of concrete phenomena -- an analogue which will have measurable connections with operations in the real world at strategic points.

15. The testing of the hypotheses through experiment, normative surveys and historico-cultural analysis could only be carried out at considerable cost over a long period of time. Knowledge of the probabilities of particular human responses to characteristic situations might then be arranged in superimposed levels of generality, of invariancy. One connection may not vary over thousands of years of recorded human history, and so could conceivably be employed as a "rule of thumb" of some practical value. Another connection between an environmental stimulus and a response may be peculiar to one group, one place, one time. However, to recapitulate, the most basic hypothesis would not deal in catalogues
of this kind, but would describe, or be an analogue for, the dynamics of a process at work in the brainfields of individuals who are caught up in the day-to-day business of living in an urbanized area and who contribute to its physical growth and change.
1. Consider for a moment a dramatically heightened example of the kind of phenomenon we are investigating. When Wassily Kandinsky, the painter, spoke of Moscow, his early childhood memories fused with those of his student years into a single symphony of colors and sounds. For Kandinsky, we are told, Moscow was the "epitome of Russia" and he regarded it as "the source of his artistic inspirations, his pictorial tuning fork". "I have the feeling that it has always been so" he wrote "and that at bottom, I have always painted this single 'model', merely strengthening the expression and perfecting the form over the years".

2. It so happened that the young Kandinsky was extraordinarily sensitive to the rich shapes and colors of the cathedrals, the palaces and the chiming bells of late 19th century Moscow. Others sharing the same physical environment at the same time were more attuned to other expressions of the "mémoire collective", particularly, say, to the discursive logic of literature and polemic. But even the developing revolutionaries must have relied on their...
direct perceptions in the physical environment for a large part of their passionate awareness of the violent and incongruous contrasts between rich and poor, between splendor and misery. In other words, there would have been a difference of degree rather than of kind, a difference in emphasis and interpretation, between the reactions of a young Kandinsky and his visually less sensitive but more action-oriented peers to the city of their awakening youth. The perceiving, interpreting and transmitting genius of an artist like Kandinsky is, nevertheless, of universal significance, for it represents the distilled essence of a universal experience which is usually rejected, ignored or at best, only partially comprehended and exploited.

3. But the "dramatically heightened example" is these days an insufficient model for scientific purposes. We must stick closer to "reality", to the averages of average people. A series of hypotheses describing the continuing spiral of interaction between a man and his perceptible environment is summarized in an accompanying diagram (see Plate II). I will now attempt to explain this conceptual model in some detail.
MODIFIED ENVIRONMENT (IN FACT)

DEVELOPMENT OF PHYSICAL ENVIRONMENT

PLANS FORMS POSSIBILITIES

POLICIES GOALS VALUES

MODIFIED ENVIRONMENT (IN EFFECT)

REORIENTED PERSON

REORIENTATION REIMAGING

PERCEPTION PARTICIPATION OVER EXTENDED PATTERNS

EXPLORATION OF NEW AREAS

CHOICES OF PREFERRED TYPES OF ENVIRONMENT

SURVIVAL

ORIENTED PERSON

ORIENTATION PHYSICAL & PSYCHOLOGICAL

IMAGE MAKING GESTALTEN & GESTALTQUALITÄTEN

PERCEPTION PARTICIPATION

TOTALITY OF PAST EVENTS & EXPERIENCES HISTORICAL & CULTURAL

CONCEPTUAL MODEL OF MAN-ENVIRONMENT INTERACTION

Plate II p. 18.
4. When studying the influence of environmental perception upon the individual or the social group, it seems reasonable to focus attention upon younger people, while, at the same time it seems reasonable to focus upon older people when studying the influence of individuals and social groups upon the physical environment. This division of attention among age groups is of course merely a convenient device for simplifying our first investigations of a dynamic phenomenon. It can be abandoned whenever it ceases to be useful.

5. How are we to define "younger" and "older" in this context? Piaget and Inhelder, in their monumental work "The Child's Conception of Space", conclude that a child's actions on objects and his movements within the physical environment eventually enable it to "transcend physical limitations and create operational schemata which can be formalized and made in function in a purely abstract, deductive fashion". One of the most vital of these abstract concepts is that of the "true vertical" and the "true" horizontal, as opposed to the more elementary concept of one isolated thing being at right angles to another. Children normally perceive and confidently draw trees on mountainsides as truly vertical only after
age 9 or 10. Perhaps not without reason, this is also the time when they begin to venture alone away from the immediate neighborhood of the home, exploring wider areas in search of amusement and recreation. The step from elementary to high school usually involves a much longer daily journey, and it is from this point onward that a child begins to become aware of, and to experience directly, the wider "regional" environment.

6. Therefore in any study of the effects of large-scale physical environment on those who perceive it, there is little profit to be had in starting earlier than, say, age 10. This of course does not diminish the formative influence of earlier environmental experiences, such as are provided by the cradle, the high-chair, the play pen, the playground and the backyard.

7. The process of individual or social development, in as much as it is governed by environmental perceptions, is called by Piaget a process of "adaptation" which he describes as a "dynamic equilibrium between assimilation and accommodation". Piaget describes accommodation as the process by which "transformations are induced in the subject's existing schemata, mental imagery and patterns of behavior, by the environment". Assimilation
is the opposite process—the "manner in which the object itself is transformed and made to correspond with the subject's schemata." This formulation helps to remind us that an environment can be "changed" in more ways than one, namely, in imagination, in effect or in fact. A given environment can be privately interpreted so as to conform with preconceived images or phantasies, and this is exactly what very young children and schizophrenics do. If the sense of reality is too strong, an unsatisfying environment can nevertheless be exchanged for another, simply by moving from one place to another. If this is still not good enough, then the environment can be physically changed by direct action upon it, so that it will conform with the preconceived schemata, phantasy or vision.

8. Everyone indulges in each of these three types of assimilation, to some extent each day. How does one simplify this continuous activity into chunks large enough to be significant at the scales of time and space on which metropolitan regions, say, grow and develop?

9. It seems reasonable to assume that most people become more or less "set" in their ways and attitudes after something like age 30. They have by then passed 21.
the period of maximum rate of change and personal development, as psychological indices commonly show. The action of "metropolitan-scale" environment upon individuals is therefore likely to be at its most dynamic during the years somewhere between ages 10 and 30. While people remain in this age group, the second kind of assimilation mentioned above will normally be dominant over the others, at least as far as the large-scale urban environment is concerned. But it is only as people approach and pass age 30 that they normally play any important role in changing and developing the physical environment in the third sense mentioned above. Then, as homebuilders, as voters on local government issues, as investors, as businessmen, as designers and as decision-makers of all kinds, they make myriads of small and large decisions which, taken together, make the urban environment of one decade very different from that of the last. Younger people tend to change their physical environment "in effect", by enlarging it or changing it altogether, by exploring new areas in their search to discover what the world is really like. Older people, having oriented themselves to a fairly
settled world-view, tend to be in positions of power and responsibility which enable them to change the physiognomy of their surroundings.

11. To take a concrete example would be to think in terms of an individual young person and the metropolitan region within which he or she lives. Whatever examples we choose, we must accept them as we find them, that is to say, both are conditioned by the totality of past experiences and occurrences which have formed them. The total field of history and culture which lies behind the individual may be completely divorced from the total field which has formed the metropolis; this would be the case, for example, on the day of arrival of an uneducated foreign immigrant. Their backgrounds may, however, overlap, as in the case of a student living in the metropolis, but born and bred in another region of the same country, or in a country of similar cultural traditions. This overlapping would be maximized in the case of an individual living in the house of his childhood, and in the same house or district inhabited by his family for generations past.

12. The simplest and most obvious way in which to begin examining the interaction between our individual
and the physical metropolis is to measure what I call his "patterns of participation". In effect, this means that we must actually define upon a map just what his "physical environment" really is. It will probably not be any entire region of any real size, unless he is in the habit of making intensive house-to-house surveys, or of frequenting vantage-points commanding wide views. It will, however, consist of what he can see if he cares to look as he goes about his regular activities.

13. Every freely mobile person, excluding by that definition those confined to sick-bed, jail, boarding-school, monastery or in similar seclusion, does in fact "participate" in the environment, in the sense that he moves about in it, for the most part fairly purposefully. This participation may be cribbed, cabined and confined by the tyranny of a restrictive sub-culture - the immigrant may rarely venture outside his ghetto, the middle-class businessman or adolescent may commute only between certain limited centers of gentility. At the other extreme, there are cosmopolites whose urban participation is divided between the central areas of metropolises thousands of miles apart.

14. Participation can be observed and measured.
A map can be constructed showing, by means of lines of varying thickness, the density and extent of journeys made by an individual over a standard unit of time. Such measurement can be as accurate or as diagrammatic as circumstances allow, or as is warranted by the scale of investigation being made. A simple technique has been applied by Mlle M. Alibert to represent the trips taken during a year by a young girl living on the Ave Victor-Hugo in the bourgeois 16ième arrondissement of Paris. Another even more simple diagram from the same source represents the "arteries frequented by 30 persons living on the Avenue Victor-Hugo". Chombart de Lauwe has constructed dot-maps locating the residences of friends and relatives customarily visited by five families in the bourgeois 16ième, and five families in the proletarian 13ième arrondissement. These show extremely different patterns; the bourgeois families have friends and relations spread thickly and evenly over the western half of the metropolis, while the proletarians' social contacts and typical patterns of participation are severely restricted to the immediate neighborhood of the home. Typical patterns of environmental participation by age and class groups would probably be rather differ-
ent in American urban areas from these French examples. Nevertheless, these notions provide important opportunities for experiment. We can observe and measure the participation patterns of both French and American young people of similar ages, social classes and so on, living in similar types of urban areas. We can observe the changes, normally extensions, in participation patterns as young people develop year by year. If we can then adapt some method of observing and perhaps measuring the psychological impacts at each selected stage of pattern-change, then we can begin to correlate participation and the effects of it.

16. The most suitable unit of time for studies of environmental participation would normally be the year. Over a full year, a participation pattern should reveal the rhythm of seasonal activities, or the absense of such a rhythm, which would itself be significant in many ways.
We are able to use, enjoy and participate in the physical environment, not least because we can perceive it. The act of perception is a deriving of "sense" from the "senses". The focus of my present enquiry is upon the various kinds of "sense" which can be derived from the human senses as they range through the physical environment at an urban or metropolitan scale over relatively long periods of months and years.

The psychology and physiology of perception are wide and controversial fields of enquiry, from whose literature I have taken a series of related hypotheses which I believe to be especially relevant to the area of enquiry and action with which the urbanist and city-planner are concerned. The body and experiment on which I rely originated with the early Gestalt psychologists, Koffka, Köhler,
and Wertheimer,\textsuperscript{2} and has been extended and adapted by such diverse workers as the Allports, Arnheim, Bruner, Cantril, Kepes, Langer, Lewin, Werner and many others.\textsuperscript{3}

3. Perception is characterized by simplification of the confused welter of sense stimuli impinging upon the sense organs, abstraction of salient features and the structuring of these outstanding features into "gestalten", "segregated wholes" and/or "images". This automatic organizing activity seems to be inherent and intrinsic in our receptor apparatus and is "the primitive root" of all abstraction, all logic, all rationality. Man is most truly to be named, says Cassirer, the "animal symbolicum", for it is this characterization which most effectively encompasses the activity of the language building tribesman, the artist and the mathematician, as well as each ordinary mortal man whose eyes, ears and fingers ever performed their most elementary functions.\textsuperscript{4}
From this viewpoint, the old barriers between perception and conception are dissolved; perceiving and conceptual thinking are merely the early and late ranges along a continuous scale of abstracting, organizing, symbolizing activity. No one seems yet able to demonstrate accurately the precise electro-chemical steps of which the psychological hypotheses are postulated as analogues, but this sort of knowledge of brain processes would anyway be irrelevant to this present study, which explores some of the consequences of Gestalt theory, assuming it to be valid.

4. Perception can be called an individual "creative" act because it is an imposing or selecting of order, a producer or a product of some universal human "will-to-form". But even though in the final analysis perception is an individual act,
varying from one person to another, varying from one situation to another, nevertheless, in as much as human beings are psychologically and physiologically alike, then their perceptions of similar sense data in similar situations will accord to certain probabilities. For example, the members of a fairly homogeneous tribal or other social group, sharing a common culture or sub-culture, whose movements are limited to a particular area of environment, will exhibit the smallest divergencies between individual percepts and responses when confronted with similar sense-data in similar situations.

5. Notwithstanding this kind of opportunity for consensus in perception, the Gestalt psychologists have been at pains to describe the process of image-making not only as a universal one, but also as conforming to certain basic and universal modes. The manner and probability of segregation and ordering of a given mosaic of sensuous stimuli is by no means a matter of either individual or even cultural eccentricity. In any given mosaic, there is a predilection for certain general kinds of order as against others. The figure-ground relationship,
for example, seems the most fundamental of these; "grouping" is akin, springing from "principles of similarity" which make for the perception of segregated wholes from constellations of stimuli similar in size, shape, brightness, color, location, spatial orientation and so on. By separating shapes and groups of stimuli from their backgrounds, we gain the commonsense impression that the world is composed of discrete physical objects. Simple and regular closed forms are perceived more easily and more often than irregular or broken forms; rough or incomplete forms are smoothed and completed in perceptual organisation. Illustrating these principles here would be superfluous, as I assume the reader's familiarity with the body of work done by Arnheim and Kepes, for example, who are among the many to develop and multiply the original demonstrations of Koffka, Kohler and Wertheimer. 6

6. Panoramic sequences of stimuli impinge on the senses as one moves about in an urban or any other physical environment. Perception can only be said to occur to the degree to which these constellations of stimuli are grouped into "gest-
alten", roughly "forms" (which may be shapes, lines, patterns, surfaces, etc) and to the the degree to which these forms are simultaneously structured into mental "images". These pure forms and images, however, are revealed on analysis to express "gestalt-qualitäten", roughly translated "form-and-feeling qualities", such as symmetry, harmony, imbalance, tension, discord, contrast, and so on. These familiar characteristics of human perceptual organisation are inseparably both purely formal and at the same time evocative of feeling... they are "isomorphs". Thus the purely tonal structures of music, for example, in Langer's description, "bear a close logical similarity to the forms of human feeling - forms of growth and attenuation, flowing and stowing, conflict and resolution, speed, arrest, terrific excitement, calm or subtle activation and dreamy lapses - not joy or sorrow perhaps, but the poignancy of either or both - the greatness and brevity and eternal passing of everything vitally felt. Such is the pattern or logical form of sentience; and the pattern of music is that same form worked out in pure measured sound and silence. Music is a tonal analogue of emotive
This impact of "significance" transmitted in the purely formal "gestalten" is an intrinsic part of a percept. Although some such statement lies at the root of all artistic activity and all aesthetic appreciation, it has not been until recently a matter of scientifically oriented enquiry. In presenting the Gestalt theory of expression, Arnheim argues that, in fact, expression can be described as the primary content of vision. We have been trained to think of perception, he writes, as "the recording of shapes, distances, hues, motions. But the awareness of these measurable characteristics is really a fairly late accomplishment of the human mind. Even in the Western man of the 20th century, it presupposes special conditions. It is the attitude of the scientist and the engineer or of the salesman who estimates the size of a customer's waist, the shade of a lipstick, the weight of a suitcase. But if I sit in front of a fire, I do not normally register certain shades of red, various degrees of brightness, geometrically defined shapes moving at such and such a speed. I see the graceful play of aggressive tongues.
flexibly striving, lively color. The face of a person is more readily perceived and remembered as being alert, tense, concentrated, rather than as being triangularly shaped, having slanted eyebrows, straight lips and so on. This priority of expression, although somewhat modified in adults by a scientifically oriented education, is striking in children and primitives, as has been shown by Werner and Kohler. 9

8. The standard "projective techniques" of experimental psychology make use of expressive inkblots, puppets and the rest. Special features of an individual's response to these forms are considered to reveal the special features of the individual's psyche. But Gestalt theory also considers "mountains, clouds, sirens, machines expressive" and that there are analogues between percepts and feelings. Werner has proposed the term "physiognomic perception" for this general mode of cognition of expressive forms, as distinct from the "geometric-technical" mode of purely formal cognition. 10 The priority of physiognomic perception in primitive cultures, in all children and even in relaxed contemporary adults, appears natural enough. The function of the human senses has
always been basically to aid in properly reacting and adapting to the environment. Animals, including men, are primarily interested in the forces active in their vicinity, and violence, hostility, friendliness, calmness and so on are self-evident in many percepts. This applies even in the urban jungle of social life, where an ability to recognise the intent of other human beings simply by perceiving their faces is a great aid to survival.

9. It was just this "expressive" content of perception that was at the base of Louis Sullivan's famous phrase "form follows function". He dealt chiefly with "the physiognomy of each building - its external aspect - considered in a general way as a revelation of character".11 He makes his student interlocutor say "The gist of it is, I take it, that behind every form there is a vital something or other which we do not see, yet which makes itself visible in that form ... just as every form has its function, so every function finds or is striving to find its form. And furthermore, while this is true of the everyday things we see about us in nature and in the reflection of nature we call
human life, it is just as true because it is a universal law, of everything that the mind can take hold of." Sullivan's writings, as well as his architecture, are living witnesses to the "priority of expression" in perception. Extensive quotation of his own words seems necessary here because his central phrase, which is entirely relevant to my own thesis, has become incorporated into the vernacular with a meaning attached to it directly the opposite of the one he intended. "Life seeks and begets its like. That which exists in the spirit ever seeks and finds its physical counterpart in form. An uncouth thought, an uncouth form; a monstrous thought, a monstrous form; a thought in decadence, a form in decadence; a living thought, a living form... Form is everything and anything, everywhere and at every instant. According to their nature, their function, some forms are definite, some indefinite; some nebulous, others concrete and sharp; some symmetrical, others purely rhythmical... But all, without fail, stand for relationships between the immaterial and the material... The Infinite Spirit and th finite mind... Little by little, through his senses, Man divines the Infinite."
Sullivan was privileged to use this kind of language; but in their more guarded terms, Arnheim, Langer, Kepes and Werner are talking about the same kind of phenomena.

II. It is important to emphasize that environmental perception has effects and reverberations through the complete range of senses: even the single, although most important, sense of vision includes a diverse cluster of sensorial functions, which to a limited extent vary independently of each other between individuals, and which allow the perception of different kind of gestalten. These diverse visual functions can, therefore, be talked about separately. "Peripheral" and "foveal" vision allow us to perceive the complete field of a space and simultaneously to focus on smaller segregated wholes within the space; "binocular" vision is thought to allow visual perception of depth; "color" vision is a powerful stimulant. 14
Neutra is particularly aware of the multitudinous ways in which our senses are at work in architectural perception. He speaks of the "perpetual and intimate sensorial combinations" fused in environmental perception in the process known to physiologists as "stereognosia". He mentions the acceleration sense of the inner ear "which promptly reports to us whether we tilt our heads while we look up to that looming cathedral spire, or peep down through a floor hatch into the elevator shaft of the Empire State building". He continues: "Built into the skin and inside our skin, the muscle packs too, are sense equipped to report to us; while we turn and walk through the arches of the Mosque of Cordova, when we leave the level to step on a ramp, climb a stair, get our foot-soles icy cold by thermal losses on the stone floor. We feel the draft from the sacristry door, cooling our surface by evaporating the tiny sweat droplets over each pore of our skin; we hear reverberation of our steps on surrounding stone walls differently from what we experience in Hollywood stage settings of studio board - to the eye most faithfully similar. And there, also, the smell is quite
different from that which is exhalated by the microbiotic life settled on the old masonry. We could go on and on talking of what environmental impacts are in natural or man-made surroundings and in well or poorly designed settings.\textsuperscript{15}

13. Wertheimer and Kohler do not restrict the principle of spontaneous organisation of sensory fields solely to visual perception.\textsuperscript{16} They have rather been at pains to demonstrate that gestalt theory applies equally well to kinesthetic, auditory and tactile stimuli, considered both separately and when combined with other senses. They have similarly been at pains to demonstrate that gestalt theory is not restricted to the organisation of relations in space, but applies also to the ordering of sequences of impressions over time.\textsuperscript{17} So we can be said to perceive "form" in sound sequences, sight sequences and kinesthetic sequences, either separately or all together in the kind of environmental perception with which I am primarily concerned here.

14. Lewin and Tolman have stressed and re-emphasized the principle laid down by the early gestaltists that \textit{any account of a perceptual act is incomplete}
unless it includes a study of the "inner self" or culturally influenced individual that is doing the perceiving, of the "attitude", "motivation" or "drive" which governs that personality at the moment of perception, as well as of the constellations of sense stimuli which are available for selection and organisation into images. Thus each perceived image is the "resultant diagram of forces" structured by these three independent systems of forces, each independently variable, but which act together dynamically in a single "situation". Tolman, for example, has shown that thirsty rats do not notice food, hungry rats ignore water. Kohler wrote: "Organisation is an affair involving the whole field and the self is included as the most interesting member of this larger organisation. Sometimes the self is central (as for example, in physical orientation) or other persons may be central... We have seen that nothing is more likely to determine grouping and organisation than the direction of attitude and general behavior. A dog barks at something. The most compulsory organisation which can occur in experience is a dynamical event or attitude, consisting of one member from 40.
which it issues and another toward which it is
directed... the total field almost always has this
bipolar character... from the self to something,
or away." 19 Lewin's major contribution in this
area has been to devise mathematical models, topo-
logically conceived, for the relationship of person
and environment, where each is treated as a region
within the total situation of the moment. 20
15. One of the kinds of "learning" dealt with
by Tolman, 21 he calls "field expectancies" or "sign-
gestalt expectancies". After repeated exposure to
an environment, an observer tends to acquire "an
apprehension not only of each group of immediate stimuli
as it impinges on him, but he also tends to acquire
a 'set' such that, upon the apprehension of the first
group of stimuli in the field, he becomes prepared
for the further 'to come' groups of stimuli and also
for some of the interconnections or field relationships
between such groups of stimuli". Tolman's formulation
differs, however, from the mechanist theories of the
conditioned reflex: "expectancies" are rather based
on "cognitive maps" relative to an environment, which
are built up over time, but which depend not merely on
repetition, but also upon motivation or drive. Furthermore, the acquisition of "cognitive maps" relative to an environment depends on (i) the breadth of things an organism is capable of perceiving, (ii) its powers of memory and abilities to structure and associate percepts, to apprehend the isomorphic correlations between separate gestalten and between gestalten and gestaltqualitaten, and (iii), its inference abilities in extending expectancies re given environmental fields beyond the parts upon which the individual has been specifically exercised; these abilities underlie the organism's ability to short-cut or to deal with new situations and to satisfy new drives.

16. Employing the concept of the "cognitive map", Professor Lynch of M.I.T. has begun the task of putting environmental perception at the city scale to the tests of empirical science. It is a common experience for us to construct little "maps" and movie-like sequences of images in our heads as an aid to orientation or way-finding in the city; we have surely all drawn sketch-maps of street-routes or even whole cities, or had them drawn for us, so that a stranger might be
helped find his way around an area new to him. Lynch was the first to subject this kind of activity to any real analysis or experiment. His major concept is that of the "environmental image", defined as "the generalized mental picture of the exterior physical world that is possessed by an individual... the product both of immediate sensation and the memory of past experience". Lynch further postulates the existence of a "public image", the "common mental picture carried by the great majority of a city's inhabitants"; this may alternatively and more accurately be called a "group image", varying between sub-classes and sub-groups within the community. Lynch's experiments placed a number of "middle-class" subjects into situations so that they "motivated" into "attitudes" of way-finding or physical orientation in the central area of Boston region. Subjects seeking a practical basis for physical orientation tend to segregate their perceived environment into a series of "objects" which are seen to have useful spatial relationships between themselves and to the observer. Thus, Lynch analyzed the "environmental images" he discovered into three components: "identity, structure
and meaning", the first equivalent to "gestalten", the second to the organisation of these, the third component of "meaning" serving as a residual category for the remaining impacts of perception largely omitted from Lynch's initial studies.\textsuperscript{24}

17. However, once one begins to examine perceptual phenomena as involving the self and its attitude as integral parts of each perceptual situation, it becomes clear that a person momentarily intent on solving a way-finding problem has a strong "attitude" and his percepts become modified to serve this motivation or drive. The path-system becomes a dominant organizing feature of his environmental image, and a separate analytical category for "structure" can be most useful. But even then, what is imaged as an "object", an "identity", a "place" at one scale, at one moment, for one purpose, is transformed into a mere structural element the next, or else it becomes submerged altogether into another segregated whole.

18. Thus, for example, a treelined boulevard skirting a grassy patch of river bank — I am thinking of that piece of Route 2 by the Boylston St bridge over
the Charles River near Harvard Square in Cambridge, Mass. -- can be a very definite "place" with strong "identity" in the environmental images of anyone who has lived near it and used it for summer relaxation. At the pedestrian scale, the actual road surface at this point is a well-defined intervening space which must be crossed before one can reach the space or "place" by the riverside; apart from this, the road itself is of little perceptual impact, unless one is distracted by the endless and purposeless stream of colored vehicles on it. But when one is motivated towards way-finding at the city or metropolitan scale, especially as a motorist, the roadway asserts itself in one's mind with an "identity" of its own, a satisfyingly linear image of a major piece of metropolitan "structure".

18. In order to embrace this kind of continuous dynamic flux in imagery, I prefer to speak of "structures of identities" as being characteristic of environmental images. These structures of gestalten may be interpreted in perception either in the "geometric-technical" mode as pure forms, or in the "physiognomic" mode as isomorphs expressive of
feeling and emotive significance. If, as seems likely, the expressive impact is constantly present in perception, even if only at a subliminal or subconscious level, then one could use the term "structures of expressive identities" in analyzing environmental image phenomena. In fact, of course, any kind of classification of image-elements for analytical purposes will only be satisfactory within certain limits, for all such systems are matters of convenience.

19. Panofsky presents a neat tabulation for iconographic and iconological interpretation in his "Meaning in the Visual Arts", which accords excellently with the subdivisions I feel to be most convenient for examining the imagery of environmental perception.

The "sense" which we derive from our senses may then, following Panofsky, be treated under three major headings:

I. (a) Physical facts of size, shape and location, commonsense perception of objects and their spatial relation to the observer - the gestalten of pure form, perceived in "geometric-technical" mode.

(b) Expressive qualities inherent in the pure forms perceived, the isomorphs and analogues of feeling and
emotion; "gestaltqualitäten" perceived in "physiognomic" mode.

These two together make up the primary or natural subject matter of our study. They can both be described, in any perceptual act, without reference to anything outside the observer, without any reference to the following categories.

II. conventional signals both from (a) the practical world of commonplace objects and events and (b) the realm of custom and cultural tradition. For example, wet streets usually signify recent rain, tall chimneystacks a factory, "chino" pants and Harris tweed coat a Harvardman (at least during 1958). These are all widely accepted and understood signals announcing objects, places, types and situations; in each case, one concrete thing stands for another specific thing or situation. This category corresponds to Panofsky's "iconographical analysis" and unlike the first category, requires knowledge, especially cultural awareness, as well as observation and direct experience for its interpretation.

III. A synthesis of many percepts and much experience under categories I and II, interpreted with 47.
the aid of knowledge about "the eternal tendencies of the human mind", brings into our consciousness the third major category of "sense" which we inevitably try to ascribe to our perceptions. The search for this kind of "intrinsic" sense or significance is the most challenging task which all humanists may be said to set for themselves; especially is this so for the historians and interpreters of the arts, including architecture and urbanism. This is the realm of "significant forms" and of the "Zeitgeist" -- the specific themes, concepts and forms of, for example, literature, painting or urbanism, which throughout a single culture or through many or even all cultures, may be said to express human tendencies and aspirations.

20. Panofsky calls the search within the realm of this third category a process of "iconological interpretation" demanding the delicate and often unreliable tools of "synthetic intuition", conditioned by comparative studies in the history of cultural symptoms and symbols. Thus characteristic urban forms can be seen as symbolic of deep-flowing
elements of what some call the "collective unconscious" of a community or a people... the mysterious labyrinthine meanderings and enclosures of mediaeval urban spaces; the megalomanical axially and exposure of Versailles, Moscow University and perhaps also of the General Motors Technical Center; the vital, fearless, mobile vulgarity of the motels, gas-stations and diners of "roadtown, U.S.A."; the featureless, segregated conformity of so much present-day suburbia in many countries.

21. This neat tabulation of categories can be useful for analytical purposes, so long as we do not forget that the three kinds of sense are continuously interlocking elements of a single phenomenon, or, to put it another way, they are the major ranges along a continuous scale which runs from the elementary, momentary percept of a simple single object through to the complex synthesis of multitudinous separate percepts acquired over a long period of time, over a wide range of many experiences, not all of which are purely "perceptual", being more conceptual, more contemplative, i.e., more mythical and more symbolic.
22. For example, perception of a simple white spired church of traditional form, standing on its familiar green lawn or "common", near the center of a New England town, may be studied under any one or any combination of all three of the foregoing categories. The church may be seen as a strong abstract form, proportioned, detailed, articulated, colored, in a setting so that it is experienced as expressive of feeling which, if put into words, might be something like "serene aspiration". Probably for most people most of the time, however, it is perceived as a conventional signal, an architectural stereotype announcing "protestant New England small-town church" and perhaps additionally announcing that a town-center is near at hand. More conceptually, it can be perceived as a symbol for "Christianity" or for the traditional New England concept of "local community" or "town-ship".

23. The "sense" derived from the perception of the church can vary, as we have discussed before, with the "attitude" or "motivation" of the observer. For example, a real-estate man might perceive the pleasant lawn of the common as an asset enhancing
value in nearby property, and he may simply fail to perceive the church if he is entirely uninterested in religion. An architect may be similarly uninterested in its religious significance, but may rather be devoted to certain ways of using abstract, pure form, so as to be irritated by the staled stereotype he sees. Yet another person may have nostalgic memories of a similar church near his childhood home and so may treasure the old familiar, reassuring form. Anyone of these people may partially dispense with these responses when preoccupied with way-finding. Then the semi-conscious perception of the open green space and the white spire, glimpsed in peripheral vision, can be a sufficient indication that one must now turn, say, left, to arrive at the town center.

24. Previously I have tried to show that "structures of expressive identities" are characteristic of environmental images. In the same way, in order to encompass the kind of dynamic flux of signals and symbols which can accompany perception of a simple church, we must allow that
"structures of meanings" are also characteristic of environmental images. In fact, if we accept the three categories of "sense" or "meaning" outlined in Paragraph 19, which include the purely formal identities of category I(a), then we might argue that environmental images are wholly structures of various kinds of sense or meaning.

25. There is a lot of truth in Roger Fry's comment that "in actual life, the normal person really only reads the labels (i.e. the conventional signals) on the objects and people around him, and troubles no further".26 Thus Vernon,27 discussing the everyday perception of real objects, corroborates Moore's findings that observers were "not aware of sensations of light, color, etc, as such, but that the primary state was the awareness of meaning". In this kind of perception, "evaluative processes may be particularly important". Is it a threat to me or will it be useful? This is the most basic kind of meaning which any animal must know or learn to deduce from its perceptions of the everyday world. Once survival is assured,
evaluative processes can turn to "higher" questions, such as "do I like what I see, shall I linger or go on?" Once these kinds of evaluation, basic to survival and security, have been settled or dispensed with, it is possible for human intelligence, given suitable raw material of sense-stimuli, to proceed to imaging more complex structures of meaning, derived, for example, from the indulgence of curiosity, aesthetic sensibility and so on, through a variety of attitudes and motivations.

26. Arising from the foregoing paragraphs, therefore, is my first hypothesis: that indivisible processes of perception and conception, applied to the constellations of sense stimuli coming from the physical environment, produce mental structures of identities, impressions, signals and symbols, which mesh together at many levels in the perceiver's mind, in response to momentary attitudes and drives, to form his "environmental images".

27. The second hypothesis is that the dynamic structuring of environmental images within the brain field produces "orientation", which is both "physical", in the sense that it is an aid in way-
finding, and psychological, in the sense that it helps to determine, along with what he reads and what he hears other people say, his conceptual and emotional "world-view", or "sense of reality". It seems axiomatic that no animal can survive without the minimum degree of physical orientation necessary for the satisfaction of basic drives, and that a human being likewise needs for bare survival some minimum degree of both physical and psychological orientation as well.

28. The third hypothesis deals with the effects of these two types of orientation upon behavior and upon the development of personality and culture patterns. Firstly, a person or a group can only exploit the opportunities available in the physical environment according to the sureness and comprehensiveness of physical orientation achieved. Secondly, "psychological orientation", "world-view", "images of reality", "ways of seeing the world", and Cassirer's "space of myth" are various names for the hypotheses about what is really real to which individuals and culture-groups adapt their personalities, and on the basis of belief in which they act.
It will be noted that this series of hypotheses links individual and culture patterns of behavior and development to the stimuli impinging upon the senses coming from the physical environment, and therefore to the physiognomy of the physical environment itself.

29. At the core of thesis is the concept of discernible relationships between physical environment as habitually perceived and habitual behavior and the tendencies of personal and cultural development. The germ of this idea, as I have briefly indicated, is contained in the work of the early Gestaltists. It has been adventurously elaborated into mathematical models by Lewin, and is at the base of the Transactionalist position, presently being maintained by the Princeton Psychology Research Center.28

30. Transactional theory has been broadly summarized thus: "an individual at any moment can be aware of the reality in which he must act only by a sub-conscious integration of all his experience in the past, of what he and his environment are
trying to do at the moment and of the anticipated future results of this individual-environment transaction." 29 (Transaction was Dewey's term to describe this way of looking at behavior.) Perception has usually been interpreted as an isolated human experience of isolated stimuli through isolated senses. In opposition to this traditional way of dealing with it, the Transactionalist position is that perception is a process embodying an individual, his past and future action, environment and its past and future, all wrapped up in one transaction. "The storehouse of the past carried by each individual has been labelled the 'assumptive' or 'form' world. These 'forms' have future probabilities in one's 'assumptive' world. 'Guesses' are made on these, action based on them." 30

31. At first sight, this formulation seems to partake of early 'associationalist' theories, so painstakingly refuted by the Gestaltists. But the conflict is resolved if the "forms" of the "assumptive" world are considered to be at
the same high level of abstraction as the "environmental images", and "cognitive maps" with which we have dealt herein. Each of these concepts has strong affinities with the postulated "psychological life-space" of Lewin, defined in his "Principles of Topological Psychology".31

32. "The basic idea of a person in an environment", writes Lewin "is, in its conceptual content, a statement of a certain topological relationship between two regions" and "the dynamic interdependency of two regions implies that the state of one is influenced by the state of the other". This "dynamic interdependence" of a person in an environment makes up what Lewin calls, following the earlier Gestaltists, the "whole situation" which varies with the desires and needs, or, in general, with the "state" of the person. The concepts of "environment" and "situation" are operationally defined: one can treat everything as environment in which, toward which or away from which the person as a whole can perform locomotion; and the situation is to be treated as the totality
all possible and not-possible behavior and events.  

33. Lewin set out to find techniques for representing the structure and processes of both momentary situations and of the totality of situations — i.e. the "life space", in terms of topological mathematics and psychological dynamics. Momentary situational space is to the life space as, say, a short story is to a complete novel encompassing one or several complete human lives. Lewin represents the psychological space of many simple situations involving an individual only momentarily, while at the other end of the scale, he has represented the psychological life spaces of a community of Jews living in a ghetto situation, contrasting these with the life spaces of the same kind of group dispersed throughout a wider physical environment.  

34. "Objective" characteristics of the physical environment are included in the representations of psychological life spaces only to the extent and in the manner in which they affect the individual or group in the situation being studied. The characteristics of the physical environment so
included are called "quasi-physical facts", the dynamical criterion used for their selection being that "what is real is what has effects". 35 This means that consciousness of some element of the environment is not the sole criterion of what belongs in the psychological life space at a given moment, a point previously stressed in my argument of this Chapter. Then, postulates Lewin, Behavior is a function of the Situation — the minutaee of momentary behavior a function of each momentary situation, the norms and probabilities of behavior over longer periods a function of the psycholgocial life space of the group. But the Situation is a product of a dynamic interrelation between Person and Environment, a statement which follows the argument of paragraph 14 hereof. Therefore, Behavior is a function of Person times Environment. This construct becomes of prime relevance to urbanism when it is seen to demonstrate that if the Person and his attitude are kept constant, then Behavior and Environment vary directly according to one another.
It appears that Lewin has provided a theoretical and mathematical basis for experimental investigation of the E-M-E construct. His concept of the quasi-physical facts of the psychological life space, which affect human behavior, is closely related to the concepts of environmental images and psychological orientation. The focus of my own present work is neither upon psychology nor upon urbanism, but upon the processes which enmesh the two, and Lewin seems to have come nearer to this focus than any other worker so far in individual or social psychology.

35. The material of Chapters II and III has taken us through the cycle of the conceptual model of Man-Environment interactions diagrammed on Plate II. Let us now recapitulate.

36. In any person-environment situation, each is the product of a totality of past experiences and events, of what is usually talked about in terms of history and cultural anthropology. The person (or group) participates in and so is able to perceive the forms of that environment, attaining over time to a series of generalized images, 60.
the character of which is strongly influenced by the inner self of the person, or by the pre-existing cultural patterns of the group, as well as by the motivations and attitudes that are characteristically dominant in person or group while perceiving the environment. After these perceptual images are matched with the powerful impressions of the world gained through written and spoken words, the person or group attains to a degree of physical and psychological orientation.

37. Some ability in way-finding is always necessary for the mere survival of a freely mobile and independent individual or species. Some stability in psychological orientation is also necessary for survival, at least to human beings and to human communities. Shared environmental images give rise to shared orientations, aiding social cohesion, making communication and emotionally safe relationships possible, rendering organized activities of all kinds possible. Indeed, the mere survival of any isolated individual or isolated tribe presupposes the attainment of a relatively high
degree of "sufficient, safe, clear, economical" environmental images and orientation. But qualities such as these may ensure survival and nothing more. Lynch points out that a static and rigid environmental image, such as appears to be held by some Australian aboriginal tribes, for example, hampers individual and social "development". Too many taboos of any kind can be seriously restrictive. "Open-endedness" is a highly desirable quality in an environmental image, for as Lynch suggests, a value placed on "development" would also attribute value to an image "adaptable to change and able to furnish the individual with a springboard for the further investigation and organisation of reality." I have treated this idea as the key to a dynamic process of "development".

38. Mine is a theory of development and change in the character of responses by an individual or group which inhabits a given physical environment. Conversely, it is a theory of the development and change in the character of a physical environment, that is dominated by a given individual or group. This makes for a continuum of thesis and antithesis,
which I submit must be acknowledged as operating in cultures that are not stagnant, or among groups which are not homogeneous nor entirely restricted to a single area of physical environment over generations.

39. The model (Plate II) therefore shows, in its second stage, how both the human and environmental factors in the process may be said to change and develop. Younger people tend to move about exploring new kinds of environment, either on the grand scale of movement from one region to another, or on the more intensive but narrower scale of investigating the multitudinously different types of environment available in a single metropolis. They modify their environment, in effect, and become reoriented after doing so, thereby changing something of themselves; in many cases this change can be given the honorific title of "development" for the better, for it implies an intensifying and broadening of their experience of what is really real.

40. "Developed" persons may be said to have acquired values and goals as the inevitable accompaniment of a more or less settled psychological
orientation. When they come to act — to build, to
design, to choose, to vote, to spend — these values
and goals interact with the range of possibilities
in environmental design which they are capable of
imagining. Policies and plans arise out of this
generally confused interaction and something gets
done which changes the physical environment, in hard,
cold fact, and the cycle begins afresh for the next
generation. Thus are our men and our cities made in
the images of each other.

41. This conceptual model attempts to describe
the universal relationships which may be said to
exist between individual and group behaviour, on
the one hand, and the perceptual form of the physical
environment on the other, so as to admit of no excep-
tion, to encompass all that can and does happen.
We have seen that the relationships are neither
simple nor wholly deterministic, being matters
rather of tendencies and probabilities which operate
when "other things" are more or less "equal".
Nevertheless, an element of determinism is unmistake-
ably present, but it is of a complex and spiralling
kind, in which events and influences are inextricably
linked into a continuum operating simultaneously at different levels.

42. A striving for lucidity in argument has dictated the use of examples dealing with individual people, but the element of determinism claimed in the hypothesis refers only to the highest common factors of responsive behavior over large groups of people and of the abstracted expressiveness of environmental forms at a broad scale. Emphasis upon the socio-statistical context is not only necessary for any meaningful hypothesis about human behaviour but it is also the aspect of human behaviour with which practical politics and practical government are concerned when these activities try to define the public interest through law and administration. Emphasis on the general character of physical man-made or humanized environment is the concern of architecture, urban design and city planning, for each tries to satisfy particular functions and goals through particular arrangements of forms. One therefore expects that the hypotheses with which we have dealt will have some relevance to all those activities concerned with the public interest,
social goals and social functions. This potential relevance is discussed in the next Chapter.
IV. RELEVANCE OF THE HYPOTHESES TO THE PUBLIC INTEREST

Once we attain to any kind of self-consciousness about the causes and consequences of our acts, especially when the causes, acts and consequences are linked together in a chain reaction of evolutionary processes, then we ought logically to think how we are to adapt ourselves to our new and usually disturbing self-consciousness. What might once have been allowed to occur as a haphazard, unconscious or an arbitrarily dictated series of unrelated events can no longer be thought of as such. If it is true that the perceptible forms of landscape, metropolitan regions, cities, towns and even individual buildings do in fact echo through the minds and behaviour of those who live among them, then some degree of social responsibility devolves onto every act which helps to shape them.

If we recognize that the great majority of children in our society are growing up in metropolitan environments, which are today the functional units of industrial civilisation, and that the character of these environments somehow influence their maturing character, attitudes, their ability
to choose and the range of choice available to them, then we are confronted not only with questions of which environmental forms give rise to which typical responses under which circumstances, but also with whether any agreement can be reached, in practice, on which responses are to be desired, and consequently, upon which forms are to be encouraged, at any particular time.

Consider the example quoted at the conclusion of the last Chapter. Many youths grow up in our metropolitan wastelands, their perceptions of which one would expect to be characterized most often by image structures of low-gestalt - exhibiting "gestalt-qualitaten" dominated by the isomorphs of violence and chaos. Economic and social barriers, as well as an inhibiting lack of physical orientation over the wider metropolitan region, tend to confine their patterns of participation to this inner slum environment, and within the range of effect of its characteristic perceptual impacts. Thus few of them make and develop the accidental contacts with other persons, groups, places, institutions such as libraries, which could lead them into the collective memory of
a wider community. Instead, isolated, they must rely heavily on their direct environmental perceptions in order to build a psychological orientation which copes in one way or another with reality as they see it each day.

Is the nihilism and seemingly irrational violence of so much juvenile delinquency really to be seen as a rational response to a "sense of reality" derived from the perception of a distorted environment? Can the organization of "gangs" in "territories" be understood as an attempt by isolated and disoriented adolescents to impose order on their environment? Can, therefore, urban planning, and design, extend choice, invite extended participation, make surer physical orientation, effect changes in psychological orientations, and do away with unnecessary and anti-social 'do-it-yourself' efforts to create order out of chaos?

Enough 'public housing' has been built by now seemingly to disprove earlier suggestions that the provision of sanitary and efficient barracks would change many kinds of anti-social behaviour to any large extent. Does the key lie in the overall
perceptual form of a residential area rather than in the mechanical standards of accommodation and sanitation? Is the overall character and form of the neighborhood and city as a whole even more important to this issue? These, and a host of other questions arise even in the most cursory examination of the 'delinquency problem' and might repay serious investigation.

Another highly relevant example comes from Floyd Hunter's enquiry into "Community Power Structure". In this case-study of a southern U.S. 'Regional City', Hunter divided the men of influence of the city into "power-personnel" and the much less influential "professional-personnel". Home-location maps show clusters of the power-personnel living in the "highly-desirable areas" while the mere professional-personnel are grouped in merely "desirable-areas". Hunter concludes that the home locations of the men of power, and the routes over which they drive to work, (i.e. their participation patterns) isolate them from the mass of people and the problems those people must face in their neighborhoods each day. ¹

The men of real power rarely, if ever, pass
by and see the blighted and poor sections of the city, but the professional men do so much more frequently, and they are the ones who bring community issues before the men of power so that decisions and actions may be taken. "It is true", writes Hunter, "that the professional men turn into pleasanter suburban streets at the end of their homeward journey, but most of the route is depressing to anyone sensitive to social disorder. The smoke pall, grassless yards, unwashed children rolling abandoned automobile tires as hoops, grey dogs and the bargain clothing emporiums are constant reminders of decisions which press for attention..." Hunter concludes that the images held by groups residing in different parts of the city may consequently vary, and notes that "physical structure may thus affect social structure and its functioning." He summarizes thus: "There is an interaction between the physical characteristics of the community and the patterned actions of men. The physical structures, once created, act as passive barriers or channels for the dynamic actions of men."²

American cities today are commonly said to face a "crisis of leadership". Strenuous efforts are
being made to entice powerful private citizens back to their traditional roles as community leaders. The campaigns for "citizen participation" in the planning and local government process aim at bringing together representatives of all sectional groups and interests into broad committees, in order to remedy the stultification of cooperative action which seems to have occurred over recent decades. This stultification of cooperative action seems to have gone hand-in-hand with the general decay of inner metropolitan areas, as well as with a growing rigidity of segregation into residential areas along, income, class, ethnic and other lines, throughout the whole metropolitan area in many cases.

Is this kind of segregation and huddling together a symptom of a withdrawal from the insecurity and general decay of the wider environment? Does general environmental decay encourage this segregation? Does this segregation itself lead to a breakdown of communication and understanding between groups and therefore to a further breakdown of cooperation? Is the breakdown in communication partly to be explained by the inability of one segregated community to perceive directly and continually how other kinds of people live? Affirmative
answers to these questions would reveal a vicious circle to be operating to the extreme detriment to the public interest.

Assuming that there is nothing intrinsically wrong with 'birds of a feather flocking together' in the residential sectors of a metropolis - indeed, assuming that there are many reasons for it to be socially desirable as well as natural - then one might expect that during the course of journeys hither and thither about their metropolitan region, otherwise segregated individuals would have plenty of opportunities for seeing how other people live. But does the present manner of freeway planning and design facilitate this kind of perception? Do, rather, many of the newest types of freeway effectively hide from the motorist almost all perception of the metropolitan districts through, over, under or around which they pass? Hunter claims that this is the case with the "Pine Grove Expressway" which is daily used by the men of power in "Regional City". Residents of arcadian suburbs or sylvan exurbs, who do not use public transport but who drive far and wide on the freeways, may possess an excellent sense of physical orientation at the regional scale, but
their psychological orientation towards that region may be completely inadequate or distorted. This kind of inadequacy or distortion may be most serious in those young adults, all of whose driving and all of whose metropolitan "participation", has been accomplished since the major freeways in their region were built.†

Image distortions perpetrated in this manner can seriously damage social cohesion. If they infect leaders, they are of course far more potentially dangerous to the public interest. Even if they only infect some segments of the general public, they destroy the basis of a common "assumptive world" or

†A vivid contrast of extreme opposites in metropolitan perception appears from the comparison of the freeway approach to the heart of a modern metropolis (see Appendices) with the experience of Oliver Twist in Dicken's Chapter XXI. Oliver approached London by coach as the sun was rising. He was enthralled by his true cross-sectional view of London and its people. An Oliver today might be enthralled by the sweeping technology of the freeway, but little else could be communicated to him as he rode in. To compare the two city-entries to the detriment of the modern example is not to condemn the latter entirely, but merely to point out that a traditional opportunity for a "synoptic" view of a metropolis is endangered by the design of many modern freeways. Cf., Eisenstein's enthusiasm over Oliver's journey, in Sergei Eisenstein, Film Form (New York: Harcourt Brace, 1949), p. 214.
"sense of reality" which the public as a whole needs in order to be able to isolate, agree about and act on issues and problems.

A third example is one where a regional planning authority has, in fact, recognized and acted upon an assessment of the public interest such as I am advocating here.

The 1956 Stockholm Regional Plan embraced the concept of "mixed suburbs", abandoning the old-established planning principle of a rigid segregation between industrial and residential zones. Among other reasons for this change, a prime consideration was that "children who grow up in a purely residential area obtain an unreal conception of the community in which they live... their intellectual and emotional development and the direction of their more mature interests ... require the more direct entry of productive work into their field of experience."³

Examples of the practical relevance of my hypotheses to the daily assessments of the public interest which, in actual practice, politicians, administrators, planners and designers all must make, could, I submit, be endlessly multiplied. I will now attempt ⁷⁵.
to construct a framework of politico-ethical goals, a valuational scheme at a high level of generality, which would be broad enough to encompass all situations in which questions of environmental design would be relevant to the public interest.

It is popular to suggest that "survival" should be the first criterion for judging the adequacy or operational success of valuational schemes. I submit that survival of a species, or of any social group, depends on cooperation and mutual aid among members of the species or group. We have no evidence for believing that the lone wolves and the lions have proved to be successful species. But there are two kinds of cooperation at stake here: one is with the demands and opportunities provided by the given environment, i.e., a process of adaptation; the other is with fellow members of the same species or group, directed towards the creative evolution of a more favorable mutual environment. Whitehead is an effective spokesman for this view: "Firstly, the influence of each organism on the environment should be favorable to the endurance of other organisms of the same species. Further, if the organism also favors the development of other
organisms of the same type, then you have obtained a highly practical and enduring process ... With cooperation, and in proportion to the effort put forward, the environment has a plasticity which alters the whole ethical aspect of evolution."

It seems obvious enough that cooperation between individuals and between sub-groups of a community depends firstly upon the facility of communication which they share, and secondly upon the degree of mutual understanding or common belief which arises out of their efforts of communication. For all its faults, language is the most practical, and most employed, form of communication we have; but I have been at some pains to demonstrate that direct face-to-face perception, confrontation between person and object, between person and place, has qualities and powers which, quietly and unobtrusively, are at least as effective as language itself in effecting communication and bringing about understanding.

There is no substitute for the direct perception of a thing; a truism borne out by the experience of everyone who has travelled in far-off places which were previously exhaustively "known" only through books,
photographs and movies. Environmental perception, therefore, constitutes a goodly part of the "communication" process which is essential to the functioning of organized "democratic" communities, where people need to understand each other and their joint situation, and to develop those "group images", "myths" and "ideologies" which form the basis of coöperative endeavor in the creation of environments ever more favorable to them.

Communication in this context denotes the kinds of sense derived from the senses which I have analysed in Chapter III. These were briefly, physical facts, expressive qualities, conventional "labels" and signals, as well as the "intrinsic" significance and symbolism of the "essential human tendencies".

Thus the physignomy of the physical environment is one of the major media of communication which we possess. The public has a vital interest in its use and mis-use in much the same way as it has an interest in television networks, newspapers, public libraries, and art museums. Each of these institutions performs a diverse cluster of functions, one of which in each case is the communication of information, opinion, feeling and so on. Formal
education is also largely an organised communicatory process over which the public exercises a strong control. If we can agree to regard environmental perception as a form of social communication, then public action to improve the efficiency and quality of some parts of that communication is as justified as it is with regard to the school system.

A well-laid out metropolitan region of high imageability, in which the functional structure of interlocking land uses is directly visible through perception, has many obvious practical advantages to its inhabitants. It saves time and money if people can find their way easily, as well as saving their tempers. Again, people who are highly aware of what is where, of what is going on in different places, and know how to get there, have an extensive range of effective choice between the activities and opportunities that are readily available to them. This kind of freedom of choice over a wide range of possibilities is an important part of a child's development. A child needs to be continually expanding his patterns of environmental participation
in ever-widening circles from his home; the physiognomy of the physical environment can effectively aid him or block him in much of his attempts at exploration.

The ease of awareness of functional structure is most valuable, therefore, as a means to other ends, such as being able to exploit the multitudinous small and great opportunities available in a crowded urban area. But the public interest is not necessarily served by maximizing awareness itself, lest all interest, privacy, mystery, challenge be lost. Nor is it served by maximizing all the messages which can be transmitted through environmental perception. Maximum awareness can be debilitating; maximising communication at random is self-defeating. Examples of these might include some plans for new towns where everything is arranged in logical and orderly form according to a powerful but over-simple vision of what social life ought to be like, as well as the much more frequent profusions of advertising signs and hoardings along almost every shopping street, where so much is said that nothing is heard. The goals for this kind of communication, then, would be along
optimize the amount of communication while minimizing the unit cost in effort expended per message or per impact.

I have previously pointed out that effective cooperation depends upon effective communication; it now appears that one of the things which the public interest would demand expression for in the physiognomy of the physical environment would be the virtue of cooperation itself, both as a means and as an end. This requires something more than the straightforward kind of cooperative accommodations which are part and parcel of the ordinary processes of functional land-use planning, but also the expression through design of how various land-uses support and relate to each other. Furthermore, it implies the conscious symbolizing of cooperation as an abstract quality of great social and cultural importance, requiring special formal emphasis in the location and design of particular buildings and land-uses.

In practice, of course, there is no more a simple way of getting people to agree on what will be symbolised when, where and how, than there is getting agreement on any other social or political issue.
But it would be greatly in the public interest if the kinds of issues raised by the ECMKE hypotheses could be more fully considered than they usually are before action is taken on matters both large and small affecting the physiognomy of the urban environment.
The most artificial, the most man-made, physical environment of all is that of the variously named "metropolis", "urban region" or "metropolitan region". This is the environment in which an ever-swelling proportion of the world's population is living. It also happens to be the environment in which I myself have lived most of my life—chiefly in Sydney, London and Boston. These three names represent the kind of concrete phenomena which I choose here to call "metropolitan regions". The concept is difficult to define with precision and yet with brevity. I accept the more or less operational definitions and descriptions given to the concept by ecological geographers such as Robert E. Dickinson and by the more recent American formulators of the "economic base" techniques. The further to make my possible bias clear, I should say that I sympathize with the beliefs of many urbanists, notably Clarence Stein and Lewis Mumford, that the 19th century type of metropolis will and should evolve into a "nucleated constellation" of urban areas, together forming a "regional city".
Since "metropolis" literally means "mother-city", we need first of all a broad definition of what a city is and what it does. For the present purpose, I propose to adopt Lewis Mumford’s recent definition of the "true function of a city", namely: "to bring together within a limited space a diverse and varied group of people who, by their meeting, clashing and cooperating, will achieve results in their own minds and in their activities which they could not possibly have achieved alone" and also "to bring together within a common theater of action and of focussing, as in a dramatic plot, the purposes of varied groups and personalities". It is both a pre-requisite and a natural consequence of this function that a city is a focal area of maximum accessibility wherein activities of the highest specialisation and widest diversity are carried on. At any regional scale, the point or points which happen to be of maximum or greatest accessibility, wherein a diversity of specialised activities is carried on in the way Mumford describes, can be said to be perpetuating the true and traditional "city" function; I assume that, in the future as well as in the past, there will always be some point or points within a closely settled region which will exhibit higher levels of intensity, diversity and specialisation of activity than
are average for the whole area of the region. Wherever such points exist and function in these ways, then they may most appropriately be called the "core" or "cores" of the region.

We now need a broad definition of what a metropolitan region is and how it may be said to operate. Literally, it is a region exhibiting or containing the characteristics of a "mother-city", or, in other words, a central core of activities on which a series of sub-cores are dependent. It is a region in which a very large number of people (normally one or several million) live within a more or less contiguously built-up or developed area around and between a central core of activity and its sub-cores.

A considerable percentage of those people now flocking to live and work in the suburbs of the great "mother-cities" don't do so because they wish to participate in the "social drama of urban life"; many of them, in fact, have goals quite opposed to this, but they are both thrust and drawn towards the great agglomerations by a variety of economic circumstances, one of which is their own desire to share in the prosperity which metropolitan concentration produces. To the extent that such people become inextricably linked to one another, and to the central city or core, by daily
economic ties of production and consumption in trade and industry, particularly in tertiary or service activities, then the total area they inhabit may be said to constitute a "metropolitan region".

The foregoing will suffice as a very simple series of definitions of the physical environment on which this enquiry will focus - that is, the contemporary metropolitan region, and the point or points of the highest concentrations within it, the core or cores.

Two aspects of the metropolitan region definition should be especially well noted. First, it cannot be used to describe an area within which a very large number of people are closely settled but whose activities, economic activities at least, are not more or less enmeshed into a single web. Thus it would not describe a closely sited group of small cities or towns whose day-to-day economic activities were largely independent of each other or of the region as a whole. It is not clear to what extent, if indeed any, this sort of situation exists now and yet goes unnoticed in some of the larger "urban regions".

The second aspect of the definition to be emphasized is the limiting factor implied by use of the word "daily".
Perhaps the simplest example of an economic linkage which is refreshed daily is the journey to work; another is the delivery of a newspaper from a central press to an outer suburban home, yet another the daily distribution of perishable goods from a central market. It is just this emphasis of continuous reliance upon certain shared facilities which distinguishes the metropolitan community from, say, a larger State or National community. Jobs, printing presses, food and water distribution systems are among those daily necessities which are vital at the scale of metropolitan regions.

The geographic limits of a metropolitan region are variously determined by the average, or the maximum, or the economic optimum distances over which these activities can be carried on daily, without strain either upon the mechanical facilities or the human energies involved.

The transportation network is therefore the most important basic element tending to determine the size and many other characteristics of a metropolitan region and its cores. The average speed of available commuter transport, for example, multiplied by the
average time an average man is willing to devote to commuting, yields the average radius from any concentration of job opportunities at which metropolitan settlement can be expected. The number of inhabitants to be found within the radius will depend, among other factors, upon the average density at which people generally are prepared to live, given a certain level of construction technology and design skill.

To summarize this very broad description of the essential characteristics and functions of a metropolitan region would be to say that the metropolitan region encompasses a true "community" of interdependent interests shared by all its inhabitants, and that its physical environment is controlled by an overall "scale", which is at the same time a scale derived from technology, a scale derived from the rhythm of the sun and of the seasons, and a scale derived from the human limitations of its inhabitants.

One of the most highly revered judicial principles is that "not only must justice be done, but it must also be seen to be done". Observance of this principle is responsible for a great part of our legal system being
as complicated as it is; from the lowest Court to the highest, the dispensation of justice is, or tends to be, a highly stylized procedure, the intricate steps of which are designed to express and to safeguard the essential spirit and significance of traditional or Constitutional guarantees, and also to communicate these ideas. To paraphrase the jurists:— "not only must a metropolitan region function as an integrated community, but it must also be seen and comprehended as doing so".

The word "must" in these contexts conveys the concept of "necessity". The jurists infer that without some degree of widespread confidence in, and comprehension of the forms and acts of the law, then the legal system would collapse. Moreover, the jurists imply, this comprehension must be gained directly through what people see, hear or read of the ways laws operate. In the same way, without some minimum degree of widespread comprehension of the form and inter-relationships of a metropolitan region, it could not function properly, if at all. Now there is a great deal of evidence that many metropolitan regions are indeed teetering on the brink of functional breakdowns, and that few of them are functioning as well as they could. This can partially,
at least, be attributed to a widespread lack of any realistic understanding of what a metropolitan region is, and of how and why it operates.

John Dewey was able to isolate this problem over thirty years ago:— "the machine age... has invaded and partially disintegrated the small communities of former times without generating the Great Community". In Dewey's terms, the present metropolitan "crisis" is basically due to the inability of the metropolitan "public" or "community" to "identify and distinguish itself" as a complex unity of "conjoint and interacting behavior".

Two major remedies are commonly advocated and are being increasingly attempted in many parts of the world. One is politico-economic re-organisation of governmental and taxing structures at the metropolitan level; the other is functional land-use planning at the metropolitan scale. But the focus of my present study is neither upon politico-economic organisation nor upon functional operations; these will be mentioned herein only to the extent that physical expressions of them can be directly perceived as one moves about within a metropolitan region. Nevertheless, studies of this kind
could reasonably be expected to reveal connections between the shapes and visual character of the physical metropolitan environment, on the one hand, and the extent to which metropolitan dwellers comprehend their distinct identity as a community. If something like this were to be uncovered, then it would open up new avenues to be explored for practical techniques of environmental visual design at the metropolitan scale.

There are now sufficient metropolitan regions the world over for a random choice to yield evidence of common features such as have been outlined above. Nevertheless, wide disparities of wealth and technological status between nations make difficult the choosing of a single metropolitan model of world-wide validity. Which particular metropolitan region could best serve as an example for purposes of study and observation of the typical metropolitan physical environment?

**Boston** happens to be nearest to my hand at this moment, and it also has many advantages as a testing ground. It is one of the older, more middle-sized and less rapidly growing of U.S. metropolitan regions, and so has more in common with most other metropolises
outside the United States. If we restrict ourselves to the confines of industrialized areas, then we can say that Boston stands half way, so to speak, between, say, the extremes of Los Angeles and Milan. Furthermore, Boston has traditionally been a meeting-place of European and American attitudes, both of which are represented and expressed by various parts and characteristics of its physical environment.

I will now present a study of some of my own efforts at "image-building" in the Boston region. It is a "pilot" study in the sense that it is more concerned with demonstrating concrete examples of the kind of things a full study would cover, rather than with exhaustively covering these things. Even then, it is a study made by a single detached observer, isolated from people around him who live and themselves develop within the environment of Boston, isolated from the people who developed it and from those who are continuing its development. Lacking the resources for a more complex kind of study, I have restricted myself to a simple preliminary survey of a "cross-section" of the Boston metropolitan region.
A "cross-section" denotes a direct cut through the middle of something, from one side to the other. It is also taken these days to signify a roughly balanced sample of a highly diverse collection of different people, types or things. In this context, I use the word in both senses, for I propose to concentrate my observations in the western, or west-north-western, sector of the Boston region, north of the Charles River. This sector provides an excellently diversified sample of the "typical" metropolis, and through it run two major roads from the rural fringes to the regional core, each of which is a true line of metropolitan cross-section.

Even though my concentration on this sector and these roads is dictated to some extent by expediency, it seems fairly obvious that travel along these routes through these areas would form the heaviest part of the "participation patterns" of many people - those residents who live, work, shop, go to school and college, and who travel for many other purposes daily along this cross-section. Many of the people thus exposed daily to the sights and sensations of these western routes would perhaps rarely ever venture into other sectors of the Boston region.
Massachusetts Route 2, the Cambridge-Concord highway, is the present spine radial of this western sector of Boston region. Across the Charles River basin from the core of the metropolis are the decayed inner suburbs of Cambridge and Somerville, with their slums, universities, railway yards, warehouses and industries. Then come the middle range of mature suburbs, perhaps now embarking on the voyage of decay - Watertown, Belmont, Arlington and Medford. On the fringe of the contiguous-ly built-up area of Boston region in this sector are the outer suburbs of Waltham, Lexington, Winchester and Woburn. These areas lie within the arc of the circumferential expressway (Route 128) and beyond lie the satellite towns and ex-urbs of Lincoln, Bedford and Concord. The latter is the most distant, being a little more than twenty miles from the metropolitan core.

The sector is mainly flat, yet contains a random disposition of swamp patches, large ponds and small hills, the highest rising to an elevation of 370' above sea level (in Arlington Heights).

Settlement began in a scattering of independent towns which have coalesced into the typical metropolitan "octopus" without altogether losing their political
autonomy.

A journey into the center of Boston from the west reveals a highly conventional metropolitan cross-section. Beginning with the scattered ex-urban dwellings and, in season, the roadside produce stalls, building becomes more aged, more dense, more coarse-grained and taller as one approaches the core. So does the amount of visible human activity increase, and the traffic intensify.

Boston is a "New World" metropolis and so does not complicate our view by exhibiting extensive residues of too many centuries, or of more than one major civilisation. Yet there has been sufficient technological and social change in Boston to provide evidence of the implications for human perception of change in the man-made environment.

The western sector displays an accretion of urban forms from succeeding periods. More than 150 years yet less than ten miles separate Beacon Hill from Six Moon Hill. In between lie many other kinds of housing and of architecture, together with the "Main Streets", church spires and Commons of the older towns. Most recently, there has appeared the hygienic monumentality of the
circumferential expressway with its proud new factories and offices.

The social and physical emphasis on mobility in American life is amply demonstrated in the western sector of Boston region by a proliferation of railways, subways, trolley lines, ribbon developments, boulevards, quasi-expressways and the latest type of turnpike thru-way. Indeed, the existing mixture of these elements in the sector is the equivalent of a history book describing the development of transportation and mobility over the past century or so. One pattern has been laid across another older one as need demanded; the old co-exists with the new, and this mixture is a source of much visual and psychological confusion.

The early twentieth century ribbon development of Massachusetts Avenue and its related railway line, both of which run through the old town centers, have been paralleled by successive types of limited access highways, each one more limited in access and designed for higher speeds than the last. These new roads tend to be located in whatever wedges have been left previously undeveloped, between the built-up areas.

Fortunately we can extend our view of these evolut-
ionary changes into the future. The Massachusetts Public Works Department has clear policies and fairly settled plans for the rapid construction of a unified expressway system over the entire region. Sections of it are already in use, notably Route 128, a rare working example of the outer ring-road concept which has been so dominant in metropolitan planning theory for twenty years, yet was never executed to such textbook perfection as here in Boston. Route 128 has provided since 1951 an effective, high-speed circumferential expressway around the outer edge of the main metropolitan mass at a radius of from 11 to 14 miles from the core.

While planning and action for highway development at the metropolitan scale is well under way in Boston, no other aspect of metropolitan development is yet being treated so comprehensively.

There is no fully "motorized" regional-scale shopping center in the western sector of Boston as yet, mainly due, perhaps, to local opposition to proposals for a site at the junction of Route 2 and Route 128. However, two excellent examples exist elsewhere in the region: "Shoppers' World", an older type, set amidst...
the "roadtown" of Route 9 to the south-west; and
the newer North Shore center, standing in splendid
isolation off Route 128 in Peabody. The general
ideas arising out of the pilot-study, concerning the
strategic elements of perceptual form and meaningful
character at the metropolitan scale, are discussed
in the concluding chapter.
VI- SOME ASPECTS OF A METROPOLITAN IMAGE

One purpose of the pilot-study was to explore the categories of "sense" which could be derived from ordinary environmental perception in a contemporary metropolis, by a person who, while not a complete stranger to the general culture-patterns which had formed the metropolis, was, nevertheless, a relative newcomer to the particular region involved. The analytical categories of "sense," derived from the pilot study, have been presented in Chapter III. The detailed descriptions of the two cross-sectional metropolitan journeys taken for the pilot-study have been relegated to the Appendices. The descriptions of the journeys substantiate, to my satisfaction at least, the validity of my arguments concerning the communication of various kinds of "sense" through environmental forms, but the reader may judge for himself after reading the journey descriptions and studying the photographs.

Another purpose of the study was to isolate, if possible, the strategic elements of metropolitan form which are probably most vital to orientation at the metropolitan scale, to see what differences
might exist between image-making at the metropolitan scale as distinct from the city-scale, for the latter had already been investigated by Lynch. The study revealed nothing to contradict, and much to support, the conclusions of Lynch's draft Chapters on *The City Image* and *Implications for Urban Form*.¹

A third purpose was to gather leads worthy of more strenuous empirical investigation aimed at testing the EcMxE hypotheses. The only kinds of relationships the study was able to draw between behaviour and the perceivable forms of the physical environment were at the broad scale of what seems to be typical or expressive of the Northern United States or perhaps of New England, except in a few instances where my own personal knowledge of districts or institutions allowed me to be a little more specific. To someone more acquainted with the history of physical development of Boston region, however, the perceived forms may be more communicative. Once again, there are many possible leads scattered throughout the route descriptions, which the reader may judge for himself.

An entirely different kind of study could
be made if the collaboration of social and individual psychologists was available. A more comprehensive project would entail the collection of "participation patterns" of individuals year by year, and the correlation of these either with "depth" interviews or with the record of decisions and action, undertaken by those individuals, which directly affected the physical environment. It would be particularly significant for urban studies if the individual subjects past age 30, were men in positions of power and influence over the type, location and design of public works, or of large private projects.

The major conclusion of the pilot-study was that there is only a bare minimum of perceptual form in the Boston metropolitan region at present, although the projected expressway network may tend to impose a degree of order at the regional scale. The degree of "imageability" in Boston seems to be somewhere near what one might call the bare minimum to support any kind of social cohesion or functional efficiency at all.

It is possible that there is a connection between the difficulty of image-ing a region, and the
improbability that the inhabitants of that region will spontaneously accept metropolitan political unity or local governmental coordination at the regional level. There certainly seems to be an extra-ordinary coordination resistance to these ideas in Boston region, a resistance usually explained by reference to the New England traditions of fierce independence among small local communities. It seems obvious, from the record, but also from what one can see today in Boston region, that this tradition has resulted in many of the older communities having something of a separate identity, a distinctive character. It may be that this perceptual separateness now tends to perpetuate political independence. If this is actually happening, then only some act of free-will, a kind of Operation Bootstrap, will set in motion the needed process of metropolitan government and planning. It is often said that cooperative action is badly stultified in Boston region; many people despair, or simply do not ever hope, that metropolitan problems will be recognized for what they are, and acted upon. This may be due more to the lack of a common basis for understanding and action between the
various ethnic and class groups in the Region, groups which appear to have been in fairly serious conflict for about fifty years. The struggles between the "Brahmins" and the Irish, played out against a background of Boston's decline as a port-city and the entrepreneurial center, are the major theme of many stories a newcomer hears. The Anglo-Americans, the Irish, the Jews and the Italians are among the major groups which have tended to concentrate themselves in specific towns and districts in the region, tending to give those districts a somewhat distinctive character of their own, carrying over into the new environment those values and ways of living traditional to the ethnic group. The extent to which a district expresses older cultures in its physical forms, however, depends largely upon how long they have been settled there and how rich they have been. The Anglo-Americans, the proper Bostonians, were the first and have been the wealthiest; but the newest and least powerful immigrants, the Negroes and the ever-increasing hordes of students, live incongruously in houses, streets and neighborhoods originally designed and built for other kinds of people.

These considerations, and many others, would
have to be seriously weighed in any full-scale enquiry into the working of the EXMOE hypotheses in Boston Region. Two existing books would be highly relevant to such a study. J.P. Marquand re-enacted the life and decay of a sub-culture which lived in a complex of streets and buildings deliberately created by the founders of the group for themselves when they were dominant in the region as a whole. The biographical portrait of The Late George Apley\(^2\) is framed by the significant forms of Beacon Hill and the Back Bay. A novelist's raw material is man, hence Marquand concentrates attention on the weak-willed Apley, showing him to have been the man he was because his socio-physical environment "prevented him from being anything else", as he explicitly says in the first paragraph.

In revealing contrast to Marquand's work stands the ecological contribution of Walter Firey.\(^3\) The former used imaginative literary forms to present one man's life as a product of the environment. The latter employs the tools of academic enquiry to document the same sectional environment, among others in Boston, as a product of the psychological orientations
Observer's sketch-image of his pilot-study journeys in the western sector of Boston Region, drawn from memory five months after the last date of direct observation.

O.C. April '59
of various sub-groups in the community.

I now turn to analyse my conclusions concerning the strategic elements of metropolitan form which seem most likely to be vital to contemporary physical and psychological orientation at the regional scale. The pilot-study has not produced any startlingly new ideas on this subject, but has been useful because it has served to weed out many old ones. The ones that remain are consequently considered of real importance, and worthy of further investigation.

**Time, Age and Change.**

That an urban environment consists of modulated, diversified *spaces*, shaped for specific uses, we accept without bothering to mention. But it now seems to me that we must give the **time** element an equal importance.

Consciousness of time, or at least a subliminal awareness of it, seems to enter into metropolitan imagery in multitudinous ways. Distances are measured operationally, in travel-time, by almost everyone, it seems. The new contrasts with the old. **Value sometimes**
attaches to the newest thing, sometimes to the oldest, but strong feelings are usually involved. And no modern metropolis, unlike some small cities, has ever been built according to a single plan, or even in a single coherent period. Perhaps the organized application of modern technology is lacking on this front; but it may not be in the nature of a metropolis to be thus parochially confined to one single period. It seems that although a town or small city can be replanned and redeveloped comprehensively into a perceptible unity, using the techniques, styles, values, forms and resources of a short period of say, ten or twenty or thirty years, the metropolis cannot be. The rate of change today is so great that a technique, an idea, a form is obsolete before it can be comprehensively applied over the whole metropolis. Therefore a metropolis is a collection of courageous and not-so-courageous fits and starts of development, ever being abandoned, or simply smothered by the rush of growth and change. Sometimes a visionary park system (Boston, 19th century) a transit system (London, early 20th) a highway system (Boston, late 20th?) can be imposed upon a
metropolitan area, giving strong form that later generations find difficult to destroy, or even to ignore.

A high and continual rate of change is a dominant element in American mythology. Temporary chaos becomes accepted in many cases and places as the price of development and change, but sometimes it tends to become permanent. Lynch has noted the especially confusing role this high and continuous rate of change plays in the city image of Los Angelenos.

Bostonians, (denoting here residents of the region, not the city) are perhaps less hopeful that change brings progress. They are often torn or split by a conflict of loyalties between Past and Future. Although Texans and Minnesotans may tend to dismiss Boston as a dead remnant of old Europe, Bostonians are usually proud of their tradition; prestige and therefore imageability often attaches to the old rather than the new. The "sense of history" given to perception by venerable institutions, houses and monuments, can be a potent source of strong psychological orientation, and it is in Boston; but it functions best when a "sense of continuity" is also to be gained by the perception of new life harmoniously related to the
old. In Boston Region in recent decades, the sense of continuity has been well-nigh destroyed in the central areas, and vitality has been apparent only on the fringes, symbolized by the Route 128 and the North Shore Shopping Center. What I am trying to suggest is that old and new, age and youth, tradition and progress, griminess and shininess, renewal and decay, are strongly emotional concepts which are vividly apparent in the metropolitan environment, and which crop up in environmental imagery and affect both physical and psychological orientations according to the temperament and motivations of the perceiver.

Economic and other analysts have found that the concentric rings and sectors of metropolitan expansion are fit frameworks on which to hang ecological theories. Income, space per family, factory space per employee, road space per vehicle and many other indices, vary in concentric circles and sectors. Although these tendencies are revealed to perception in many other ways, they are generally correlated also with apparent age of building, and the settled look of landscaping, which are only
rarely distorted by either fake ageing or renovation. Metropolitan imageability can often effectively employ the perception of these gradients of age along metropolitan paths which cut across concentric circles or across the spines of old-established sectors. The age-gradient can be smooth and even, increasing steadily over many miles. It may be broken and uneven in parts, and depending on circumstances, this kind of articulation along a path can either be extremely confusing or highly memorable.

Driving east along the line of Mass. Ave. from Bedford, for example, one traverses violently new sub-divisions, but immediately on crossing Route 128, one is plunged into an old-established residential area -Lexington. One experiences also the shock of a sudden spatial transition, from the wide valley of the expressway to the tree-roofed and house-edged street, but the age contrast is striking. Thereafter, driving to the core, the age-gradient increases steadily. But if one turns perpendicular to this road almost anywhere in Lexington or Arlington, one immediately begins to traverse a reverse age-gradient, of increasing newness, whiteness and openness, until one emerges
into open country, past the lastest subdivision. One is then looking across one of the open wedges between the limbs of the metropolitan octopus.

These horizontal gradients of age and style are striking features of modern metropolitan physiognomy. It has probably not always been so. The ancient capital of Pekin, in a culture less devoted to innovation, slowly attained a planned overall form with what must have exhibited a homogeneity of apparent character and style, as well as apparent age. Nor did ancient mother-cities tend to expand indefinitely to the horizon. They tended to redevelop themselves continually on the same site, forming those layered mounds which now reveal their histories to enquiring diggers. If Boston, on the other hand, were to be abandoned tomorrow to the sweeping sands of time, future archaeologists would have to learn its history as does a forester with a tree.

Americans have been renowned for abandoning the mess they create in one place in order to push on into unspoilt land. Not only is this apparent in the growth of the country as a whole from the days of the frontier, but also in the metropolitan
suburbs and the metropolitan roads of more recent times. This reluctance to go back, clean up and redevelop has many serious consequences for imageability and orientation at the metropolitan level.

For example, as changing circumstances demand, a new type of road is laid across, beside, between, over or under, older ones. But nothing stays the same long enough for this particular type of road to be in fashion more than a few years, and so soon the very latest thing is built over, under, across or between the previous ones once more. Only rarely does anyone think it worth while to get rid of the old items which have been superseded. Many different kinds of streets, boulevards, quasi-expressways and freeways criss-cross and co-exist. Degeneration of form seems to hand in hand with the increasing percentage of land devoted to streets; this is most commonly to be seen in central metropolitan areas such as Cambridge and Somerville in Boston Region.

Much the same kind of situation seems to be occurring between the older suburban shopping centers and the new "motorized" centers. The new form is designed to supersede the old; a new functional pattern
is laid down just a few miles outside the existing built-up area. The older shopping and civic center must then co-exist and compete with the new; its site is not comprehensively redeveloped to satisfy new demands, although palliatives may be applied to it in the form of indiscriminate parking lots, but these only hasten the degeneration of the form it may once have had as a ribbon street.

This kind of horizontal escapism, continued over long periods of time, tends to destroy coherence in metropolitan functions and in metropolitan form, decreasing imageability as entropy increases. The political and economic anarchy which causes so much of the trouble is amply expressed and symbolized in the resulting incoherence of form.

Notwithstanding the very serious problem which uncoordinated development poses today, it would be foolish to forget that it is anything more than a particular passing phase of metropolitan evolution. Already we can see signs that urban renewal may reshape the gradient of increasing age by starting a process of renewal outward from the metropolitan core. After long delay, the abandoned
railway yards of central Boston are being replaced by the Prudential Center. The Scollay Square district, which once had other important functional roles in the core's land-use pattern, is similarly being replaced by the Government Center. It is possible that this process will eventually reach out through the obsolete and decaying areas of Cambridge and Arlington.

In conclusion, then, it can be briefly said that metropolitan imagery depends heavily on the direct perception of orderly sequences of growth and change over time, as well as through space. For optimum imageability, these evolutionary sequences should lead from a fully developed and coherent form, significant of one period, to another fully expressed and complete form significant of another, later period. The Back Bay and Beacon Hill were such fully achieved forms significant of a particular period. Six Moon Hill or a Techbilt neighborhood would serve as examples of the fully developed urban patterns of another age's view of what a residential area should be like. Perhaps the new West End project will prove another. Some of these
fully achieved forms will have sufficient permanent or universal significance that they will be worth preserving indefinitely; others, perhaps the old ribbon shopping street is one of these, will not. If the latter are left to rot, instead of being replaced, their gradual degeneration of form and function creates tremendous problems for both physical and psychological orientation. The sequences of timing and spacing these developments and redevelopments gives rise to gradients of style and age which can help to link and mesh their separate images into continuous patterns.

Metropolitan Paths and Channels

Highway construction in the U.S. has by now achieved a status as one of the most astounding, deliberate, efforts to reshape environment that the world has ever seen. A nation-wide articulation of the landscape, it can be compared to the fencing and hedging of common lands in England at the dawn of industrialism. A governmental enterprise, it resembles the military highway network.
of the Roman Empire. Supported, even demanded by a mass faith, it is comparable with the Gothic era of cathedral building. Much has already been written about the almost mystical import of automobiles and "mobility" in American life. It is commonplace now for people to suggest that the future will hold something like that of which Frank Lloyd Wright wrote in 1932: "a new way of life based on the great horizontal line of freedom from ocean to ocean".4

In the meantime, at least, efforts are being made to integrate the freeway systems with the old-fashioned metropolitan masses. For all practical purposes, the cost of this work is no object, and highway authorities suffer from no lack of power and influence in implementing their plans. Indeed, they are far and away the most powerful, and in many cases, the only public authorities seriously reshaping environment at the metropolitan scale.

It is not surprising, therefore, that we cannot begin to think about, sketch or talk about U.S. metropolitan regions today without giving a special emphasis to the expressways already built or under construction. In large measure, this is natural, as
it should be, and necessary for high imageability and good orientation at the metropolitan scale.

Unfortunately, however, the expressways are so highly developed that they tend to dominate other aspects of the metropolitan form. They dominate imagery because of their incomparable scale, the "fully-realized" perfection of their design, because of their continuity across a region, as well as because one is normally happy to be able to use them as much as one can for cross-metropolitan journeys.

A glance at the "Sketch Image" drawn from memory five months after the pilot study observations were completed, shows how dominant are the Central Artery, the Mystic River Bridge, Route 128, the Massachusetts Turnpike and Route 3.

The historical and functional relationships between Route 2 and Mass Ave, the cross-sectional routes selected for the pilot-study, have been explained in Chapter V. Route 2 is a semi-expressway, a bypass or relief highway serving the western sector which had originally depended entirely on Mass. Ave. Mass. Ave was superseded, but has not been reshaped; Route 2 may, in the future, be brought
up to full expressway standards, to take its place as one of the major radials of the planned highway network. Its present line runs through a wedge of open land previously left undeveloped. This is the kind of location planned for each of the other major expressway radials in Boston Region, which are expected to run from the inner loop around the metropolitan core to the outer fringe circumferential Route 128.

General considerations of functional efficiency, economy and amenity, make this kind of line for a radial expressway an excellent one. But as I have pointed out in some length in Chapter IV, it does isolate the motorist from the metropolitan districts between which he is passing and he suffers a loss in perceptual communication in consequence. He is put to further disadvantage, however, from the point of view of imageability. He may have a perfect image of the simple grand design of the regional expressway system - two concentric circles and 6 or 7 radials - but if he sees nothing but trees and embankments all the time while actually on those expressways, he would be unable to mesh his image of the circulation channels with the
with the districts and cores among which they run. Physical orientation would thus suffer as well as psychological orientation.

Something good, therefore, can be said for an occasional stretch of elevated expressway, a high bridge yielding a good view, or a highway along a ridge. Other design adjustments can be made for occasional short and long views from and towards the motorist on the regional expressway. These kinds of views are perhaps more vital for the radial expressways than for an outer circumferential like Route 128, which is easily conceptualized as circling the metropolitan fringe. (This problem is discussed more fully in Appendix A). Of prime importance are views of clusters of high buildings, which mark the metropolitan core, or of that single tall building, mast or spire, which marks a district, or sub-regional core.

It seems very necessary that the major highway network over an entire metropolitan region should be of a simple and clear nature like that of the pattern proposed in Boston Region. Once established, the lines of this pattern should be preserved,
and the expressways along them widened rather than superseded by other roads set on a conflicting pattern. If, however, the spread of activities more evenly throughout metropolitan regions demands a more diffuse system of traffic flows, more evenly spread, less concentrated along a few lines, then any further multiplication of the flow lines should bear an easily discernible relationship to the dominant pattern of first-class roads. Some kind of hierarchial system seems absolutely necessary, notwithstanding whether the pattern is a grid giving an even distribution of accessibility or a radial system giving a concentration at a core. Many variations of design technique are possible but the supreme necessity of orientation is that users of the system be able to perceive it as a designed system, not as inconsistent or fortuitous.

The Constellation of Centers.

In Chapter IV I tried to show that the variety of specialized activities which traditionally takes place in a metropolitan center is the intrinsic
functional purpose in the service of which all the complexity of a metropolitan region is called into being. If one agrees that the accessibility to a wide diversity of specialized activities will be completely evenly spread over a metropolitan region, then we may assume that centers and sub-centers will continue to exist, even if not in quite the manner to which we are accustomed.

From the viewpoint of imageability, a metropolitan core may be operationally defined as that small area which evokes the highest image density among the total metropolitan population. Those parts of the region which evoke the strongest and most widely shared images among the population do act as powerful agents of social cohesion. Sometimes a lake, a harbor or a mountain so dominates the natural topography, as in Montreal, San Francisco, Sydney or Geneva, that it can also help to serve this function.

Very few, if any, metropolitan citizens can be said to participate equally in all parts of the metropolitan environment. They will generally be more intimately involved in one sector than others.
But they will tend to meet and mingle on common ground in metropolitan cores and sub-centers. These pieces of common ground, wherever or whatever they are, are not only functional but also expressive and symbolic elements of cooperative endeavor. If the functioning of a metropolis is to be realistically comprehended, these constellations of centers must be given a high degree of visibility. If cooperation and social cohesion are to flourish, then these elements must continue to concentrate within themselves the full range of cultural symbols and culture-building activity.

Both these criteria are under attack today in the U.S. metropolitan regions. New types of centers are evolving to fit into new types of functional arrangements. A typical example of these is the North Shore Shopping Center on Route 128 in Boston Region. This "motorized" Shopping Center is highly imageable, having a strong identity of form, a highly visible place on the structure of the regional highway system. It transmits a simple message highly effectively from
the moment one first sees it on the horizon from Route 128 (see photo-sequence). Not only is it so designed as to make an approach to it as direct and simple as possible, but it is an example of a highly stylised form now known all over the country and so is recognizable as a conventional signal.

But it does not fully resolve the problems of symbolic communication. It is so splendidly sited, so exciting and impressive to approach, so grand in its monumentality, that one should be excused for imagining that here was a great palace, a Cathedral, or at least a great governmental, civic, community and cultural complex. But it is all these things and yet none of them. As one approaches the central mall, the truth is ingenuously revealed to direct perception: high above an avenue of U.S. national flags flies another flag bearing blue marks on a white ground, "Filene's, we love you."

Such centers are the true contemporary temples - the God is retailing; his benediction, the distribution of consumer goods. Any other activity within the temple except obeisance to
this God is tolerated only as it supports and enhances the rate of offerings. Eating, sitting, and the segregation of children is therefore provided for.

This novel religion is certainly a more democratic and beneficent one than many the world has seen. And the temples housing it are designed as finely and as humanely as one has a right to expect.

The old-style town center served a diversity of interdependent functional and symbolic purposes within the framework of a single form. The new style "regional shopping center" has split this complex organic unity asunder, removing some of its functional and symbolic purposes to a new home, abandoning the others as if they had no intrinsic importance, and as if their traditional unity was of no value.

Where, for example, are the recreational, entertainment, and social facilities of the old centers? where the meeting places, large and small? institutionalized and spontaneous? where the churches, the clubs, pubs and cafes? where the political and administrative services, the govern-
mental symbols? where the balance between shops and offices, the large and small business, motivations of profit and service, the special interests of men and those of women?

This split complicates the problem of imagery at the metropolitan scale. What was previously a simple matter of hierarchial order from metropolitan core to corner store, is tending to become a patternless diversity of competing attractions.

It may be that the expanding scale of metropolitan regions and metropolitan life does demand a greater specialization of functions and symbols in a system or constellation of centers and sub-centers. Problems of accessibility being dominant, no single star in this constellation may be as dominant as was the old-style metropolitan core. But some kind of order, pattern and logic must be discernible in the constellation – more akin to the logic of a solar system than to the flat and fortuitous direct view we get of the Milky Way. New forms of linear organization may, however, prove to be both more imageable and more functional at the metropolitan scale. Already "roadtown" flourishes like a
poisonous weed over the landscape. But it may be that some higher mutations of roadtown can be evolved. Route 128 may prove to be a prototype, for it seems likely that if present trends continue, people will commonly think of it and speak of it as the "Main Street" of the Boston region. By then, of course, it would be as congested as any old-style "Main Street" but would be as highly imageable and as charged with meaning. All it perhaps needs is a few more factories, a few more offices, a few more shopping centers, some recreation facilities, hotels and clubs, and it will be as diversified as a city core yet united by a broad landscaped expressway running twenty miles or more down the middle. This could provide a powerful image satisfying the need for shared physical and psychological orientation over a wide region.

I myself lean more towards the constellation or poly-nucleated pattern of metropolitan core and sub-centers, because I feel it is intrinsically a more highly developed and significant form. It would require a higher degree of coordinated design and conscious social control.
The linear pattern also is capable of a high degree of articulation at the metropolitan scale. My quarrel with it is not on the ground of image-ability at that scale but on my feeling that it has functional and symbolic deficiencies on a more intimate pedestrian scale.

**Topography and Panoramic Views**

Rivers, ridges, valleys and bays, of certain optimum shapes and sizes, can be most potent elements of a metropolitan image, if their forms are exploited and intensified by the patterns of man-made environment around them.

High places provide opportunities for those synoptic views in the concrete, which Geddes thought so important for any real comprehension of the large-scale significances of urban form. An excellent example is the easily accessible and grandly designed Piazzetta Michelangelo on a Florentine hillside. The powerful, simple forms of the Cathedral and the Palazzo Signoria are seen dominating the lower roofs of the city, through which runs a river.
A religious and secular power both compete and combine for leadership over a river-valley city. Today, we cannot symbolise the complex structure of society so simply and the scale of our metropolitan regions does not allow one or two buildings to dominate the view.

The John Hancock Insurance building is the tallest and most dominant single structure in an image of metropolitan Boston. But even from the middle range of suburbs it is a mere speck on the horizon, when it can be seen at all. A highly imageable metropolis would make use of whatever excuses could be found to strengthen the functional pattern and its symbolic content by the clustering of tall buildings on hills, for example, to emphasize natural topography, or in sub-regional centers to mark them from afar. Panoramic suburban views in modern metropolitan areas reveal either nothing except tree tops or else a formless hodge-podge of low structures. The white ribbons of highways

+It seems that it would be a relatively simple thing to fly captive balloons or blimps to mark important sub-regional centers which yet lack high buildings.
sometimes stand out, but if the central metropolitan core cannot be seen, then water-towers and and television masts are usually the only distinguishable vertical features. These can be useful to imageability if they can be related to highways, subcenters or natural topography, and if one water-tower on one hill, or one set of masts, can be told from others. Perhaps we must turn to aerial views in order to experience a synoptic view of a modern metropolis comparable with that of Piazzetta Michelangelo. Air travel is now common enough to be taken into a consideration of popular imagery at the metropolitan scale.

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In conclusion, then, I believe that the items listed under the four headings (Time, Channels, Cores, Panoramas) are the most important elements which justify further research at the metropolitan scale of imageability.

I have not specifically referred to Lynch's major category of "districts" because I feel it to be
a relatively simple concept which everyone uses quite naturally, it is true, but which planners have tended to over-emphasize because of its simplicity, and which the perceptual aspects of which were adequately analysed by Lynch. If it is to be subsumed under one of my headings it would be covered by the first, where it is given the emphasis which I feel to be particularly relevant at the metropolitan scale.

This difference of emphasis between what is most relevant at each scale of environmental imagery is again revealed in my treatment of panoramic views. While one is experiencing a compact city, or a metropolitan center, moving at relatively slow speeds back and forth within a limited and intensely stimulating area, landmarks and distant panoramic views are of slight importance. Although they are not presently exploited to any high degree in our metropolitan regions, I believe they are highly desirable and effective elements in a metropolitan image.
Let us explore the Boston region through the eyes and mind of a comparative stranger who is yet familiar with the cultural patterns of the northern United States.

We will assume that such a stranger has lived for almost a year in the western sector of the metropolitan region and that his workplace lies somewhere along the same radial cross-section. In consequence of this arrangement, he has made many trips to and fro in the area, exploring alternative routes in order to weigh their relative shortness, speed, safety and pleasantness. But because he is reasonably observant, he has received many other messages that come to him, silently and unsolicited, from the physical environment.

He has come to know a little of the other parts of the metropolis from other journeys, taken in pursuit of recreation and sightseeing. During the summer he often travelled to the South Shore and Cape Cod and as often also to Marblehead and the North Shore. In
addition, social occasions have taken him into some suburbs that he would not otherwise have seen. He has used his private automobile on almost all his journeys, for the infrequent and often non-existent public transport service gives him little choice.

This would describe the situation of many new middle-class residents of the Boston region. If the extent and frequency of these trips were plotted on a map, one would see a "pattern of metropolitan participation" which would be typical of many middle class people. Some would be transients, their moves determined by their jobs. Others would be gradually exploring the region, looking for a place in which to settle permanently. All would be seeking, whether consciously or not, to comprehend the shape and character of those parts of the metropolis that directly concern their lives.

Let us try to describe the experiences of driving upon two of the main roads in the western sector of Boston as they may ordinarily impress themselves upon such a new resident.

To communicate even this fragment of the continuing and wide-ranging metropolitan experience is
indeed difficult. Mere words are constantly cracking and breaking under the strain. Photographs can help a little, but at best they are momentary, blinkered and space-less.

The beginning and end-points of the journeys we choose to describe are quite arbitrary, for traffic joins and leaves the mainstream at many points. As the older, centralized metropolis evolves into an urban region that is either poly-nucleated or simply not-nucleated, the straightforward radial journey becomes less common. But even the older metropolis was not to be experienced as a dictated sequence, as is a musical symphony or a stage play.

Adding to our difficulties is the fact that the sensation of moving in one direction along an urban road is likely to be of a significantly different character to that of the reverse movement. We will try to note these differences wherever they may be highly marked.

The weather, the season and the time of day all condition the experience, yet the observations offered
here apply, for the most part, only to sunny afternoons in fall.

With all these limitations and qualifications in mind, we are now ready to proceed.

The routes described below lead from the satellite towns or ex-urbs of Bedford and Concord respectively, over a distance of about 20 miles, to the Massachusetts Institute of Technology on the western perimeter of the Boston metropolitan core. The old Massachusetts Avenue is one of these routes. Along "Mass Ave" and its extensions grew and still grow the suburban centers of Bedford, Lexington, Arlington and Cambridge. This is as striking an example of ribbon development as will be found anywhere in the world.

The other roadway described below is known as Route 2, the Concord-Cambridge highway. This road seems a relatively recent attempt to provide fittingly for the automobile and to relieve the burden of through-traffic on Mass. Ave. It bypasses the regional sub-centers. A glance at the map seems to show that it was located according to the line of least resistance, of least disturbance to property. It runs through a wedge of undeveloped land, between the fingers of the
built-up suburbs. It skirts the edges of two large ponds, cuts quickly through a residential area and finally runs along a riverside embankment to the metropolitan core.

Let our observer begin somewhere in the vicinity of Concord, on the Route 2 bypass south of the township.

The topography is heavily wooded and irregular, but he enjoys long sight lines and easy driving along the shallow channel cut through the trees by the four-lane roadway.

There is soon an ordinary crossroad, where a black-on-white sign indicates a right turn to Walden Pond. This name evokes thoughts of Thoreau, and our observer recalls his own happy hours spent swimming in that pond. He cannot, however, refresh his memories of the place by any view from the main road. It must be foregone if his destination lies eastward and by the shortest route.

A mile further and he arrives at a four-way intersection at grade, fringed by a few straggling Concord houses. Here he must quickly decipher the
sign-boards and decide which way to turn. He has come to the end of the bypass, he can now rejoin the direct line of the road as it comes from Concord center. Most of the traffic wants to do this and the movement is made easy by a wide curve to the right, appropriately channeled. From this point, he leaves behind the political jurisdiction of Concord. A conventional notice board announces the boundary of the Town of Lincoln. Combined with the decision-forcing intersection, the notices announcing Lincoln and pointing the way to Boston make a stronger impression than they would if isolated along a featureless roadway.

A mile passes. A cluster of houses, a set of traffic lights and a multitude of little signs indicate the turn-off to Lincoln center. Two more miles go by, across a swampy patch, through some gentle hills and down to a crossing over water. Our observer knows from his map that this is the "Cambridge Reservoir", and he wonders how the water in it gets to Cambridge, and perhaps dares to ask himself why it belongs to that distant suburb and not to any other. But speculations such as these are not to be satisfied simply by passing the site.
Once across the narrow neck of the Reservoir, and being a little familiar with the road, he would know that the interchange with Route 128 is not far off. But before he comes to that, what are his general impressions of these past three miles?

Very little of the land he has seen appears to be in any agricultural use. Most of it seems to have reverted to bush and forest, if it ever was, in fact, anything else. He might sense that he is on the fringe of a big population center in several ways, but he cannot be sure, except for the signs that say "Boston 20 miles". There are the houses that cluster at crossroads and the odd ones in between: hardly any of these dwellings look truly "rural". Some are ludicrous suburban villas, none the more attractive for their unaccustomed isolation. He can only guess at what kind of people live in them and why.

There are a number of roadside produce stalls. These are typically to be seen along general-duty country roads used by city folks at weekends, or so our observer believes. They are certainly the most eye-catching feature of this stretch of Route 2 outside Route 128. It is interesting to reflect that none
are to be found inside that circumference, at least along Route 2.

A stall announces itself to oncoming traffic through crude signs at the roadside, often several hundred feet in front of it. Our observer wonders if that naive lettering deliberately insinuates rustic simplicity and easy bargaining. Where do the apples and tomatoes come from when, as is often the case, there are no orchards or hothouses to be seen? The stalls may not all be true farmers' outlets, he feels, but even as mere shops they make a refreshing change to super-market fluorescence.

Notwithstanding the signs of human activity represented by the houses and stalls, these three miles allow regular travellers a clear view of the changing seasons ... white ground and grey gaunt tree skeletons in winter, evolving greens through spring and summer, giving way in autumn to spectacular foliage and heaps of orange pumpkins on every roadside stall.

Otherwise there is little pleasure to be had from moving at a steady 45 m.p.h. along the straight stretches of this road between Walden Pond and the Cambridge Reservoir. The low trees on both sides
restrict the view. The landscape is neither wild nor coherently humanised. Both kinesthetically and visually, it is a dull experience.

Passing the Reservoir, our observer drives for some seconds along a straight and low-lying channel enclosed on both sides by trees and rising ground. The roadside is not fenced or curbed. On a pleasant day there are cars parked along the verges. But ahead, the field of view begins to open out as he first notices a simple concrete bridge spanning the road, grassily embanked on both sides. Above and beyond the bridge are tree-crowned ridges that lead him to anticipate a continuation of the non-urban landscape.

As he approaches within a hundred yards of the bridge, the field of vision widens almost to 180 degrees, but the high embankment and bridge rush forward. The slip roads of a modified clover-leaf interchange rise away on both sides. White-on-green signs, used only on the State expressway system, announce that Route 128 can from here take one north or south. This time, he ignores them, and steers straight as the underpass wall and roof slip past.

He knows from experience and from maps that
Route 128 runs circumferentially around the metropolis, and so he is well oriented at this point. He is at an important regional junction. He is entering an important western gateway to the metropolis. He is crossing from the ex-urbs into the sub-urbs. But there is no perceptible expression of these ideas at the Route 128/2 interchange.

It would not be out of place at this point to record the images of Route 128 that spring to the mind of our observer. A feeling that the interchange just passed was undistinguished in shape and setting provokes a memory of that most spectacular and complex interchange to the south-west, where the Massachusetts Turnpike and Route 30 join Route 128. The three roads there linked are each of very different design standards and character. This is truly the major western gateway to the Boston region, for it provides the most direct access to and from New York. Its unmistakable design and unique function combines with an unusual and pleasant setting - a lake with ducks, a park and an old boathouse - to form a vivid and memorable image.

But there tends to be little distinction between most of the other interchanges. They are gradually being
brought to a regular conformity with current traffic engineering standards of perfection. They are numbered and signposted. Navigation by a continual study of numbers, signs and maps is necessary until, after some experience, the subtle differences between the surroundings of one and another can be recognised.

On Route 2 at 128, it is also difficult to differentiate the eastern from the western approach. This, however, is not a serious deficiency, for one is rarely unaware of which side one is on.

Speeding eastward, up and away from Route 128 along Route 2, our observer now receives two rather conflicting messages. A median strip, 10' width of asphalt, suddenly appears in the roadway, seeming to say that traffic will be heavier from now on; the traffic lights stand on the crest ahead, probably holding up a line of autos and trucks. Are the first real suburbs now to appear?

But over on the left serenely stands a cluster of vintage farm buildings, framed by trees on undulating land behind a low and very old fieldstone wall. The median strip peters out before the lights are reached at the crest. Is the suburban fringe, then,
still far off?

This sort of indecision continues for what seems a long time - but is shown by a map to be merely two miles. For the most part, there is no sign of human habitation, but occasionally, pleasant residential groupings can be glimpsed, tantalizing, through foliage.+

The traffic lights on the first crest inside Route 128 take away from the sense of regional significance and scale that Route 2 would have as an expressway proper. To stop at these lights, brings our observer "down to earth", forces him for a minute into close contact with the overhanging foliage and its shadows, the grass verges and their stones. There are three such minor intersections in a two mile stretch from here on. The side roads lead off north and south

+This phenomenon is noteworthy, for it is likely to become more common along Route 2, and along many other urban expressways that are planned to run between, rather than through, residential neighborhoods. Route 2 is relatively new and is of relatively limited access. Developers have, for some reason or other, not yet subdivided and sold all the land in the previously untouched wedge between the built-up "fingers" of Lexington and Waltham. Route 2 now serves this wedge, but only at selected points, and land on either side of it will one day be taken into a much wider and more modern highway. Meanwhile, whatever houses are being built along it are all set back, often behind trees.
and eventually arrive at various suburban centers - Lexington, Waltham, Belmont - but one cannot see or sense these centers from Route 2 except by reading the signboards.

Speeding away from the first of these intersections, our observer heads down a slope that finally curves upward out of sight among heavy masses of low trees. His view is opened to the right momentarily, but no man-made object can be seen unless he should look closely at right angles to the road, where stand several white houses in a clearing. He looks that way now making an effort to see the nearest of these houses, for he remembers it as a special landmark of the westward journey away from Boston.

Sweeping around the gentle curve in the hollow and commencing to rise again, he experiences a strong sense of exhilaration in movement. Mounting to a crest, the horizon, there is revealed an even longer and straighter rise, to yet another horizon. The trees press close, holding his eyes within the channel cut by the road. The total distance of this uphill stretch is scarcely less than a mile.

He hardly realises that the final crest is
also an overpass to a minor road. A sign, a balustrade, a few gables amid foliage and he is over it.

The long and deceptive rise to the overpass crest was remarkable for its kinesthetic quality—the sensations of bodily movement. Travelling in a reverse or westward direction, the kinesthetic effect is sometimes complemented by other phenomenon.

One of the white houses previously noted stands squarely in line with the long descent until the road curves away in the hollow. The morning sun falls on the white house front, turning it into a brilliantly visible landmark, etched into the dull tones of tree and field. It remains visible over the length of a mile—480 seconds at 45 m.p.h. But it is only a landmark on sunny snowless days, and then only until mid-day. It is only of high visibility from one direction of travel. For all these reasons, it is therefore neither highly memorable nor reliable as an aid to orientation.

Continuing eastward from the overpass crest, our observer begins a gradual descent along a vaguely curving road, through a scrubby forest. For the next two miles there is little of interest in the
road itself. A couple of minor intersections, a nondescript gas station - the first of the trip - a white horizontal "ranch" house opposite a truck farmer's hothouse ... true expressions of the rural-urban fringe. Then, along a low-lying patch of land, there is a sign calling attention to the "Highland" homes, seen standing in stark and treeless respectability nearby.

A little further on and the main body of suburbia appears. For the first time the entire visual field is filled with economical houses on a small plots. There are few trees, but lots of grotesque, leaning poles, three times higher than the houses. Political billboards stand by the road-side.

In the distance, straight ahead, there is a high ridge, dotted with house-tops and trees, surmounted by a concrete dome structure, pantheon-like. This ridge and its monumental topping was first seen by our observer two miles back. It has reappeared several times to him as the road curved. What is that dome? A war memorial? An observatory? Or perhaps only a water tower?
He advances along a disciplined avenue of poplars, the first formal landscaping of the route ... a further sign that he is closer than ever to a wholly man-made environment. Then two "motorized" churches flit by, odd conventionalized building-types, floating in their parking lots.

The road has been rising steadily for some time. Quite dramatically, our observer feels that he now reaches the high spot of his journey, literally and figuratively. A paved median strip appears again, this time to stay, as he can see by looking down the long curving descent that stretches ahead. The road widens by the addition of "breakdown" lanes on either side. The posted speed limit drops from 45 m.p.h. to 35, but the long hill, the extra width and the median strip tempt him and other drivers to go faster rather than slower. He notices 'buses for the first time, and senses, perhaps also for the first time, that he is entirely part of a pressing stream of traffic. The speed satisfies him, especially when he looks over and sees the huge trailer-trucks crawling up the hill in the opposite direction.

All these things he instinctively assimilates
without conscious thought as he meets a new driving situation. Of immediate impact upon his conscious mind is the broad panorama of central Boston that he now enjoys for the length of a mile.

The panorama sweeps from left to right as the hill curves down. His view at any point is closed on each side by trees and the middle-aged houses that are jumbled along the embanked roadsides. From the crest, he first sees the twin peaks of the Mystic River Bridge, faint on the far horizon. Further down, this gives way to the pencil silhouette of the Customs House tower. Finally, towards the bottom of the hill, he can discern the characteristic outline of the John Hancock building, dominating the skyline on the right hand side.

A survey map shows this high point of Route 2 to be about 325' above sea-level and about six and a half miles as the crow flies from the Hancock building, the top of which is itself about 500' above both street and sea level. The ridge that Route 2 crosses here is the same one that carries the puzzling dome that was seen earlier, and which a good map would show as the Arlington Heights water-tower. There is
a large park, a little way below the tower from which the wide panorama glimpsed fleetingly from the main road can be viewed at leisure. Even so, however, it reveals little coherent form in the inner western suburbs that it covers.

At the bottom of the hill, Route 2 passes under Route 60. A signboard at the constricted interchange announces the turn-off to Arlington, Belmont and Waltham.

The panorama disappears as Route 2 slips under Route 60 and skirts Spy Pond, a quiet body of water fringed by willow trees. Through these trees, our observer notes a white church spire above the foliage massed around the other side of the Pond. Experience informs him that this spire belongs to the church which dominates the road junction in the Arlington center.

Leaving Spy Pond behind, Route 2 runs straight across a desolate area of low land. A writhing, contorted neon sign on the right screams "Quickie Car Wash" and later a more sedate painted board says "Industrial Research Consultants". A large sign stands in the vacant land to the left, announcing a new shopping center to be built there. The sign
is fading with age.

Driving in the opposite direction across this area, there is a clear view of the long Arlington Heights ridge, house-tops and trees jumbled over it and the classical water-tower on the skyline.

Looking eastward once more, the scene continues desolate. Lost in a formless open space, our observer is glad to be in his car; without it he would be physically and psychologically helpless. He looks again to the right, sees a thin smearing of petroleum tanks and long low sheds roofed with the words "Bethlehem Steel". He brings his eyes back to the roadway, and they are attracted slightly to the left by two curious shapes standing out against the sky. One is a globular metal water tank on spindly legs. The other is a large, barn-like structure with strong, simply outlined forms. He has never discovered what this building is, and it continues to puzzle him.

He dismisses this problem quickly, however, and concentrates on the road ahead. It is rising, and soon the traffic streams diverge. He is approaching a rotary intersection.
Route 2 has so far been an easy road on which to drive. Its shape and surroundings have been modelled on a broad and simple scale without profligate elaboration of detail. That phase is now over. The next two miles are confusing, a nightmarish splather of shapes and landuses set along a winding, ill-defined road. There are ice-cream, doughnut and hamburger showrooms, mixed up with nondescript industries - in a word, "roadtown". There are five rotaries to be negotiated.

Our observer finds it difficult to build in his mind any coherent sequence of images of this section. He must always navigate from signpost to signpost. A few sights remain in his memory, but their sequence is unclear even after several dozen trips.

He enjoys a short but stimulating spatial experience, crossing railroad tracks through a bridge of high steel trusses ... pure constructivism. He does not realise that the bridge takes him over the main line of the Boston and Maine Railroad, a major inter-regional link. As he crosses it, the high screen of a drive-in cinema rears up on his right hand side.
He passes by another pond – Fresh Pond in North Cambridge, as he knows it to be from the map. Then Route 2 dives through a tree-lined street in an old residential area. The houses here are of two and three stories, seem comfortable, secure and well-maintained, despite their apparent average age of, say, at least 30 years. The textures of this area have a richness that presumably tends to come with age. The grain of building is coarser than he has previously seen on the journey, for the individual houses are larger, the plots smaller in relation, and apartment blocks appear for the first time. The densities of plot ratio, of human activity seen, and of traffic, are all higher than any encountered previously. All these qualities give our observer the sense of being in an urban area, of being in what he has learnt to call an inner metropolitan suburb.

The scale of environmental relationships now begins to increase. A multi-storied hospital stands beside a stretch of the route that is being reconstructed and widened. A confusing conjunction of three rotaries precede his emergence into the broad space of the Charles River and its open banks.
The traffic stream has become a torrent as it twists and turns. Many possible alternative routes seem to be available but our observer fears to venture from the posted main track. He anxiously searches for the small white circles marked with the figure 2.

Arriving at the Charles, he has the choice of two paths leading to the metropolitan core. He has learnt that the quickest and safest is the expressway on the right bank, although a slower-speed road, provides more dramatic views of the core and is in more intimate touch with the river, with Harvard, with M.I.T. and other activities that interest him. The expressway, on the other hand, is of far greater kinesthetic stimulus. One speeds on it through underpasses and through open-cut channels walled with grey concrete. One enjoys it as a private experience, out of contact with the world. But to get onto it, one must make the special effort of negotiating an extra rotary and crossing the river. The signposts saying "Boston" and "Route 2" point left and so our observer follows them onto Memorial Drive.

He takes pleasure in being close to the water's edge, notices a pair of lovers dawdling on the bank and
then is engulfed in a tunnel of trees. Between their trunks on the left flash the familiar yellow and orange of the Boston streetcars. He is passing their depot. He stops at traffic lights, a bridge on his right. The mock Georgian of the Harvard Houses begins at this point.

He is now closer to Harvard Square, a bustling business center, than he has been to any similar focus of activity on his Route 2 journey so far. He can sense the closeness of the Square and indeed see it if he looks down Boylston Street.

Memorial Drive continues to have a picturesque and a sentimental appeal to him until the last vestige of the College falls away on his left. The Harvard "presence" here is strong. Our observer's reaction to it tends to vary with his attitudes to Harvard as an institution rather than to it simply as part of the landscape. But he nevertheless always marks and enjoys the image of a graceful three-arched footbridge that spans the Charles from a wide grassy bank beside Memorial Drive to the anonymous mass of the Harvard Business School. He looks across to another footbridge, spanning the expressway on the
opposite bank. It is of suprisingly akward design, in contrast to its older and more gentle partner. The two together leave a strong but unpleasant impression in his mind.

Three black factory chimneys float above some trees ahead. Several more roadbridges come in from the right at light-controlled intersections. "Roadtown" almost takes over the Drive, as gas stations, restaurants and a supermarket slip past on the left. Over the far bank hovers a cluster of floodlight towers, a sporting stadium of some kind.

An opportunity to pass over an intersection presents itself. Our observer takes it, accelerating into the double curve - up and to the left. His tyres hum on mesh-metal pavement. From the crest he begins to see a panorama of central Boston, which continues for the next mile as he progresses steadily towards it.

A long, low bridge across the river basin slowly comes abreast of the observer; it swings around his field of view, growing taller and less long as the perspective changes. Over it floats the John Hancock building, highest structure in the Boston
region, which must surely mark the heart of the metropolis. He has plenty of time to observe and relate these things — and plenty of time to decide whether to turn right at the approaching crossing or not.

As this first bridge leading to the center is passed, a second appears half a mile ahead. It is unmistakably different in design to the first, and well-named the "salt and pepper-pot" bridge on account of its central pylons. The view of central Boston is now condensed, framed between two bridges, and clearly set off between water and sky.

A serrated skyline hovers above textures of lesser buildings, and a gold dome shines in the center of it all. The river's edge is lacy with expressway, park and music shell, and the broad smooth space of water is sprinkled with sailboats.

The first time he beheld this scene, on his first day in the Boston region, our observer felt it neither spectacular nor beautiful, but rather mildly pleasing. It made orientation, both physical and psychological, easier for him thus to be able to see the central city before entering it. The most surprising thing to him then was the distressingly incomprehensible
John Hancock building, out-of-scale, isolated, forbidding. Familiarity with Hancock bred a friendly lack of fear and awe. But further acquaintance with other, more subdued landmarks encompassed by the scene made him appreciate its wider significance for a great number of more senior residents.

Now the view has become, for him, as for others, a pictorial symbol of Boston as city. Just as the towers of Manhattan, viewed from New York Harbor, have become a most potent symbol of that city, so this view across the Charles stands for Boston. It does exactly this on the cover of the 1958 Boston-region telephone directory; and it looms large in conversations that turn on the attractions of Boston.

A city is more than just a collection of buildings, but also a collection of states of mind, of dreams and of aspirations. Boston, like all cities, evokes states of mind that adhere to particular buildings and groups of buildings. The most memory-laden forms that the city possesses are combined in the Charles-side view of the golden dome of the State House shing above the jumbled roofs climbing Beacon Hill, flanked by the bulkier, more disciplined
bourgeois houses of the Back Bay. The Customs House and Hancock towers partake somewhat of this significance, perhaps because their respectable historic antecedents induce one to forgive and even admire their slightly comical but unmistakable profiles.

These forms, taken together, symbolize the essence of Boston as a city of dreams. To the extent that the dreams are of a glorious past rather than of a present or future, the most visually striking elements in the picture are not necessarily those most commonly noted or even, indeed, noticed. The stark-white, vertically accented mass of the courthouse block and a number of equally anonymous office buildings dominate the pattern and skyline of photographs taken from Memorial Drive. Yet they do not register strongly even on the conscious mind of our direct observer. Instead, the indistinct, blurred outlines of Beacon Hill, Back Bay, the State House and perhaps one or two churches, are those most remarked.

Another explanation is, however, possible. Beacon Hill, the Back Bay and the State House exhibit distinctive forms to the observer who moves among and between them at close range, at ground level.
Having enjoyed this intimate acquaintance with them, one may be naturally anxious to discover them in a distant view, whatever the difficulty.

This still does not explain our observer's lack of recognition of the Courthouse as compared to the Hancock building. Both are difficult to see at close quarters, being hidden above narrow street canyons, but our observer has had equal familiarity with the Scollay Square district and with the Copley Square vicinity, in which the two buildings respectively stand.

The Hancock building, however, has a more solitary position on the skyline, and it advertizes itself with flashing lights by night. Approached from the west along Route 2, it is the nearest tall building, and so bulks largest in perspective.

But insurance companies such as John Hancock are also of greater socio-cultural impact than local government or local courts seem to be. If it is true that Boston is famous for emotion-charged history, for its concentration of finance and insurance corporations, but not for its local justice and local government, what could be more natural than that this imbalance should be reflected in our observer's apprehension of
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the cityscape?

Our study deals with the physical environment at the metropolitan scale and we will, for the sake of convenience, treat the metropolitan center more or less as a single unit at that scale. We will not follow our observer as he enters the core. We are content, for the present, that he has brought us to the edge of it and has made us recognise it and appreciate some of the things it means to him.

Let us now return to the urban-rural fringe and try once again to capture the impressions and sensations of our observer as he drives to the metropolitan center.
Our observer has heard that Bedford—a few miles north of Concord—is the fastest growing town in Boston Region, in terms of new houses built and population added since 1950. He has also been told that the Bedford Airport and an M.I.T. weapons-systems research project give it a satellite economy of its own, and therefore a just claim to the appellation "town".

Apart from these items, he knows nothing at all about Bedford. He rarely has any occasion to visit it, although he might pass through it occasionally on a Sunday excursion, perhaps in fall—to admire the foliage. He cannot therefore see Bedford as would a local resident who knows his neighbors and his neighborhood intimately, but our observer's passing impressions of this part of his metropolis are nevertheless of legitimate interest to us.

Two and a half miles west of Route 128, three rural roads converge into a single main road, which
goes by a variety of names — Routes 4 and 25, The Great Road and Bedford Street — before it joins up with Massachusetts Avenue and runs on to the Charles Basin and the metropolitan core.

Let our observer begin at that first junction and drive through Bedford, southwest towards Boston. Everything he sees in Bedford is in sharp contrast to Concord. The latter seems old, rich, quietly reserved and even snobbish in its scrupulous kemptness. Bedford, by comparison, is new, economizing, ragged, brash and even archaic. Scores of miscellaneous shops, real estate offices, houses, gas stations and diners straggle along the roadside for two miles. Tall old trees remain close between them, wild bushland creeps up behind. The "tissue" or "grain" of building is fine and thin, mostly of a single storey and widely spread.

Our observer senses no progression, no culmination at a focal point. He does see a white church of the conventional New England form, set on the conventional smooth lawn at a crossroad. He wonders if this spot can be called the "town center". But nowhere along the two mile stretch does he experience
any sense of place, any quality of town-ship that tells him that he has arrived somewhere. 

He sees plenty of human activity - mostly people parking, loading and unloading cars and other vehicles - and driving is correspondingly difficult. Each business is set back from the road to provide a few parking places in front. There are no special-purpose parking lots, and no parking meters: these would be evidence of land-use specialization, cooperation in a sense, or of social controls.

Two miles from his point of origin, the observer is glad to see the buildings fade away until only an occasional house remains by the road. A spiky iron fence comes into view on the right, and behind it a park or a garden. There are flowers on the lawn, unusual in the otherwise unkempt bushscape. Then a gate, and a bronze plaque over it, saying "cemetery" - strange, no headstones.

+His image or gestalt of Bedford is one of splotchy confusion, expressive of anarchy. If the ex-urban culture of Bedford may be said to be as chaotic as the town itself appears, then the lack of any "center" or any "sense of place" is a true reflection of that culture. The man-made physical environment of Bedford may still be called an "ethnic domain" - for it is an atomized environment of an atomized culture.
Passing the cemetery, our observer begins to descend slowly and then emerges into a vast valley space, through which runs the metropolitan circumferential expressway Route 128. His road continues straight across the valley, passing over 128 without changing grade.

For a mile around the interchange, houses are loosely scattered. The tree-line holds back to the unbuilt hilltops. The houses outside Route 128 are newer, smaller, whiter and have less trees about them. They seem lonely, lost. They are patently of very low social status. Exposed and scattered, they seem out of scale and out of place in the splendor of the expressway and the valley.

Our observer slows down over the bridge and glances along the great channel of Route 128. He marvels at the fast and even flow of traffic in both directions. An urge to join the stream comes over him. He wants to know what lies around the distant curves. But he contents himself with the view of man-moulded topography at such a huge scale.

Past the interchange, the road suddenly dives into an older residential suburb, whose full extent
had previously been hidden by trees. Three signs slip by: SCHOOL, NO PASSING, and "LEXINGTON, the birthplace of American liberty, welcomes you".

The houses are mostly two-storied, the trees are tall, old and close by the road. There is no discernible order or pattern in the relationships of the houses to each other or indeed to the road, yet they do form a consistent texture and conform to a special character. The siting and landscaping create that "elusive leafy charm" typical of the "arcadian mode", analyzed so well by J.M. Richards.

But it is evident that this area was never arcadia proper. The road is not quite sufficiently twisty, the gardenscapes not quite romantic enough; lacking fences, in the American fashion, they are more ingenuous than mysterious. This is an old suburb, mellowed but also slightly tarnished by the years. It is pleasant, but no longer pretentious. Spiky gabled boxes predominate among the houses, for they are, in general, American Queen Anne, "vaguely Jacobean" as Osbert Lancaster calls it.

A magnificent, sculpturesque coal-loading tower stands by a single-track railway level-crossing.
What looks like an old stable, converted into a contractor's depot, is nearby. An open field alongside it is streaked with red, freshly painted bulldozer blades. An ancient cartwheel rests on a grassy verge; children ride bicycles. This seems a good place for children, all things considered.

Then a callous piece of modernity intrudes. Set behind a large parking lot, a treeless gap, is a small chain supermarket, tricked up in bright imitation of a traditional New England barn. A few yards further on, a rival flaunts Colonial fancy dress.

Our observer sees a 'bus. Not a yellow and orange Metropolitan Transit Authority 'bus, but a dun local one. The road bends and our observer drives alongside a small park, past an avenue of flagpoles, each higher than a man and flying the Stars and Stripes. The park is roofed with tall old trees. A stone cairn sits at the pointed end of the park, the road widens and bends in front of ponderously dignified brick buildings. Opposite, children are playing on a rich green lawn around a church. Straight ahead now lies a vista of shops.

The "park" is the old Lexington Common. The cairn of stones supports a Minute-Man statue. Both
denote emotion-charged concepts of history. The brick buildings on the edge of the shopping area seem to be public buildings of some kind. The shops themselves are at the core of Lexington Center.

The flags? It may be Columbus Day, Veteran's Day or any other national holiday, and there may have been a parade through the center.

The road through the center is especially wide for several hundred yards. There are highly organized parking markers and meters. The general appearance is neat and clean, a model for respectable suburbia. Here is a "place", but this sense is weakened because the road cuts right through the center of it, and there is not any illusion of "enclosure" — one is drawn on, without wishing to linger overlong.

Driving out of the center on its eastern side, our observer notices an imposing group of Town Offices and a Police Station, and later, an imposing facade, long with large windows and pilasters between. It seems like a High School; a frenzy of signs, warning motorists, confirms him. Then quasi-arcadia reasserts itself once more. The High School has been the largest building of all seen so far along this route.
Its very bulk expresses the importance given to education in the special conditions of American society; the signs, too, are very positive in their demands for safety and for the convenience of school children.

Soon the residences begin to thin out, and suddenly they end altogether. Open fields lie on both sides of the road. Housing picks up again after a few hundred yards, but it seems less expensive and less carefully landscaped than before.

Thus the journey through Lexington has been an extremely coherent one, at least when contrasted to the formlessness of Bedford. Approached from either direction, everything seen of Lexington runs to a climax at the town center - yet not an irrevocable, final climax, for in its origins and in its present function, Lexington center is a way-station, a clustering along a roadside which leads to and from the metropolitan core.

"Welcome to Arlington" says the notice somewhere in that open space that tells of the edge of Lexington. The road ahead forks, a sign points right for "Route 2 and Boston", and here the thru-
traveller would leave Mass Ave and cross over to the newer and faster Route 2, avoiding the torturous ribbon development of Arlington and Cambridge.

Our observer keeps to the left, along Mass. Ave, which now winds for three dreary miles to Arlington center. He cannot give any coherent structure to the experience of this stretch. He remembers that dilapidated shops line the road for most of the time, clustering particularly at one minor crossroad. He cannot give this crossroad any name or special identity. He is vaguely conscious of a gradual increase in the density of traffic, of human activity seen, and of a growing coarseness in the grain of building as he approaches Arlington center. Corresponding with this he vaguely realizes that the frequency of roadside trees gradually diminishes, and would, if pressed, say that the topography is mostly rising on the right hand side, falling away to the left of the road.

He notices two hills in the distance to the left. One is topped by a steel tower — possibly for water. On the other squarely sits an old house. He sees these two landmarks several times, sometimes
in line, sometimes with the tower to the left of the house, sometimes to the right. He becomes thoroughly confused.

He assumes that streetcars once ran along Mass Ave for there are rails still, only partially tarred over. He sees a squalid little shed at what seems to be a 'bus depot. Over the shed is a prim little sign, familiar on subway stations elsewhere in Boston, saying "Connections to all points" - a pathetic reminder of the interdependence of this and all those other metropolitan points.

Our observer is particularly struck by an absurd juxtaposition - a gasometer rearing and bulging over a roadside supermarket. Passing this, he sees ahead another long facade with pilasters and large windows on three floors - another High School. Beyond that is a square squat church tower of random stonework, and over trees on the left points a white church spire.

The quick succession of these things, remembered from previous journeys, tells him that he is approaching the Arlington center. He passes stone facades on the right, and then is caught between
rows of decaying two-storey shops. The white spired church stands back from the road at a busy traffic intersection in the heart of the business area. He gazes at the church while waiting for the lights to change and realizes that he has previously seen its spire from Route 2, over the trees of Spy Pond.

Everything about Arlington center seems dilapidated, dirty and inconvenient. Parking is bound to be a problem and the dog-legged intersections hold up traffic for hundreds of yards.

Finding his way carefully through these intersections, our observer feels glad that he doesn't live in Arlington, and makes a mental note never to use this road again if he can possibly help it. Certainly, he feels, it would be preferable to drive quite a long way to some isolated shopping cluster which had plenty of parking space rather than to try and do business here.

He passes several more decaying public buildings, a grotesque war memorial and scores of aggressive and yet faceless shops. There are also several blocks of brick apartments, the first seen on this route to central Boston.
The next mile is entirely without visible form to our observer. (He only knows it to be a mile because he looked it up on a map afterwards.) He feels lost, and anxious to escape his lost-ness. The ribbon of shops, old houses and miscellaneous structures is broken only by sets of traffic lights at seemingly identical intersections. Many of the shops are closed, many shops and old timber houses are converted to other uses. Many of the houses are of the two and three storey multiple family type common at one time in Boston. Most seem of timber. They increase in apparent age as our observer drives east, concentrating on the traffic, racing between intersections and trying to beat the lights, for remember, he is trying to escape. The traffic continually becomes heavier, until queues, four lanes wide, form at each intersection.

Perceived time and distance along this chaotic, patternless, stretch are greater than they would be along a structured, differentiated stretch of the same physical distance or time. Only one mile, yet seemingly so much longer.

The "Alewife Brook Parkway" runs through an open patch of low-lying land, so that the continuous
built-up area is dramatically interrupted by it. The name of Brook is incongruous for what appears in actuality to be a narrow concrete storm-water channel, chain-wire fenced. This very incongruity and ugliness does help, in fact, to fix an image of this spot in the mind.

This "Parkway" forms part of what is almost an inner-circumferential metropolitan highway. One sees it thus on a map, but does not sense it thus on the ground.

The next mile brings our observer to Porter Square. This stretch of Mass. Ave is even more disturbingly formless and squalid than the last. Less of the structures are being used for their original purposes, more have been converted in various ways. Not quite all are shops, many are decayed houses. Churches are dotted along the strip.

A railway level crossing must be negotiated. Travelling in the reverse direction at this crossing our observer remembers seeing the spire of Arlington church as well as the pantheon water-tower on Arlington Heights.

Driving is made especially difficult by street-
car tracks in the center of the road, particularly by their curbed safety-zones. These are memorable because of the intense irritation they cause drivers.

A large and aggressive Chevrolet billboard at the curve into Porter "Square" forces recognition. This billboard becomes for our observer a landmark, telling him, after several trips, that the North Cambridge "center" is near. The billboard is a simple and dramatically plain surface by comparison with the tormented shapes of buildings, smaller signs, street furniture, wirescape and so on.

The euphemism "Square" given to the traffic intersection and retail cluster around the North Cambridge railway station is typical of American cities. Our observer reflects that this kind of naming must be akin to the ancient beliefs in the magic efficacy of words. Put up a sign saying "Such and such Square", many Americans seem to believe, and it will be as effective as "abracadabra!" used to be in transforming reality.

There follows a long straightish stretch of road to the vicinity of Harvard Square. Apartments and multiple dwellings become the rule rather than the
exception, although no particular object is memorable until the Cambridge Common and the Harvard buildings come into view. Attention, for the driver at least, is then concentrated upon the traffic arrangements around this park, the patterns of which change from time to time.

Harvard Square provides the first sight on this trip of continuous facades more than two stories high. It can almost be said that the commercial buildings on one side, and the Harvard buildings on the other, do actually enclose a space which merits some special name, although nothing could be less accurate than "Square". The center and focus of this space is occupied by a shed over a subway entrance, surmounted by a large blue sign "Connections to all points" and "8 minutes to Park Street" — a form of advertising strange to some foreign eyes accustomed to regarding public transport as a public utility and not as a competing private enterprise — and yet a dramatic affirmation of Harvard Square's role as a metropolitan sub-center, closely linked to the metropolitan core. The sense of place, so absent since leaving Lexington, is rediscovered here; and
pedestrian activity is high, something which seems to be both cause and effect of that sense of place, to some extent at least. Thinking back, our observer notes that here in Harvard Square, for the first time on this trip, pedestrian flows seem to succeed in dominating vehicular traffic most of the time.

Even after more than a year of continuous use, the portion of Mass Ave between Harvard and Central "Squares" remains unstructured in the mind of our observer. He merely knows that having left one point, if he follows the road, he will arrive at the other. The intervening area through which he passes remains an unorganised welter of impressions.

Harvard Square and Central Square contrast one another in almost every characteristic of form, function and significance. Strong contrast at such close quarters makes for a certain amount of tension and of interest, even of vitality. Each of these Cambridge "centers" is the focus of different social groups; one oriented more or less towards education, enquiry, wealth and what passes for cosmopolitanism, the other bound up in the struggle for survival and so for bargains, at a lower level of aspiration.
The forms and functions of Harvard Square are the more highly differentiated. The "Square" itself is a partially enclosed space, but most people extend the denotation of the name to cover the series of side and back streets that lead from this space. That is to say, Harvard Square is a district in most people's minds, or if this is not true, then our observer thinks that it holds good at least for the comparative newcomers to Cambridge, before they have learned by prolonged experience to distinguish one part of the area from another. Each of the subsidiary spaces has a shape and character of its own, and there are shops, cinemas, eating and drinking places and quasi "cultural" institutions to suit a wide variety of tastes; these are partially segregated into groups of a similar character, but the element of surprise and incongruous juxtaposition is never quite absent.

In other words, Harvard Square fits the definition of a "core" previously given in the chapter on metropolitan regions. It exhibits the wide diversity of highly specialized activities that are characteristic of a city center, and, on a small scale, it is developing the segregation of uses of similar
character which everyone recognises to be so typical of metropolitan cores like New York, London and Paris.

Central Square is, on the other hand, a straightforward double ribbon of cut-rate stores lining the sides of what was, at one time, a major metropolitan radial road. Its focus may be said to lie somewhere between two unmistakable points - one being a classical bastion of Federal power, the Post Office building, opposite which is a curiously Romanesque monument to local autonomy, the Cambridge City Hall, while the other point is a level crossing of road and freight rail line on the edge of M.I.T. Between these points there tends to be some clustering of similar types of shops, but nothing like that degree of differentiation around Harvard Square, and unlike the latter, Central Square has little else but shops.

There is, of course, a great contrast between the people to be seen on the street and sidewalks of the two places. Once again, Harvard Square has the greater diversity, for it is not only a University center, but also one for the local people as well. Central Square on the other hand presents a greater superficial uniformity of care-worn faces and drab
clothing, although these crowds are made up of a wider cross-section of ethnic and age groups.

Central Square is especially squalid and depressing, or so our observer feels, in that its major function is tawdry and unrelieved commercialism. It seems less conscious of its proximity to the Boston core, for its subway entrances are not at all conspicuous, and casual observation reveals that this is primarily a local center for an inner suburb inhabited by low income groups, minority and immigrant groups. But there does not seem to be any particularly dominant ethnic group, and central Cambridge is not a true inner metropolitan slum of the highest density. It is neither one thing nor the other, and, in seeming consequence, faceless.

Our observer has parked for a few minutes, at a steep angle to the curb, in a long row of similarly parked vehicles which is perhaps the most imageable feature of Central Square. The sidewalk is crowded with people moving earnestly by; the only stationary bodies are those of a small group of young men, clinging to the security of a parking meter as to an anchor in the flowing stream of the sidewalk.
Central Square
Gli Italiani in Boston
Revore Mall

Photo: Vishan B.
They seem to be at a loose end, wondering what to do, but without any wish to do anything in particular. They are speaking Italian among themselves, and our observer takes this as a clue to their most un-north-american behavior.... can it be that they are trying to recreate in this new environment the piazza-lounging habits of their native land? No wonder, then, that they look so disconsolate, for not only are they now conspicuously out-of-step with everyone around them, but the physical environment of Central Square has been designed as the direct antithesis of an Italian piazza. Maximum exposure, maximum movement, maximum retail sales - these are the operational goals for which Central Squarestrives, and which are truly irrelevant on a grand scale to those of the Piazze.

Because his eyes are deliberately searching for things to see, our observer notices that from where he stands in the middle of Central Square there is a fine vista down Mass. Ave, closed by the dome of M.I.T. But he doubts that more than one other in a thousand notices the same thing, for the visual static of thousands of signs and hundreds of automobiles makes this long and quiet view almost impossible to see.
It is obvious from the foregoing that our observer has experienced more intimate and frequent contact with these inner sub-centers of Cambridge than he has with the other areas passed through on this trip. This unbalanced view is, however, typical of metropolitan inhabitants. Some areas they know "like the palm of their hand" while others they view through the small end of the telescope, simplifying, generalizing.

Moving warily again down the congested Mass. Ave through and past Central Square, our observer waits now while a creaking procession of freight cars moves past at the level crossing. A romantic cavalcade of railroad symbols and names passes before his eyes, and, on this occasion, he enjoys the delay.

Over the crossing at last, he drives around the smooth curve in front of the grey and cold magnificence of the main M.I.T. buildings, ambiguously softened by lines of new, spindly trees. The sight of M.I.T. is the sign that our observer has arrived at the Charles River Basin and is about to cross into the metropolitan core.
Everything about the physical environment of M.I.T. is in dramatic contrast to that of Harvard. The blatant differences in architectural treatment seem to our observer to be directly expressive of the different sentiments and phantasies which seem to have stirred their builders over the years. One chose the reticence and reserve of Georgian, the other the enthusiastic optimism of Classic Revival which took such a strong hold among the newly rich at the beginning of the century.

Harvard has no front door. M.I.T. has, and it spills and gathers right on the sidewalk of Mass. Ave. Harvard focusses inward onto its Yard; M.I.T. proclaims itself outward along axes. Harvard students come and go through many doors and inconspicuous holes. Once outside the Yard, they tend to merge with the general bustle of Harvard Square. M.I.T. students tend to come and go through the one great door, and are exposed and isolated on the street to the curious gaze of all those passing by in autos and 'buses.

The conflict of pedestrians and drivers is irritating and dangerous to both, yet at the same time, this confrontation somehow expresses the idea that M.I.T.
is not aloof from the rough and tumble problems of everyday real life.

Hundreds of thousands of people must pass by Harvard and M.I.T. annually; their "images" of these institutions must be formed partly by what they read and hear concerning them, but also partly by what they feel about the buildings and the students they see. Perhaps one day soon, reflects our observer, someone will carry out the necessary number of depth interviews among various groups of passers-by to discover what part the visual perception of physical physiognomy plays in the building of "institutional images".

Driving past M.I.T., crossing Memorial Drive at a memorably dangerous intersection, our observer has reached the edge of the metropolitan core. He continues on to cross the bridge in front of him, and experiences the same view to his left which has previously been dealt with as the climax to the Route 2 trip.

In the near future, as our observer knows from

+ he once suffered a slight accident there.
the newspapers, the towers of the new Prudential Center will dominate the skyline directly ahead of him, rising higher than the John Hancock building does now. Prudential Center will be the first major central redevelopment project built in Boston. A series of shiny new blocks in the center will begin to reverse the process of decay which has been spreading outwards from the core. The gradient of increasing age which our observer has experienced from the metropolitan periphery inwards may prove only to be a temporary phase in an evolutionary cycle. At any rate, our man cherishes this hope, he is incurably an urbanist.

The insurance company's city-within-a-city is due to be followed by a Government Center around the Scollay Square district, far over to the left of his present vista. The view from Charles Basin should be enlivened and enriched by the two projects together. The Government Center will be the logical and expressive outcome of the growing necessity for governmental intervention in an ever more complex society. Placed at one end of the skyline, it will tend to balance the symbols and aspirations of the public
interest against those of the large private organizations on the opposite edge of the core. Our observer looks forward to comparing and relating them in this daily distant view of his, and to seeing how their characters will differ when experienced at ground level.
NOTES AND REFERENCES

1. From a speech inaugurating the school building program in England immediately after the close of World War II.

2. Many enquirers have exhaustively studied the correlations between environments (urban, rural, slum, non-slum) and the height, weight and health of residents. For example, see Louis Chevalier, Urban Communities and the Social Evolution of Nations, a paper in the symposium The Metropolis in Modern Life. New York: Doubleday, 1955.

3. Durrell gives significant poetic form to the action of the Eastern Mediterranean environment on a handful of people whose native or adopted city is Alexandria, in the course of which he writes, "As a poet of the historic consciousness, I suppose I am bound to see landscape as a field dominated by the human wish - tortured into farms and hamlets, ploughed into cities. A landscape scribbled with the signatures of men and epochs. Now, however, I am beginning to believe that the wish is inherited from the site; that man depends for the furniture of the will upon his location in place, tenant of fruitful acres or a perverted wood." (p. 112) and "We are children of our landscape, it dictates behaviour and even thought in the measure to which we are responsive to it. I can think of no better identification." (p. 41) See Lawrence Durrell, Justine. London: Faber and Faber, 1957.

Kazin's autobiographical lyric A Walker in the City is another finely wrought case-study. He expresses the "rage mixed with dread and some unexpected tenderness" which now colors the author's image of the early hopelessness of a childhood spent "at the end of the world"

Kandinsky's own feelings about the effect of the sights and sounds of his Moscow childhood and youth are quoted as an example at the opening of Chapter II herein. See Willi Grohmann, Wassily Kandinsky, Life and Work. New York: Harry N. Abrams Inc., 1958.

The life work of the painter Mondrian seems to be inextricably bound up in his early intimacy with the Dutch landscape. Siegfried Giedion has related, in a Harvard seminar, his belief that the flat and rectangular forms so dominant in the Dutch landscape must have played a large part in inspiring the artists of the De Stijl group. For evidence in support of this idea, see Michel Seuphor, Piet Mondrian, Life and Work. New York: Harry N. Abrams Inc., undated, approx. 1957.

For Mondrian's own analysis of his reactions to physical environment, see his Natural Reality and Abstract Reality, an essay in dialogue form, De Stijl Magazine, 1919-1920, republished in Seuphor's Life and Work. The dialogue takes place during the course of a "walk which begins in the country and ends in the city," proceeding through seven scenes.

Sir Herbert Read has emphasized that the images created in Mondrian's paintings were merely pointers towards a "total reconstruction of our environment." Taking his cue directly from Mondrian's dialogue-essay, Read wrote: "The future scale of the artist is not domestic, nor even monumental, but environmental: the artist of the future will not be a painter, or a sculptor or an architect, but a new moulder of plastic forms who will be a painter and sculptor and architect in one..." See Sir Herbert Read, Ikon and Idea, The Function of Art in the Development of Human Consciousness.
Mondrian's paintings catalogue his passionate search for the abstract reality of his environment, culminating in his final Broadway Boogie-Woogie. But he tells us in his writing that this search "merely paves the way for the transformation of social life, including the appearances of things around us." His concepts of "interiorized externality" which seeks a clearer and more precise expression of itself in external things, is especially relevant to the discussion of "expression" in part III hereof.

Marcel Proust's great novel has proved the fountainhead of an enormous outpouring of childhood memoirs in literature and one of the most important aspects of his writing was his sensitivity to physical environment. Professor Kevin Lynch has drawn attention to one particularly outstanding example - that of Proust's description of the meaning and significance of the steeple at St. Hilaire at Cambray, the house of many childhood summers. See Kevin Lynch, The City Image. Unpublished manuscript, M.I.T., 1958, pp. 26-28.

Louis Sullivan, born on South Bennet Street, Boston, raised in Newburyport and what is now Wakefield, Mass., and later sent to school in Boston, has left us many details of his reactions to these physical environments in his autobiography. Buildings, and all the many physiognomies of the environment, spoke to the young Sullivan "in their many jargons". Some "said vile things, some said prudent things, some said pompous things, but none (of the buildings in Boston) said noble things." See Louis H. Sullivan, The Autobiography of an Idea. New York: Dover Publications, Inc., 1956, (first edition, 1924). Sullivan opens and concludes his Chapter II with lines from the Whitman poem employed on the title page of this present work.
4. See particularly the work of men such as Boas (Kwakiutl), Westermann (Sudan), and Codrington (Melanesian). Professor Lynch also gives many leads of this kind in his manuscript referred to above. Further, see various works relating ways of conceiving spaces to environmental forms, such as Niessen on Graeco-Roman temple enclosures and Mumford's presently developing concept of the earliest houses and cities as "containers".

5. Sounds, (more precisely "phonemes") devoid of previously established conventional meaning or acquired symbolism, seem to be perceived as expressive of feeling, both by he who forms them and he who hears, and the expressiveness is, at the most fundamental level, a matter of spatial distance, position and movement, of threat, recoil, rising, falling, etc., analogic with the modulation of the breath, and movement of lips, tongue and palate. It has been argued that language develops as an increasing complexity of distinctions between one sound and another; that spatial distinctions are at the root of all other distinctions; and further that most spatial distinctions are made in analogy with the human body as it is felt to be oriented in "perceived" or "mythic" space.


Susanne K. Langer, Philosophy in a New Key, A Study of Reason, Rite and Art, Cambridge, Mass: Harvard Univ. Press, 1942. See especially Chapter III.


6. For examples, see Wölfflin, H. The Sense of Form in Art, his most recently translated work published in New York by the Chelsea Publishing Co., 1958. Here Wölfflin uses the contrasts between Italian Renaissance and 16th century
German art to contrast the indistinct plasticity of Northern European art with the comprehensive visibility of pure form in Mediterranean art.


R.D. Martienssen, *The Idea of Space in Greek Architecture*, Johannesburg: Witwatersrand Univ. Press, 1956. "The constant factor that makes the Ionian cities recognizable as belonging to a category of cities is the underlying attitude that is reflected in its completion..." (p. 37).

The major works of architectural and urban historians and commentators like Lewis Mumford, Nicholas Pevsner, Steen Eiler Rasmussen and Bruno Zevi are too well known to need specific reference. What unites them all is the common task of discovering and demonstrating the links between culture patterns and man-made environmental forms.

7. For example, see the special number of the Architectural Review, London, December, 1950. *Man-Made America*, especially the Introduction to this special number.


II- MAN-ENVIRONMENT INTERACTION; PARTICIPATION, MUTUAL DEVELOPMENT.

1. Willi Grohmann, op.cit., p. 13. Kandinsky was born in Moscow in 1866, moved to Odessa at age five, returning each summer between ages 13-19, and moved back to Moscow as a student between ages 19-30, after which he left Moscow never to return.
Kandinsky seems to have had few memories of Odessa, but his involvement with Moscow was such that he could say, "Every city has one face, but Moscow has ten faces."

2. The term "mémento collective" is here used in the sense given it by Maurice Halbwachs in his unfinished work of that name. See Maurice Halbwachs, La Mémoire Collective, Paris: Presses Universitaires de France, 1950.

The term "discoursive" is here used in the sense and with the distinction made for it by Susanne K. Langer, op. cit., (5). The symbolic "logic" with which I am primarily concerned in this enquiry is, in Langer's sense, "non-discoursive".


4. Ibid., see the definitions given in the introduction.

4a. This later stage of the ECM interaction is taken up in greater detail in Chapter IV of this work, where the empirical observations of Floyd Hunter are presented. See Floyd Hunter, Community Power Structure, A Study of Decision-Makers, Chapel Hill: The Univ. of North Carolina Press, 1953, pp. 12-18, and 20-23.


III- MAN-ENVIRONMENT INTERACTION: PERCEPTION, IMAGE-MAKING, ORIENTATION.


Gyorgy Kepes, The Language of Vision.


4. "(man) ... has so enveloped himself in linguistic forms, in artistic images, in mythical symbols or religious rites that he cannot see or know anything except by the interposition of this artificial medium (symbolizing activity)"

Cassirer, op. cit., I, 5, p. 43.

Cf. Langer, op. cit., I, 5, Chapter 4, Discursive and Presentational Forms.


Cf. Wolfgang Köhler, op. cit., III, 2, p. 208:--

"It is precisely the original organization and segregation of circumscribed wholes which make it possible for the sensory world to appear so utterly imbued with meaning to the adult because in its gradual entry into the sensory field meaning follows the lines drawn by natural organization! Arnheim's hypothesis of "isomorphic" correlations between the structural configuration of forms and feelings is a development of this kind of statement by Köhler. Arnheim postulates that a perceptual act creates a configuration of electro-chemical forces in the cortical field, grouped according to Wertheimer's rules. Arnheim asks
"why should not the strains and stresses of the cortical forces themselves also have their psychological counterpart. It seems plausible that they represent the physiological equivalent of what is experienced as expression. Such a theory makes expression an integral part of the elementary process of perception." (p. 163).

The existing state of knowledge of the human nervous system does not allow proof or disproof of this kind of hypothesis.

7. Susanne K. Langer, Feeling and Form, op. cit., III, 3, p. 27.
Cf. Arnheim, Art and Visual Perception, op. cit., III, 3, p. 368: "Motifs like rising and falling, dominance and submission, weakness and strength, harmony and discord, struggle and conformance, underlie all existence. We find them in our own mind and in our relations with other people, in the human community and in the events of nature. Perception of expression fulfills its spiritual mission only if we experience in it more than the resonance of our own feelings. It permits us to realize that the forces stirring in ourselves are only individual examples of the same forces throughout the universe. We are thus enabled to sense our place in the whole and the inner unity of that whole.
"The key is light
and light illuminates shapes
and shapes have emotional power ..."

... by their capacity to endure,
structure,
astuteness, boldness, even temerity,
the play of those vital abstractions
which are the essential qualities
the components of architecture,"
Cf. F.L. Wright, An Autobiography, New York: Longmans Green and Co., 1932, p. 155: "Geometric shapes through human sensibility have thus acquired to some extent human significance as, say, the cube or square, integrity; the circle or sphere, infinity; the straight line, rectitude;
the straight line, rectitude; if long drawn out ... repose; the triangle, aspiration etc."

8. See Heinz Werner, op. cit., III, 3, p. 280
"During the last two decades there has occurred a rather revolutionary, though little noticed shift in the attitudes of academic psychology toward the problem of perception. This shift is primarily due to the growing recognition of the 'projective' or 'expressive' nature of perception. The nineteenth century psychologists, studying visual processes by intricate laboratory techniques, insisted on the purely sensory nature of perception... Among psychologists of today, there is a growing conviction that this hiatus (between scientific psychology and aesthetics) must and can be bridged by expanding the study of perception beyond that of sensory processes into the problem area of psychological dynamics which includes aesthetic behaviour."


10. For a brief presentation of these concepts see Heinz Werner, op. cit., III, 8.


12. Ibid., p. 41.

13. Ibid., p. 36


15. Richard Neutra, Notes to the Young Architect, Perspecta, the Yale Architectural Journal, No. 4., 1957, p. 54.
"I have said that organization is a property of the visual field. This account is incomplete since it includes neither the self as a member of the field nor that particular attitude of so-called attention or interest which, as it were, was a direction in the field from the self to the diagrams. Bipolar organization varies according to all the nuances of emotional attitude towards objects and events..."

19. Ibid., cf., p. 319:-
"The field of the brain, as a physical system which is the locus of the processes underlying objective experience, will also contain processes corresponding to the experience of the "self". cf., p. 354:-
"Between the attitude and its sensory basis we experience what in German is called Ihr sachlicher Zusammenhang - 'their intrinsic hanging together'!".


23. Not all of Lynch's experiments enjoined an attitude of"way-finding" upon their participants. See
Kevin Lynch, Go Take a Walk Around the Block, M.I.T. unpublished Ms., mimeograph, 35pp., undated.

24. For Lynch's own views on the relationship of "meaning" to "identity" and "structure" see The City Image, op. cit., I, 3, p. 4. and p. 162.


29. Statement by Merle Lawrence, Dept. of Psychology, Princeton University.

30. Ibid.,


32. Ibid., p. 54.

34. Ibid., p. 18 et seq. Also Kurt Lewin, Psycho-sociological Problems of a Minority Group, op. cit., II, 6.

35. Ibid., p. 24.


37. Ibid.,

IV- RELEVANCE OF THE HYPOTHESES TO THE PUBLIC INTEREST


2. Ibid., p. 23.
