

I.

THE IMAGE OF THE ENVIRONMENT

Looking at cities can give a special pleasure, however commonplace the sight may be. Like a piece of architecture, the city is a construction in space, but one of vast scale, a thing perceived only in the course of long spans of time. City design is therefore a temporal art, but it can rarely use the controlled and limited sequences of other temporal arts like music. On different occasions and for different people, the sequences are reversed, interrupted, abandoned, cut across. It is seen in all lights and all weathers.

At every instant, there is more than the eye can see, more than the ear can hear, a setting or a view waiting to be explored. Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences. Washington Street set in a farmer's field might look like the shopping street in the heart of Boston, and yet it would seem utterly different. Every citizen has had long associations with some part of his city, and his image is soaked in memories and meanings.

Moving elements in a city, and in particular the people and their activities, are as important as the stationary physical parts. We are not simply observers of this spectacle, but are ourselves a part of it, on the stage with the other participants. Most often, our perception of the city is not sustained, but rather partial, fragmentary, mixed with other concerns. Nearly every sense is in operation, and the image is the composite of them all.

Not only is the city an object which is perceived (and perhaps enjoyed) by millions of people of widely diverse class and character, but it is the product of many builders who are constantly modifying the structure for reasons of their own. While it may be stable in general outlines for some time, it is ever changing in detail. Only partial control can be exercised over its growth and form. There is no final result, only a continuous succession of phases. No wonder, then, that the art of shaping cities for sensuous enjoyment is an art quite separate from architecture or music or literature. It may learn a great deal from these other arts, but it cannot imitate them.

A beautiful and delightful city environment is an oddity, some would say an impossibility. Not one American city larger than a village is of consistently fine quality, although a few towns have some pleasant fragments. It is hardly surprising, then, that most Americans have little idea of what it can mean to live in such an environment. They are clear enough about the ugliness of the world they live in, and they are quite vocal about the dirt, the smoke, the heat, and the congestion, the chaos and yet the monotony of it. But they are hardly aware of the potential value of harmonious surroundings, a world which they may have briefly glimpsed only as tourists or as escaped vacationers. They can have little sense of what a setting can mean in terms of daily delight, or as a continuous anchor for their lives, or as an extension of the meaningfulness and richness of the world.

This book will consider the visual quality of the American city by studying the mental image of that city which is held by its citizens. It will concentrate especially on one particular visual quality: the apparent clarity or "legibility" of the cityscape. By this we mean the ease with which its parts can be recognized

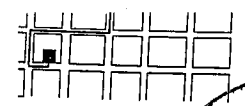
and can be organized into a coherent pattern. Just as this printed page, if it is legible, can be visually grasped as a related pattern of recognizable symbols, so a legible city would be one whose districts or landmarks or pathways are easily identifiable and are easily grouped into an over-all pattern.

This book will assert that legibility is crucial in the city setting; will analyze it in some detail, and will try to show how this concept might be used today in rebuilding our cities. As will quickly become apparent to the reader, this study is a preliminary exploration, a first word not a last word, an attempt to capture ideas and to suggest how they might be developed and tested. Its tone will be speculative and perhaps a little irresponsible: at once tentative and presumptuous. This first chapter will develop some of the basic ideas; later chapters will apply them to several American cities and discuss their consequences for urban design.

Although clarity or legibility is by no means the only important property of a beautiful city, it is of special importance when considering environments at the urban scale of size, time, and complexity. To understand this, we must consider not just the city as a thing in itself, but the city being perceived by its inhabitants.

Structuring and identifying the environment is a vital ability among all mobile animals. Many kinds of cues are used: the visual sensations of color, shape, motion, or polarization of light, as well as other senses such as smell, sound, touch, kinesthesia, sense of gravity, and perhaps of electric or magnetic fields. These techniques of orientation, from the polar flight of a tern to the path-finding of a limpet over the micro-topography of a rock, are described and their importance underscored in an extensive literature.^{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100} Psychologists have also studied this ability in man, although rather sketchily or under limited laboratory conditions.^{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100} Despite a few remaining puzzles, it now seems unlikely that there is any mystic "instinct" of way-finding. Rather there is a consistent use and organization of definite sensory cues from the external environment. This organization is fundamental to the efficiency and to the very survival of free-moving life.





To become completely lost is perhaps a rather rare experience for most people in the modern city. We are supported by the presence of others and by special way-finding devices: maps, street numbers, route signs, bus placards. But let the mishap of disorientation once occur, and the sense of anxiety and even terror that accompanies it reveals to us how closely it is linked to our sense of balance and well-being. The very word "lost" in our language means much more than simple geographical uncertainty; it carries overtones of utter disaster.

In the process of way-finding, the strategic link is the environmental image, the generalized mental picture of the exterior physical world that is held by an individual. This image is the product both of immediate sensation and of the memory of past experience, and it is used to interpret information and to guide action. The need to recognize and pattern our surroundings is so crucial, and has such long roots in the past, that this image has wide practical and emotional importance to the individual. Obviously a clear image enables one to move about easily and quickly: to find a friend's house or a policeman or a button store. But an ordered environment can do more than this; it may serve as a broad frame of reference, an organizer of activity or belief or knowledge. On the basis of a structural understanding of Manhattan, for example, one can order a substantial quantity of facts and fancies about the nature of the world we live in. Like any good framework, such a structure gives the individual a possibility of choice and a starting-point for the acquisition of further information. A clear image of the surroundings is thus a useful basis for individual growth.

- ③ A vivid and integrated physical setting, capable of producing a sharp image, plays a social role as well. It can furnish the raw material for the symbols and collective memories of group communication. A striking landscape is the skeleton upon which many primitive races erect their socially important myths. Common memories of the "home town" were often the first and easiest point of contact between lonely soldiers during the war.
- ④ A good environmental image gives its possessor an important sense of emotional security. He can establish an harmonious relationship between himself and the outside world. This is the

obverse of the fear that comes with disorientation; it means that the sweet sense of home is strongest when home is not only familiar but distinctive as well.

- ⑤ Indeed, a distinctive and legible environment not only offers security but also heightens the potential depth and intensity of human experience. Although life is far from impossible in the visual chaos of the modern city, the same daily action could take on new meaning if carried out in a more vivid setting. Potentially, the city is in itself the powerful symbol of a complex society. If visually well set forth, it can also have strong expressive meaning.

It may be argued against the importance of physical legibility that the human brain is marvelously adaptable, that with some experience one can learn to pick one's way through the most disordered or featureless surroundings. There are abundant examples of precise navigation over the "trackless" wastes of sea, sand, or ice, or through a tangled maze of jungle.

Yet even the sea has the sun and stars, the winds, currents, birds, and sea-colors without which unaided navigation would be impossible. The fact that only skilled professionals could navigate among the Polynesian Islands; and this only after extensive training, indicates the difficulties imposed by this particular environment. Strain and anxiety accompanied even the best-prepared expeditions.

In our own world, we might say that almost everyone can, if attentive, learn to navigate in Jersey City, but only at the cost of some effort and uncertainty. Moreover, the positive values of legible surroundings are missing: the emotional satisfaction, the framework for communication or conceptual organization, the new depths that it may bring to everyday experience. These are pleasures we lack, even if our present city environment is not so disordered as to impose an intolerable strain on those who are familiar with it.

It must be granted that there is some value in mystification, labyrinth, or surprise in the environment. Many of us enjoy the House of Mirrors, and there is a certain charm in the crooked streets of Boston. This is so, however, only under two conditions. First, there must be no danger of losing basic form or

See Appendix A

Jersey City is discussed in Chapter 2

orientation, of never coming out. The surprise must occur in an over-all framework; the confusions must be small regions in a visible whole. Furthermore, the labyrinth or mystery must in itself have some form that can be explored and in time be apprehended. Complete chaos without hint of connection is never pleasurable.

But these second thoughts point to an important qualification. The observer himself should play an active role in perceiving the world and have a creative part in developing his image. He should have the power to change that image to fit changing needs. An environment which is ordered in precise and final detail may inhibit new patterns of activity. A landscape whose every rock tells a story may make difficult the creation of fresh stories. Although this may not seem to be a critical issue in our present urban chaos, yet it indicates that what we seek is not a final but an open-ended order, capable of continuous further development.

ing the Image

Environmental images are the result of a two-way process between the observer and his environment. The environment suggests distinctions and relations, and the observer—with great adaptability and in the light of his own purposes—selects, organizes, and endows with meaning what he sees. The image so developed now limits and emphasizes what is seen, while the image itself is being tested against the filtered perceptual input in a constant interacting process. Thus the image of a given reality may vary significantly between different observers.

The coherence of the image may arise in several ways. There may be little in the real object that is ordered or remarkable, and yet its mental picture has gained identity and organization through long familiarity. One man may find objects easily on what seems to anyone else to be a totally disordered work table. Alternatively, an object seen for the first time may be identified and related not because it is individually familiar but because it conforms to a stereotype already constructed by the observer. An American can always spot the corner drugstore, however indistinguishable it might be to a Bushman. Again, a new object

may seem to have strong structure or identity because of striking physical features which suggest or impose their own pattern. Thus the sea or a great mountain can rivet the attention of one coming from the flat plains of the interior, even if he is so young or so parochial as to have no name for these great phenomena.

As manipulators of the physical environment, city planners are primarily interested in the external agent in the interaction which produces the environmental image. Different environments resist or facilitate the process of image-making. Any given form, a fine vase or a lump of clay, will have a high or a low probability of evoking a strong image among various observers. Presumably this probability can be stated with greater and greater precision as the observers are grouped in more and more homogeneous classes of age, sex, culture, occupation, temperament, or familiarity. Each individual creates and bears his own image, but there seems to be substantial agreement among members of the same group. It is these group images, exhibiting consensus among significant numbers, that interest city planners who aspire to model an environment that will be used by many people.

Therefore this study will tend to pass over individual differences, interesting as they might be to a psychologist. The first order of business will be what might be called the "public images," the common mental pictures carried by large numbers of a city's inhabitants: areas of agreement which might be expected to appear in the interaction of a single physical reality, a common culture, and a basic physiological nature.

The systems of orientation which have been used vary widely throughout the world, changing from culture to culture, and from landscape to landscape. Appendix A gives examples of many of them: the abstract and fixed directional systems, the moving systems, and those that are directed to the person, the home, or the sea. The world may be organized around a set of focal points, or be broken into named regions, or be linked by remembered routes. Varied as these methods are, and inexhaustible as seem to be the potential clues which a man may pick out to differentiate his world, they cast interesting side-lights on the means that we use today to locate ourselves in our own city world. For the

most part these examples seem to echo, curiously enough, the formal types of image elements into which we can conveniently divide the city image: path, landmark, edge, node, and district. These elements will be defined and discussed in Chapter 3.

An environmental image may be analyzed into three components: identity, structure, and meaning. It is useful to abstract these for analysis, if it is remembered that in reality they always appear together. A workable image requires first the identification of an object, which implies its distinction from other things, its recognition as a separable entity. This is called identity, not in the sense of equality with something else, but with the meaning of individuality or oneness. Second, the image must include the spatial or pattern relation of the object to the observer and to other objects. Finally, this object must have some meaning for the observer, whether practical or emotional. Meaning is also a relation, but quite a different one from spatial or pattern relation.

Thus an image useful for making an exit requires the recognition of a door as a distinct entity, of its spatial relation to the observer, and its meaning as a hole for getting out. These are not truly separable. The visual recognition of a door is mated together with its meaning as a door. It is possible, however, to analyze the door in terms of its identity of form and clarity of position, considered as if they were prior to its meaning.

Such an analytic feat might be pointless in the study of a door, but not in the study of the urban environment. To begin with, the question of meaning in the city is a complicated one. Group images of meaning are less likely to be consistent at this level than are the perceptions of entity and relationship. Meaning, moreover, is not so easily influenced by physical manipulation as are these other two components. If it is our purpose to build cities for the enjoyment of vast numbers of people of widely diverse background—and cities which will also be adaptable to future purposes—we may even be wise to concentrate on the physical clarity of the image and to allow meaning to develop without our direct guidance. The image of the Manhattan sky-

line may stand for vitality, power, decadence, mystery, congestion, greatness, or what you will, but in each case that sharp picture crystallizes and reinforces the meaning. So various are the individual meanings of a city, even while its form may be easily communicable, that it appears possible to separate meaning from form, at least in the early stages of analysis. This study will therefore concentrate on the identity and structure of city images.

If an image is to have value for orientation in the living space, it must have several qualities. It must be sufficient, true in a pragmatic sense, allowing the individual to operate within his environment to the extent desired. The map, whether exact or not, must be good enough to get one home. It must be sufficiently clear and well integrated to be economical of mental effort: the map must be readable. It should be safe, with a surplus of clues so that alternative actions are possible and the risk of failure is not too high. If a blinking light is the only sign for a critical turn, a power failure may cause disaster. The image should preferably be open-ended, adaptable to change, allowing the individual to continue to investigate and organize reality: there should be blank spaces where he can extend the drawing for himself. Finally, it should in some measure be communicable to other individuals. The relative importance of these criteria for a "good" image will vary with different persons in different situations; one will prize an economical and sufficient system, another an open-ended and communicable one.

Since the emphasis here will be on the physical environment as the independent variable, this study will look for physical qualities which relate to the attributes of identity and structure in the mental image. This leads to the definition of what might be called *imageability*: that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. It is that shape, color, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment. It might also be called *legibility*, or perhaps *visibility* in a heightened sense,

where objects are not only able to be seen, but are presented sharply and intensely to the senses.

Half a century ago, Stern discussed this attribute of an artistic object and called it *apparency*.⁷⁴ While art is not limited to this single end, he felt that one of its two basic functions was "to create images which by clarity and harmony of form fulfill the need for vividly comprehensible appearance." In his mind, this was an essential first step toward the expression of inner meaning.

A highly imageable (apparent, legible, or visible) city in this peculiar sense would seem well formed, distinct, remarkable; it would invite the eye and the ear to greater attention and participation. The sensuous grasp upon such surroundings would not merely be simplified, but also extended and deepened. Such a city would be one that could be apprehended over time as a pattern of high continuity with many distinctive parts clearly interconnected. The perceptive and familiar observer could absorb new sensuous impacts without disruption of his basic image, and each new impact would touch upon many previous elements. He would be well oriented, and he could move easily. He would be highly aware of his environment. The city of Venice might be an example of such a highly imageable environment. In the United States, one is tempted to cite parts of Manhattan, San Francisco, Boston, or perhaps the lake front of Chicago.

These are characterizations that flow from our definitions. The concept of imageability does not necessarily connote something fixed, limited, precise, unified, or regularly ordered, although it may sometimes have these qualities. Nor does it mean apparent at a glance, obvious, patent, or plain. The total environment to be patterned is highly complex, while the obvious image is soon boring, and can point to only a few features of the living world.

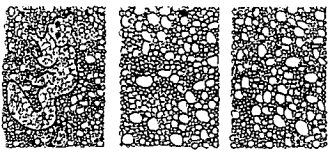
The imageability of city form will be the center of the study to follow. There are other basic properties in a beautiful environment: meaning or expressiveness, sensuous delight, rhythm, stimulus, choice. Our concentration on imageability does not deny their importance. Our purpose is simply to consider the need for identity and structure in our perceptual world, and to illustrate the special relevance of this quality to the particular case of the complex, shifting urban environment.

Since image development is a two-way process between observer and observed, it is possible to strengthen the image either by symbolic devices, by the retraining of the perceiver, or by reshaping one's surroundings. You can provide the viewer with a symbolic diagram of how the world fits together: a map or a set of written instructions. As long as he can fit reality to the diagram, he has a clue to the relatedness of things. You can even install a machine for giving directions, as has recently been done in New York.⁴⁹ While such devices are extremely useful for providing condensed data on interconnections, they are also precarious, since orientation fails if the device is lost, and the device itself must constantly be referred and fitted to reality. The cases of brain injury noted in Appendix A illustrate the anxiety and effort that attend complete reliance on such means. Moreover, the complete experience of interconnection, the full depth of a vivid image, is lacking.

You may also train the observer. Brown remarks that a maze through which subjects were asked to move blindfolded seemed to them at first to be one unbroken problem. On repetition, parts of the pattern, particularly the beginning and end, became familiar and assumed the character of localities. Finally, when they could tread the maze without error, the whole system seemed to have become one locality.⁸ DeSilva describes the case of a boy who seemed to have "automatic" directional orientation, but proved to have been trained from infancy (by a mother who could not distinguish right from left) to respond to "the east side of the porch" or "the south end of the dresser."⁷¹

Shipton's account of the reconnaissance for the ascent of Everest offers a dramatic case of such learning. Approaching Everest from a new direction, Shipton immediately recognized the main peaks and saddles that he knew from the north side. But the Sherpa guide accompanying him, to whom both sides were long familiar, had never realized that these were the same features, and he greeted the revelation with surprise and delight.⁷⁰

Kilpatrick describes the process of perceptual learning forced on an observer by new stimuli that no longer fit into previous images.⁴¹ It begins with hypothetical forms that explain the new stimuli conceptually, while the illusion of the old forms persists.



The personal experience of most of us will testify to this persistence of an illusory image long after its inadequacy is conceptually realized. We stare into the jungle and see only the sunlight on the green leaves, but a warning noise tells us that an animal is hidden there. The observer then learns to interpret the scene by singling out "give-away" clues and by reweighting previous signals. The camouflaged animal may now be picked up by the reflection of his eyes. Finally by repeated experience the entire pattern of perception is changed, and the observer need no longer consciously search for give-aways, or add new data to an old framework. He has achieved an image which will operate successfully in the new situation, seeming natural and right. Quite suddenly the hidden animal appears among the leaves, "as plain as day."

In the same way, we must learn to see the hidden forms in the vast sprawl of our cities. We are not accustomed to organizing and imaging an artificial environment on such a large scale; yet our activities are pushing us toward that end. Curt Sachs gives an example of a failure to make connections beyond a certain level.⁶⁴ The voice and drumbeat of the North American Indian follow entirely different tempos, the two being perceived independently. Searching for a musical analogy of our own, he mentions our church services, where we do not think of coordinating the choir inside with the bells above.

In our vast metropolitan areas we do not connect the choir and the bells; like the Sherpa, we see only the sides of Everest and not the mountain. To extend and deepen our perception of the environment would be to continue a long biological and cultural development which has gone from the contact senses to the distant senses and from the distant senses to symbolic communications. Our thesis is that we are now able to develop our image of the environment by operation on the external physical shape as well as by an internal learning process. Indeed, the complexity of our environment now compels us to do so. Chapter 4 will discuss how this might be done.

Primitive man was forced to improve his environmental image by adapting his perception to the given landscape. He could effect minor changes in his environment with cairns, beacons,

or tree blazes, but substantial modifications for visual clarity or visual interconnection were confined to house sites or religious enclosures. Only powerful civilizations can begin to act on their total environment at a significant scale. The conscious remodeling of the large-scale physical environment has been possible only recently, and so the problem of environmental imageability is a new one. Technically, we can now make completely new landscapes in a brief time, as in the Dutch polders. Here the designers are already at grips with the question of how to form the total scene so that it is easy for the human observer to identify its parts and to structure the whole.³⁰

We are rapidly building a new functional unit, the metropolitan region, but we have yet to grasp that this unit, too, should have its corresponding image. Suzanne Langer sets the problem in her capsule definition of architecture:

"It is the total environment made visible."⁴²