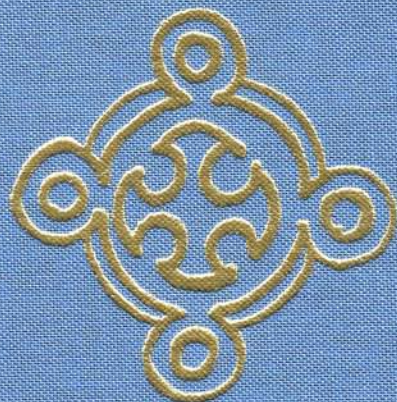


BOOK ONE



What is living structure?

What is life in buildings?

What is a living world?

What is the structure of a living world?

CHAPTER ONE

THE PHENOMENON
OF LIFE



1 / INTRODUCTION

It is widely agreed today that we want to build towns and buildings which play their proper role in the preservation and continuation of life on earth. This has come about, in large part, as a result of the growing interest in ecology. When we study ecology, we begin with the idea that we must preserve nature, preserve the rain forest and chaparral, preserve the animals and plants of the earth. This general desire to preserve living things is then extended to tell us that we should build buildings and towns and neighborhoods, in such a way that their action also plays its role in the balanced harmony and life of the earth.

At first the effort to make buildings play their proper part in the living system of nature was seen as a narrow problem, which meant that one's use of energy, use of materials, use of resources, should all be consistent with the preservation of the earth as a balanced living system. More recently this interest has expanded. Many people now define their aim to be the creation of towns and buildings which are part of the living fabric of the earth and which are themselves, in short, alive.¹

But here, suddenly, we find ourselves up against a very unusual scientific problem. Within biological sciences as they stand at the end of the 20th century, we do not have a useful, or precise, or adequate definition of "life." In traditional 20th-century scientific orthodoxy, life — or, to be more precise, a living system — has been defined as a special kind of mechanism. The word "life" has been applied only to a certain limited system of phenomena. We shall see, in this book, that this conception of things needs to be changed. "Order" may be understood as a most general system of mathematical structures that arises because of the nature of space. And "life," too, is a concept of comparable generality. Indeed, in the scheme of things I shall describe, every form of "order" has some degree of "life."

Thus life is not a limited mechanical concept

which applies to self-reproducing biological machines. It is a quality which inheres in space itself, and applies to every brick, every stone, every person, every physical structure of any kind at all, that appears in space. Each thing has its life.

The need for a broader view of life comes about, in a simple way, from the ecological viewpoint. Nowadays many people have begun to recognize the importance of animals, plants, and living systems to the earth; and have begun to seek a view of architecture and city planning which is consistent with the maintenance of life. So far this has been fairly intuitive. It has meant that, in addition to buildings, architects want to create systems of trees and plants which sustain themselves: systems of building that are wholesome with respect to nature, coordinated with natural processes, not damaging to the great forests of the Amazon, not damaging to the birds and butterflies in the backyard. For several decades architects and lay people have understood this form of architecture as something desirable.

But we need to push the ecological idea further. What it needs — what it already has, as a seed within it — is a conception of life which goes beyond the narrow mechanistic biological view of life, and somehow embraces all things.

This arises from the desire to take *everything* as a single system and to make it whole. If we want to take an ecological view of architecture, we naturally try to take the view that our job on earth is to create life in buildings and in towns, not only in the "wild" part of nature. This is quite different from merely preserving the natural life which exists. It means *creating* life in man-made things and natural things *together*.

Southern England, for example, is one of the largest structures ever made by man. We think of it as nature: the beautiful expanse of towns, villages, fields, forests and moors that

extends from Cornwall to Kent, and from the south coast to the Midlands. We think of it as natural, but of course it is man-made, almost all of it. It wasn't there three thousand years ago. It is a consciously created structure, perhaps 300 miles by 100 miles, and it has been created slowly, patiently, over a period of about a thousand years. The fields, ditches, copses, hedges, streets, cow-paths, streams, ponds, bridges, and villages are something which includes nature, which has the same life that we attribute to nature. But it was made by man.

This active creation of a non-natural structure which clearly has life, and which is alive, is very much more than merely preserving nature. It is much harder, to begin with, because it has to be invented; it is not a case of merely smiling at nature and saying, "Let's keep it that way." The fact that it is even possible poses enormous intellectual difficulties. In order to understand it, grasp it mentally, and to do

it, we must have a conception of things in which the relation between living tissue, in the narrow biological sense, and non-living matter (again, non-living in the narrow biological sense), can be made clear and understood. We must not only want the bush to be alive with respect to birds, earth, rain, and so on, but we must also understand how the piece of wood in the windowsill, the piece of concrete in the edge of the flower bed fit into this pattern of life and complete it. Thus we are after *one* pattern of life, which includes the so-called living organisms and the so-called dead matter in a single living system. It is a case of understanding the interaction of man and nature, and making a harmony out of that interaction, which has the beauty of nature and the zest of life. The making of such a structure has been done repeatedly in different cultures during different ages: the Japanese house and garden, the terraced hillsides in



*Colored-pencil sketch of the Sussex Downs.
The countryside where I grew up in southern England.*

China and the Himalayas, the building of Machu Picchu, the creation of the medieval landscape, the relation of the Cheyenne Indians to the plains where they placed their tepees.

These cases are excellent models for us as we struggle both with ecological catastrophes and a man-made world which is ugly, aggressive, and non-life-supporting.



2 / THE NEED FOR A BROADER AND MORE ADEQUATE DEFINITION OF LIFE

So far we do not have a definition of life which clearly applies to these larger and more complex systems. In the 20th-century scientific conception, what we meant by life was defined chiefly by the life of an individual organism. We consider as an organism any carbon-oxygen-hydrogen-nitrogen system which is capable of reproducing itself, healing itself, and remaining stable for some particular lifetime. This definition is not so easy to pin down perfectly. There are plenty of uncomfortable boundary problems: For example, is a fertilized egg alive during its first few minutes? Is a virus alive? Is a forest alive (as a whole, and over and above the life of the component species taken as individuals)? Are carbon, hydrogen, oxygen, nitrogen necessary to what we shall define as life?

Even though riddled with logical holes and awkward questions, still in broad terms it is the life of the individual organism which gives us the basis of what we consider alive, and what we define as "life," in the late 20th century. We have, it is true, begun some extrapolations of this idea of life, and have started trying to apply them to more complex systems. For example, we have somehow managed to extend the mechanical concept of life to cover ecological systems (even though strictly speaking an ecological system is not alive, because it does not meet the definition of a self-replicating organism). We consider an ecological system as a system of organisms, and therefore, though not alive itself, certainly associated with biological life. The task of creating or conserving the natural world can therefore be understood, in precise terms, as

an effort to increase the organic life in a particular part of the world, and this has partially reasonable scientific meaning.

But this extrapolation will not do to help us understand truly complex systems as living things. The mixture of natural and man-made which exists in any city or any building — or in the huge 300-mile-long structure of southern England — raises complicated questions of definition, which we have hardly begun to answer. In all these cases we have obviously *non*-living systems mixed in with the living systems: for example, the rafters of a house, the roof tiles, the road, the bridge, the gate; even the furrows in the field. In normal scientific parlance, one could not possibly call these things alive. And yet clearly they do have a vital role in the overall life of the larger systems. If we adhere to the purely mechanistic picture of life, we are stuck with preservationist adherence to ecological nature in its purest form — just as ecological purists have in fact been stuck with the idea that they must keep nature "as it is," because this is the only way they can define clearly what they want to do. The moment we want to treat the more complex system of buildings and nature together, as one living system, we run into intellectual problems because we no longer have an adequate scientific definition of what we are trying to do. For example, according to present-day biological terminology, *a city is not a living system*, even though it is often referred to as a living system by social scientists in search of a metaphor. Obviously, too, a building is not a living system. How can we try to make a living system out of a region, or a city, or a build-

ing — even out of a garden — when, according to current scientific orthodoxy, these things are not living systems?

Throughout this book, I shall be looking for a broad conception of life, in which each thing — regardless of what it is — has some degree of life.² Each stone, rafter, and piece of concrete has *some* degree of life. The particular degree of life which occurs in organisms will then be seen as merely a special case of a broader conception of life. Although this may sound absurd to ears trained in the last few decades of scientific orthodoxy, I shall try to show that this conception is more profound scientifically, that it has a solid basis in mathematical and physical understanding of space, and above all that it does provide us with a single coherent conception of the world, and of what we are doing in the world, when we try to make the world “alive.”

In the present scientific world-view, a scientist would not be willing to consider a wave breaking on the shore as a living system. If I say to her that this breaking wave does have some life, the biologist will admonish me and say, “I suppose you mean that the wave contains many micro-organisms, and perhaps a couple of crabs, and that therefore it is a living system.” But that is not what I mean at all. What I mean is that the wave *itself* — the system which in present-day science we have considered as a purely mechanical hydrodynamical system of moving water — *has some degree of life*. And what I mean, in general, is that every single part of the matter-space continuum has life in some degree, with some parts having very much less, and others having very much more.

It is not hard to see that such a conception — if we could get it — would make it much



A breaking wave

easier to design buildings, towns, and regions. If the conception of life is completely general, we shall then be able to extend it from the purely natural (such as conservation of a beautiful stand of trees), to the cooperation between natural and man-made (roads, streets, gardens, fields), and then also to the buildings themselves (roofs,

walls, windows, rooms). In such a mental world, it will become easy to make sense of architecture — because we can then simply proceed with the general idea that all our work has to do with the creation of life and that the task, in any particular project, is to make the building come to life as much as possible.



3 / A NEW CONCEPT OF "LIFE"

My aim in this book is to create a scientific view of the world in which this concept — the idea that everything has its degree of life — is well-defined.³ We can then ask very precise questions about what must be done to *create* life in the world — whether in a single room, even in a doorknob, or in a neighborhood, or in a vast region, where, as the English people of southern England did once long ago, we might again create life in large parts of California, or Asia, or indeed in any region of the world.

As a background for our work, I shall in this first chapter simply try to persuade you, by example, that we do *feel* that there are different degrees of life in things — and that this feeling is rather strongly shared by almost everyone.

Let us first consider the breaking wave. When we see waves in the sea, we do certainly *feel* that they have a kind of life. We feel their life as a real thing, they move us. Of course, in the narrow mechanistic view of biology there is no life in the wave (except insofar as it has seaweed or plankton living in it). But it is undeniable — at least as far as our *feeling* is concerned — that such a moving, breaking wave feels as if it has more life as a system of water than an industrial pool stinking with chemicals. So does the ripple on a tranquil pond.

It is also clear that one lake feels more alive than another — a clear crystal mountain lake, for instance, compared with a stagnant pond which feels more dead. A fire, which is not organically alive, *feels* alive. And a blazing bonfire

may feel more alive than a smoldering ember. The moons of Jupiter, if you have ever seen them through a telescope, feel alive, like four liquid droplets of light. They feel alive to an uncanny degree. Yet, in conventional terms they are not.

Gold feels alive. The peculiar yellow color of naturally occurring gold, so different from pyrites, or from the gold in the jeweller's shop, has an eerie magic essence that *feels* alive. This is not because of its monetary value. It got its monetary value originally *because* it had this profound feeling attached to it. Naturally occurring platinum, comparable in value, or rhodium, which is far more valuable, do not have the same feeling of life at all.

Marble, too, sometimes feels alive. The quarries at Carrara, in Italy, are famous because the marble from that place feels intensely alive. Another marble may feel more ornate but less alive. Artificial marble — polymerized stone dust — as it might appear in a bathroom counter in Las Vegas, feels much less alive. Yet none of the three is actually alive, biologically.

We often see a piece of wood and marvel at its life; another piece of wood feels more dead. Of course, you may say that the wood was once alive. But again, in the exact biological sense, it is certainly not alive now. Yet we do feel that the grain of one piece has more life than another.

Thus, throughout the world of non-organic physical systems, we make distinctions. We recognize cases which seem to have a great deal of life, others which seem to have none, others in

between. The intuition, or impression, of life exists in a wide variety of physical systems.

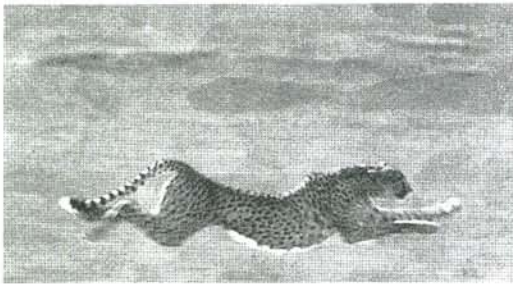
We shall see later that this feeling that there is more life in one case than the other is correlated with a structural difference in the things themselves — a difference which can be made precise, and measured. But for now, I merely want to record the intuition that some different physical systems appear to have more feeling of

life and others less feeling of life. Obviously this does not prove that this intuition is anything more than a subjective perception. But it does at least open the door a crack, to the possibility that there *might* be some kind of real structural phenomenon behind the feeling. All I hope to do, so far, is to encourage the reader to begin thinking that this *might* not be merely a metaphor, or an anthropocentric view.



4 / THE FEELING OF LIFE IN ORGANISMS

When we compare different organisms we *feel* that some things have more life than others — even though, technically, they all have equal degrees of life.⁴ Here is a picture of a leaping cheetah. We do not need to be reminded that this animal is alive. This cheetah feels *intensely* alive, not just alive.



A cheetah in the glory of its life

The same can happen in a meadow of flowers. Sometimes the flowers themselves have a poignancy — a lily of the valley in a misty meadow — and radiate an intense life.

We may feel the same in a person. One person may be glowing with life, which transmits to everyone around. Another person is drooping, half dead. We experience the sensation that one is more alive, and feel degrees of life in different people — even in the same person at different moments. And there are, of course, cases where a person's actual health is different. One is radiantly healthy, another less so. In this case, there may be a medical counterpart to this sensation of more life. But in any case, what is undeniable is that different organisms, all alive in the strictly mechanical sense, impress us as having more life or less life.



5 / THE FEELING OF LIFE IN ECOLOGICAL SYSTEMS

Let us go next to our most widespread experience of life — the larger life that exists in nature all around us. This is the larger “ecological” life which occurs in every natural ecosystem. It includes the well-being of a vast array of natural organisms — plants, animals, parasites, fish — which occur in and around a building. Fish-ponds, climbing

flowers, grass, mosses on the building, shade trees in the courtyards, cats, dogs, mice, insects, and spiders. In all these cases we feel the life intensely. Indeed, it is this feeling of life and love of nature which stimulated the young discipline of ecology.

On the following pages, there are two forest scenes. We see a wild profusion of organisms.



New England pond

Their life is the familiar life we recognize in nature, in plants and animals, and in ourselves. Yet, as I have said earlier, there is no simple definition of life in an ecological system. Within the narrow biological definition of a living system as an organism, an ecological system as a whole is not

alive. But in any case, we still experience its life. And we recognize *degrees* of life, or degrees of health, in different ecological systems. In recent years, we have begun to formulate technical descriptions of these ecologies which allow us to distinguish one as healthier than another.



Woods in summer

In any case, beyond the gradual emergence of precise formulations in ecology, we do have the feeling that one meadow is more alive than another, one stream more alive than another, one forest more tranquil, more vigorous, more alive, than another dying forest.

Here again — almost regardless of what ecologists have managed, or not managed, to formulate — we *experience* degree of life as an essential concept which goes to the heart of our feelings about the natural world, and which nourishes us fundamentally, as a *fact* about the world.



6 / LIFE IN ORDINARY HUMAN EVENTS

*Matisse and his birds*

We certainly feel different degrees of life in different human events. Consider first almost any social act. Look at the simple act of shaking hands. In one case it feels full of life; in another case, mechanical, dead.

Look at your favorite bar: a place which comes to life at night, where some special life exists, seedy, raucous. The bar. The night club. A fish-pond there. A garden seat. Shaking hands. A night at the ballet.

The "life" which I am talking about also includes the living essence of ordinary events in our everyday worlds — the fact that a back-street Japanese restaurant has life in the ordinary sense; the fact that an Italian town square comes to life in

the ordinary sense; the life of an amusement park like Coney Island; the life of a bunch of cushions thrown into a corner window-seat — any building where we feel alive; a place where wildflowers grow comfortably; a place where people are free to talk and eat and drink and be themselves. I have described this very ordinary but intensely living quality of buildings and places in the first few chapters of *THE TIMELESS WAY OF BUILDING*.⁵ This quality includes an overall sense of functional liberation and free inner spirit. It makes us feel comfortable. Above all it makes us feel alive when we experience it. I add pictures of a few examples here, so that we have an image in mind of what this "ordinary" life is all about, both what it

THE PHENOMENON OF LIFE



Japanese restaurant, San Francisco



Jazz in the street



A secret smoke

really means and what it looks like, as a structure, when it occurs. Like biological life, it has a typical appearance. It is rather rough, not manicured. It is comfortable, rough around the edges, smooth as if it has been rubbed together. This kind of life is the ordinary life which is not connected to high art or fashion. It has nothing to do with images. It occurs most deeply when things are simply going well, when we are having a good time, or when we are experiencing joy or sorrow — when we experience the real.

The freedom which arises when life is at its most spiritual, and also most ordinary, arises just when we are “drunk in God,” as the Sufis say —

most blithe and most unfettered. Under these circumstances, we are free of our concepts, able to react directly to the circumstance we encounter, and least constrained by affectations, concepts, and ideas. This is the central teaching of Zen and all mystical religions.⁶ It is also the condition in which we are able to *see* the wholeness which exists around us, feel it directly, and respond to it. The association with bars is not entirely silly. Drunkenness, no doubt evil itself at times, also releases our ability to see the truth more clearly. The Romans said *in vino veritas*. When we have some loss of inhibition, our freedom to act and react is often truly increased.



May Day parade, Beijing



7 / THE FEELING OF LIFE IN TRADITIONAL BUILDINGS AND WORKS OF ART

The feeling that some things live more intensely than others certainly exists in buildings, in artifacts, and in works of art. To give the reader an idea of what I mean by “the intense feeling of life” in material things, I now present a sequence of pictures which show some intense examples of this kind of life in things.

The first thing is a prehistoric Minoan vase, complex in shape and very basic, so that it hits you in the belly with its shape and with its color. The next thing, a Danish courtyard painted in yellow, red, and green, is simple and childish—but quiet and profound. The life fills you. The great mosque in Isfahan, dazzling in its color, is more magnificent. In its size, and color, it has an awe-inspiring life, somber in its reminders but, unlike a Gothic church,

bright and joyful. In contrast, a tiny Korean ceramic stand for a teapot is simple, beautifully shaped, without complication, but full in its being. Green and yellow tiles from a mosque are unconcerned, hand painted, repeating but not repeating, harmonious in their similarity, unworried in their inventiveness. A stone column capital, carved by Romanesque masons, is reused in a North African mosque. The capital is like a flower or like a person, quiet, solemn, happy. A famous Turkish prayer rug from the 15th century, now in the Berlin Museum, dazzles in the intensity of red, created by the lines, S-shapes, and by the unusual soul-like character of the prayer arch.

An archway in India: dark shadow, bright light, cool, and soul-like, the careful shaping of



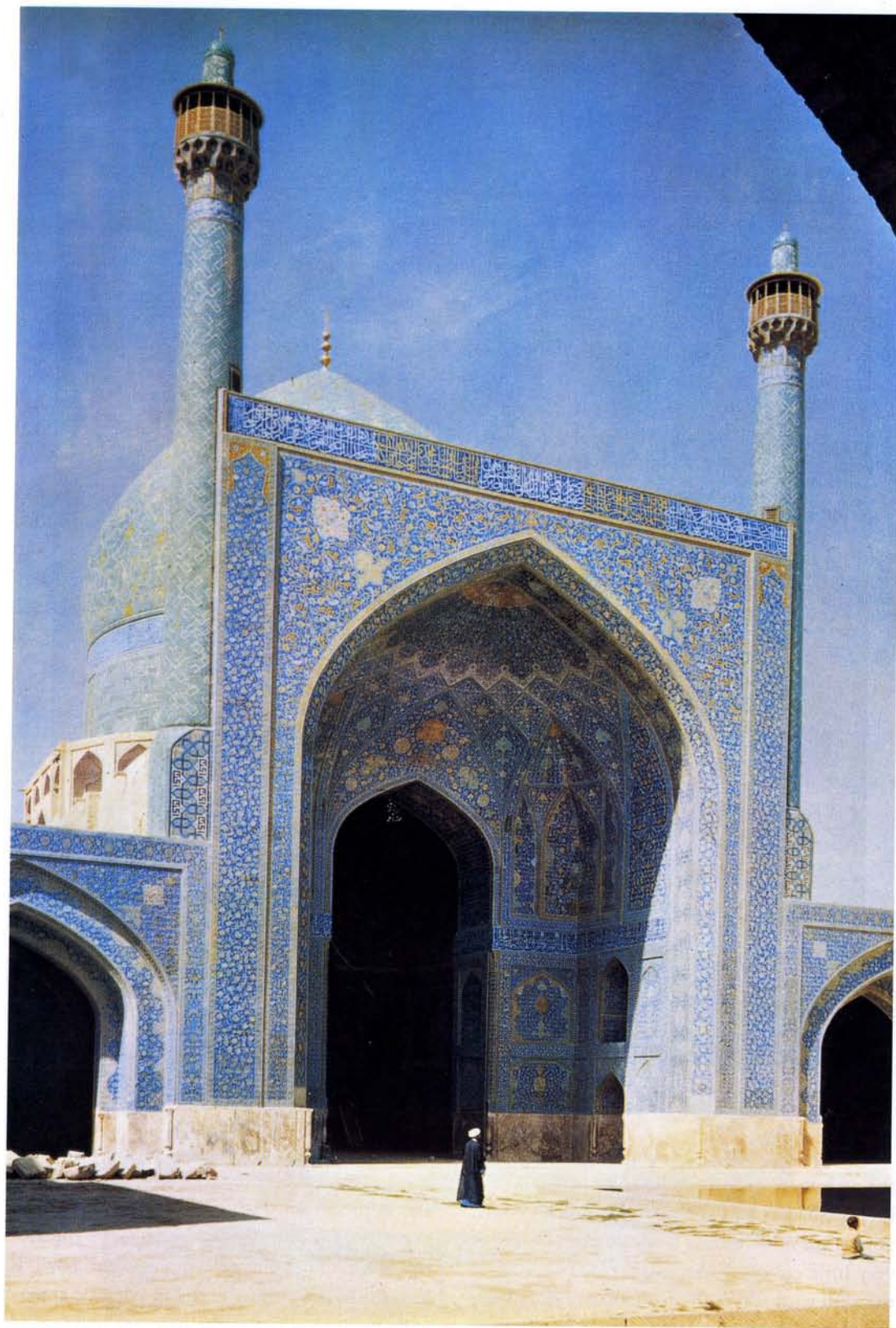
Minoan vase, 18th-century B.C.



Courtyard of a house in Copenhagen

the arch made so that its lobes bring life to the intense shadow and hot sunlight. A page from a 7th-century manuscript is absolutely quiet, with very little color, yet the color shines because of the skill with which the painter used it. A little yellow and brown on white produces an eerie inner light. Extreme feeling appears in a small

hand-carved and painted madonna. It is small and unpretentious, yet more intense in its feeling than perhaps all the paintings of the Renaissance. The surface of a Persian bowl is brought to life by small black fly shapes, apparently painted as fast as the painter's hand could move over the surface of the inside. Another



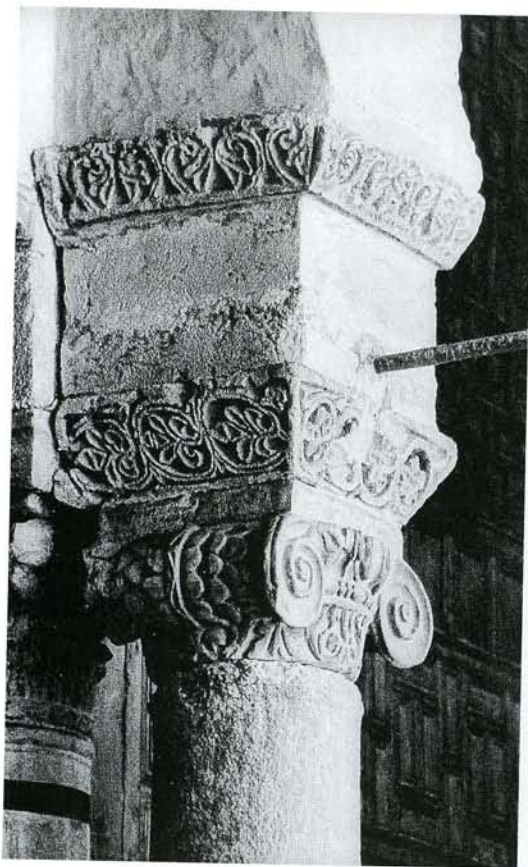
The Masdi-i-Shah, Isfahan



Hand-painted tiles from the mosque of Kairouan, Tunisia



Korean teapot stand



A Romanesque column capital

bowl, startling in its roughness and simplicity, is the great Kizaemon tea-bowl, made in Korea, now treasured in Japan.

In every one of these examples we experience an intense feeling of life.⁷ We experience it in the objects themselves and in their parts. And, in keeping with the idea of order, the life we experience seems very much to lie in the geometry, in the actual geometrical arrangement of the thing.

Although we may not be able to define it exactly, I suspect that many people will agree that they see something like life in all these examples. I do not expect that we shall have perfect agreement about the examples. Still, we probably have something close to agreement.

Similarly, if we ask people for a list of the "great" buildings of the world, certain buildings will probably be mentioned: the Parthenon,

Notre Dame or Chartres, the great mosque at Isfahan, perhaps the Alhambra, perhaps the Ise shrine or one of the earliest Buddhist temples in Japan, like Tofuku-ji. The very existence of this list suggests the measure of agreement which lies behind it.

And this agreement about life in things extends to lesser examples. The early Christian churches in Rome, the Norwegian stave churches, the mosque at Kairouan, the ruins at Palenque or Ixtlan, Machu Picchu in Peru, the long huts of the Sepik river people in New Guinea, the small tiled houses of Morocco, the great barn houses of northern Germany and Denmark, the arcades of Bologna, the bridge at Isfahan.

In only slightly lesser measure than the most famous examples, these, too, while less



15th-century prayer carpet, Ushak, Anatolia, now in the Berlin Museum



Arch in India

imposing, have an ability to touch us, to make us feel still, awed when we are in them, silent, grateful. There is not much doubt about their greatness. And people will generally agree that all these things have life in them — in some degree — though, again, just what this life *is*, or how it might be defined, perhaps remains unclear.

The quality I call life in these buildings exists as a quality. It is clearly not the same as the biological life we recognize in organisms. It is a larger idea, and a more general one. Indeed, what we intuitively feel as “life” in these objects happens just as much in a purely abstract thing like a painting as it does in a functioning thing like a building, or in a biologically living system like a tree.⁷



7th-century Christian illuminated manuscript: *The Durham Gospel fragment*.

It is this very general life — formal, geometric, structural, social, biological, and holistic — which is my main target. It includes the profound life of the geometric structure that we have seen in historical examples (their plaster, concrete and tile, the life of their colors and

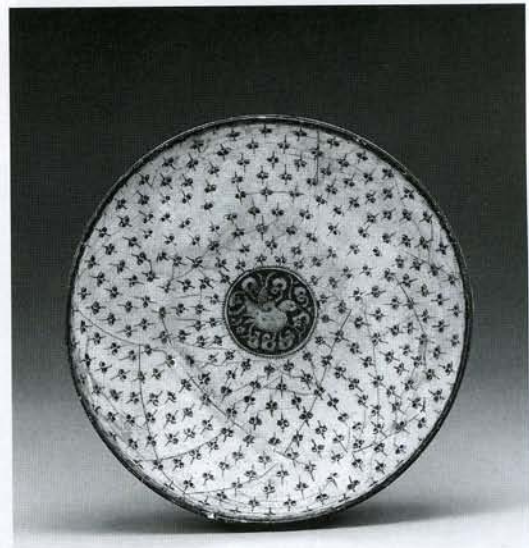
shapes). It includes the ordinary life, the actions and events which make us feel alive there, and which allow a happy everyday life to exist for the people and animals and plants who live there. And it includes the biological life, the nurture of the natural systems which exist in and among



The Kizaemon tea bowl, Korea, 16th century



12th-century Catalan Madonna, painted wood



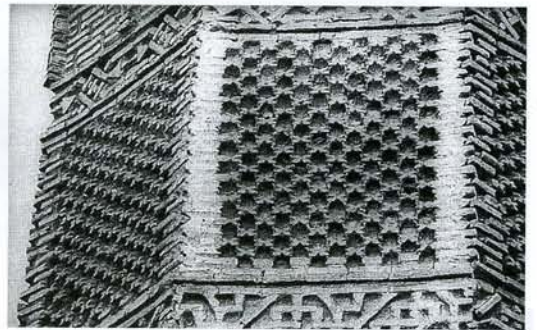
Black and white bowl, Persia, 13th century



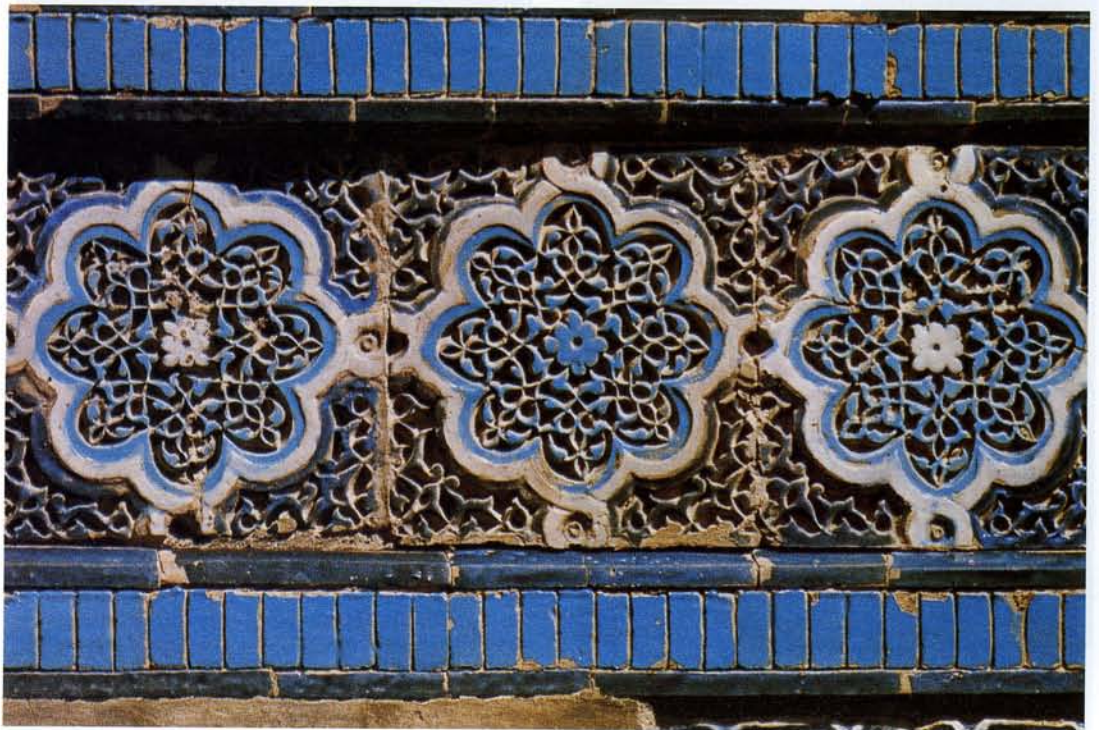
Norwegian women wearing traditional dress



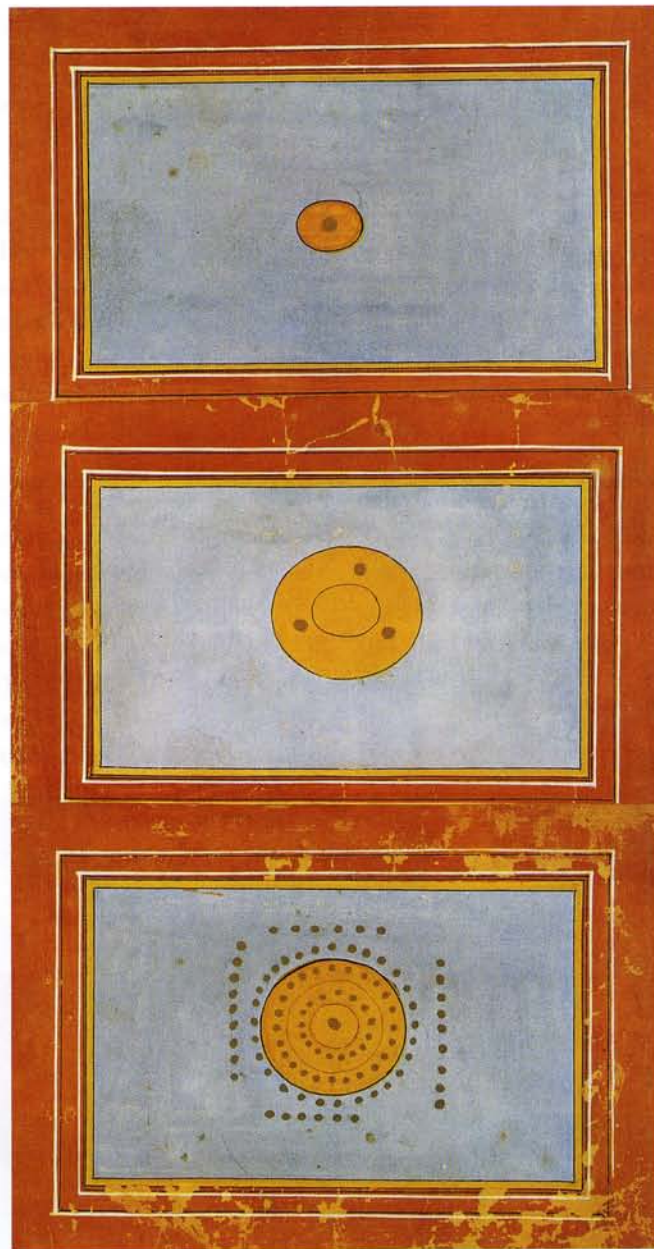
Stone granaries, Spain



14th-century brickwork, Afghanistan



Tilework on Shad-i-Mulk Aka mausoleum, Samarkand, 14th century



Tantric painting, India, 18th century

the buildings, so that they are biologically healthy. In a few cases, life in a thing, or in a person, or in an action, or in a building, reaches a level of intensity which is truly remarkable. This can happen in a work of art, or in a person's life, or in a moment of a day.

Above all, it does sometimes happen in buildings and in artifacts. It is this melted unity, this deepest experience of order that we experience with wonder, which is the real target of this book, since it is this quality which we are most often trying to reach when we make a building.



8 / LIFE IN TWENTIETH CENTURY BUILDINGS AND WORKS OF ART

The feeling of deep life which occurs in traditional artifacts is less common in the 20th century — especially in buildings. It is uncommon because — for reasons which will become clear throughout Book 2, *THE PROCESS OF CREATING LIFE* — the processes needed to create life were damaged in the 20th century.

Nevertheless, in modest degree the feeling of greater life does appear from time to time, and did appear, of course, in millions of cases during the 20th century. In the next few pages I have collected a few examples of buildings, places, and things from recent times which are ordinary enough, or profound enough, to feel alive in some degree.

In part, these examples feel alive because they are — as far as possible — concept-free.

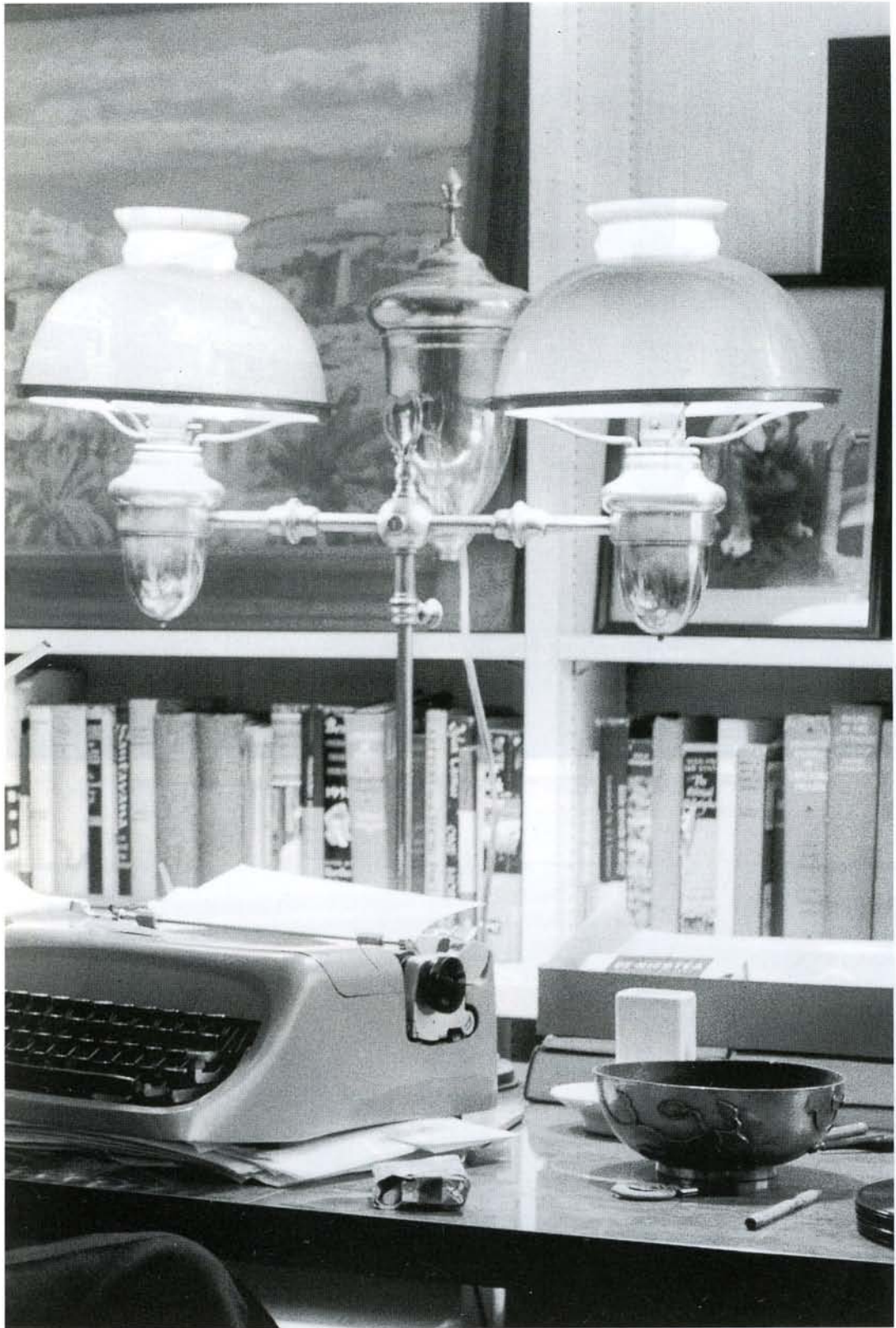
They are not based on images, or on *ideas* of reality, but instead they have reality *itself* coming to life in them in a free way. They are vigorous and straightforward, where the soul of the maker has entered the thing — or where the ordinary process of daily life, uncontaminated by ideas or notions of what to do, has unfolded in a way that we accept very easily.

These things make us comfortable, because we recognize them as genuine. The life we feel in them comes from this genuineness. *Since it is our main intention to make things which feel alive in our own time*, it is these modern versions which must especially inspire us. They are the springboard from which our own efforts must come. Our own effort to form life in our time, because it must be consistent with 20th-century



The Funeral of the Clown, from Jazz, Henri Matisse

THE PHENOMENON OF LIFE



Tennessee Williams's study



20th-century apartment house, Athens



The Imperial Hotel, Tokyo, Frank Lloyd Wright



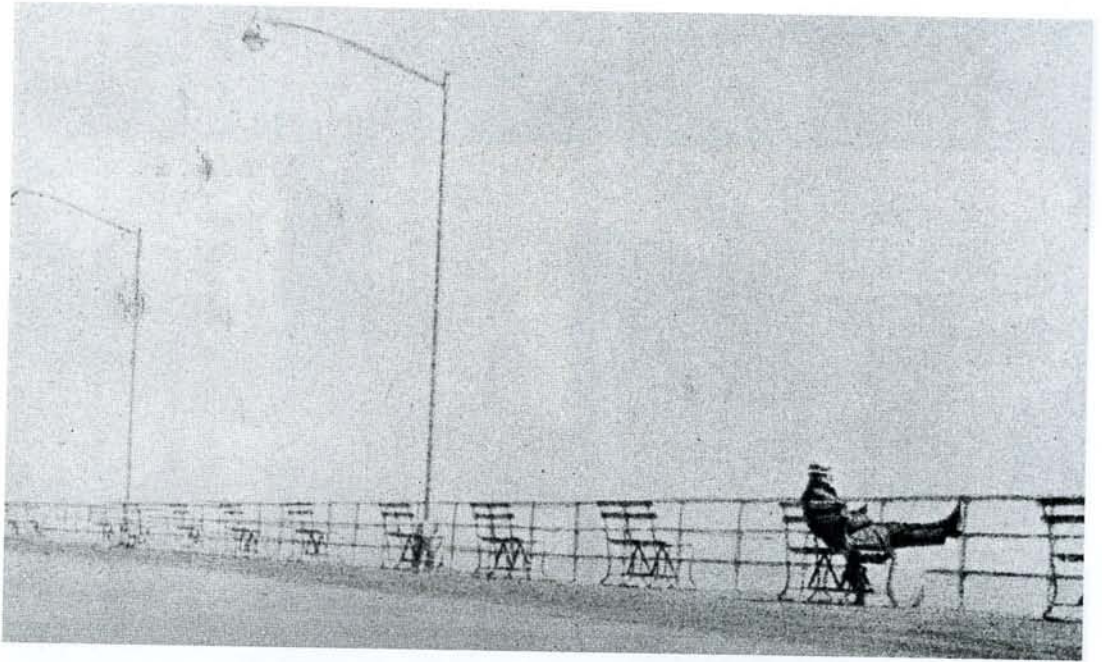
Neapolitan boats



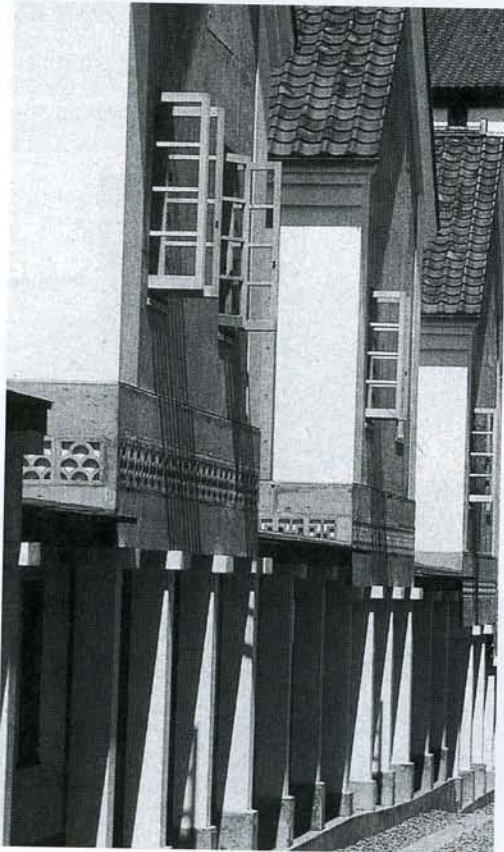
Manhattan Bridge, New York City



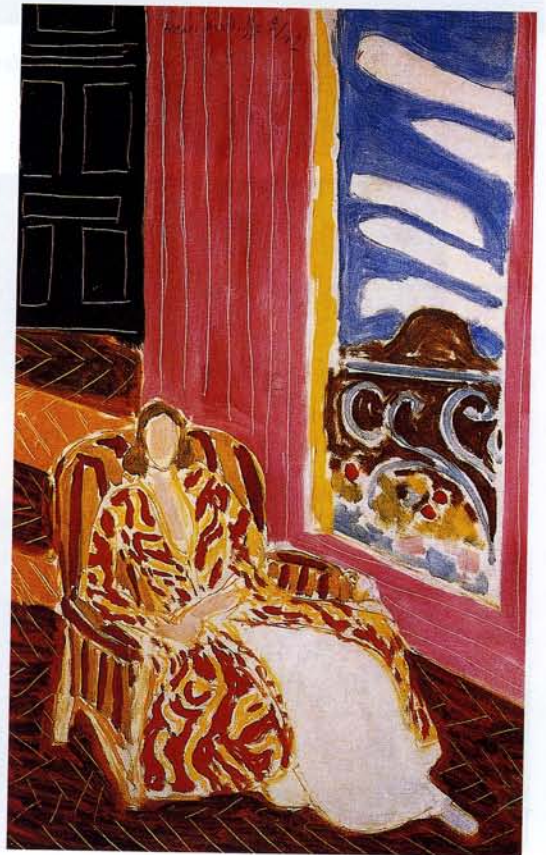
Parahi te Marae, The Sacred Mountain, Paul Gauguin



The ocean front, Atlantic City, New Jersey



Classrooms on the Eishin campus, near Tokyo, Japan

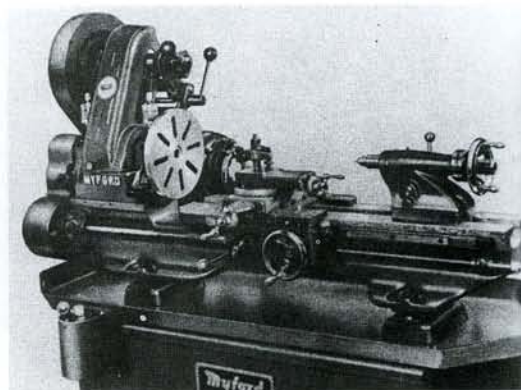


The Black Door, Henri Matisse

life as we now find it, and as we have now created it, is the most inspiring thing of all, and our chief target.

To produce this life, we must first see how life springs from wholeness, and indeed how life *is* wholeness. Wholeness exists all around us, and life springs from it. Every situation we are in, even the most mundane, has the capacity for life in it.

Comfortable ordinariness and lack of "image" quality are the main things which produce life in our current situation. A man in his shirt-sleeves, a cafe which is a converted gas station, paving which is made to last a long time but also



20th-century steel-working lathe



Under the elevated tracks, Brooklyn, New York



La Scala, Milan



Blossoming Almond Tree, Vincent Van Gogh. Painted just before the onset of the 20th century, this is still a modern work.

to honor small plants without being precious, machines in a workshop, the decoration on a giant trucking rig, a hammock which is not too new, a photograph pinned to the wall above a person's desk, paint on part of a shop window, the festive quality of a big tent with a dance for a thousand people, the loading dock of a warehouse where two people are eating a sandwich

during their lunch break in the sun. These are ordinary things which make life, even in the present environment. What we need to understand, is that this comfortable ordinariness in its thousands of manifestations, as well as the high points of modern art, are all produced by the same structure — and that, when it succeeds, this structure is “life.”



9 / INTENSE LIFE IN ORDINARY POVERTY

Some of the artifacts I have shown in this chapter are very beautiful. It might be said that these things are too special, that they come from a small and privileged class of human artifacts, and that they are not representative of the vast majority of human experiences throughout the centuries of history.

But the quality of life is not precious or "high" in this sense at all. It exists also, quite easily, in the most humble and ordinary aspects of our daily lives. In this sense the great life we feel in works by Matisse and van Gogh is somewhat misleading—since the same feeling of life can occur, also, in a dirty hut or in a slum—and, indeed, is often more likely to occur in such a place than in a work of "architecture."

This is confusing, because it seems contradictory. Yet it is fundamental. Misunderstanding of this point is responsible, almost more than anything else, for our failure to produce life in modern architecture.

It is for this reason that I now show a photograph from a slum in Bangkok. The poverty and dirt allows the life to exist, allows life to shine out, because the middle-class conceptions of what is good are not at work killing the life. The conditions are so impoverished that only the direct life itself exists. Mental conceptions of what is desirable inspired by magazines, images of desire fostered by the media, here have gone out the window, or never existed.

The reader may think that I am romanticizing poverty. What about the Middle Ages, for example, with hunger, disease, and fearful human prejudice? They somehow produced better buildings than we do, at least in their cathedrals. But what about the hovels in which serfs were forced to live. Did these have life?

Yes. The answer is yes.

Of course, the disease and ignorance of these past periods are horrifying. There is nothing very lively about leprosy and starvation, which I have witnessed even in this century in an



This slum in Bangkok has life, real life.



Inside the Bangkok house

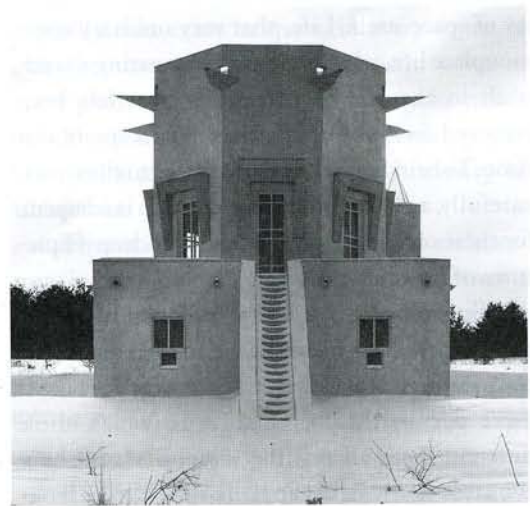
Indian village where I lived, or in the slums of Lima.

But in the midst of all that poverty, even the shacks where people live had some direct and human quality, quite different from our own experience in a plastic tract house, or in a motel, or in a McDonald's hamburger joint. Compare the pretentious plastic-fantastic postmodern "house" on this page. It is a horrible deathly thing. Under normal circumstances this would not even be worth commenting on. But things have become so topsy-turvy in our world that this building is considered a valid work of architecture, worthy of being illustrated in architectural magazines, while the slum above is considered something terrible.

Of course it is true that the postmodern building is clean, not disease-ridden; and the people who live there probably have their health and three square meals a day. It is also true that the people who live in the Bangkok slum may have a shorter life span and may be starving. Still, even when one takes these facts into account, the place in Bangkok and the people there

perhaps have more life: while the postmodern house with its image-ridden knobs and ears perhaps has little to do with life, little to do with any deep reality.

In the slum, in some way, the direct voice of the heart is there. It is there in the mud hut of an



*Postmodern house in the United States:
West Stockbridge, Mass.*

Indian villager, even now. It can be there even in the miserable poverty of a slum tenement in Lima. It is life, the force of direct human experience, misery, compassion, ignorance, and warmth all mixed up together. There is an honest life there. It really is *life*.

In the McDonald's hamburger stand of our own experience, or in the pretentious postmodern house, or in the perfect plumbing and fitted carpets of a tract house or a Tokyo apartment, we

may have comfort, we may have overcome disease and found material warmth and wealth — but the direct message of the heart is often less there.

In this sense, not only the great monuments of the past, but even the hovels of the Middle Ages, even the sagging doorpost of a Tibetan village house, all have a direct contact with life, and a closeness to our own hearts, which is less present in the our environment today.⁸



10 / THE TASK OF MAKING ORDINARY LIFE IN THINGS

Let us come back now to my ordinary and commonplace effort. I want it to be possible for us — all of us — to make buildings, benches, windows, which have that simple comfort in them, so that everyone feels at home, so that they support us in our daily life.

But it turns out that this life-supporting quality, simple as it is, is also elusive. It is largely missing from the 20th century, for a variety of complex reasons. It is missing above all because some deep conceptions of matter — at first almost remote, and apparently not common-sense or practical at all — have been removed from our awareness. First among these concepts of matter is the most fundamental one — that life is a quality of space itself. Life, that very ordinary commonplace life, which we experience eating a sandwich in the sun, is something that has been removed from the intellectual landscape of our time. To bring it back again, we have to construct, carefully, a picture of the world which is adequate for these ordinary — but immensely deep — pictures of how things are.

Superficially, the many examples of life in this chapter look dissimilar. Each belongs to its own time and place. But if we examine them more deeply, there is a sense in which these different cases all *look* the same. They all have the same deep quality in their appearance; looking with the right eyes, one sees the same structure, again and again, in all of them.

One aspect of this structure is the “wabi-to-sabi” of Zen teaching: the Japanese concept of beauty which is best translated as “rusty beauty.” These things are all beautiful, but they are all damaged. Life itself is damaged, and nothing which is perfect can be truly alive. There is a rough amiable quality in the Japanese restaurant, in the bench and the solitary watcher at Atlantic City, in the houses of the Bangkok slums, even in the blossoms of van Gogh's almond tree. This quality, the real life, the deep life of all great art, and of all genuine experience, is our aim.

The astonishing thing is that every time this *very* deep life shows its face, it looks the same. It looks the same in the weather-beaten face of an old man sitting by the river, it is the same in the hastily and carefully made picnic that Cartier Bresson photographed, it is the same in the quality of an ordinary natural river, it is the same in the moss along the river bank, it is the same in the loose rough repetition of boards along the side of a traditional Pennsylvania barn.

It is even the same in the very great craft and subtlety of the great Isfahan mosque and its tile-work, where the outward perfection again hides the drunkenness, the careless abandon in the individual bits of tilework that allowed the artist, drunk in self, to make a free thing in the flowers he put in the glaze.

What impresses us about all these examples is that they have a kind of blitheness or serenity,



Picnic by the River, Henri Cartier-Bresson

an innocent and simple quality. Their depth is not a mechanical composition: there is a truth, an easiness, about many of these things. Their easiness takes the breath away. They arrive at a simplicity and truthfulness which ring an echo in us — sometimes perhaps even make us weak in the knees. Somehow these works remind us of the essence of life. They have a simplicity beyond artifice.⁹

The quality of life includes us, as human beings. A place which has the deepest life is one in which I reach a deeper level of life inside my self, and in my spirit. The quality of life which I attain — its depth — in any given building is part of the way I experience that building.

And it goes further. This quality of life is a pervasive one. It includes the ordinary biological life, which we usually forget when we try to judge buildings, but it also includes a kind of “life” which happens, to a lesser or a greater degree, in

the very stones, concrete, and wood posts of which the building is made. Thus it is a kind of life which is profound in a painting of apple blossoms by van Gogh, less profound in an advertising poster. It is a quality that exists in space, in every stone, in every brush-stroke, just as much as it occurs in every plant and insect, and in the ducks which walk about in my own garden in the densely populated hills of Berkeley near the University of California.

Thus it is a conception of life and architecture in which the house I live in becomes a greater thing because of the ducks in the garden — and it is a conception in which the beautiful shape of a window not only gives more life to the window, but also enlarges the window and the house.

It is, also, a conception in which my own spirit, and the spirit of each of us, is enlarged to the extent that the spirit *itself* has this greater

life in it — and in which the greater spirit which I reach, in my life, is inextricably connected to the presence of that life in the sticks and stones from which the building and the rooms are made.

In what follows, I hope to show that this deep and even holy conception of our lives, and of the life of our surroundings, turns out

to be directly and practically connected to an identifiable structure. It is something which occurs in space. The deep order which produces life in buildings is a direct result of the physical and mathematical structure that occurs in space, something which is clear and definite, and something which can be described and understood.

NOTES

1. The points made in the first section became much more clear during a workshop which Sim Van der Ryn and I gave together at the Esalen Institute in 1991. I am very grateful to him and to the workshop members for an inspiring discussion.

2. Although such a conception does not yet exist in modern science, it does exist in traditional Buddhism, which in many sects treats the world in such a way that every single thing “has its life.” Many animistic religions too — for example, those of African tribes, or of the Australian aborigines — treat each part of the world as having its own life and its own spirit. The modern Western tradition does have a variety of half-scientific attempts — those works in the vitalist tradition, for example, by Goethe, Hans Driesch, and Henri Bergson’s *CREATIVE EVOLUTION* (New York: Henry Holt & Co., 1937). But these poetic accounts of the universal existence of life are not yet part of the stream of science, still not solid, structural good sense of a sort which allows us to share knowledge that holds up empirically. We do not so far have a scientific conception of this kind.

3. Theodore Roszak, *THE VOICE OF THE EARTH* (New York: Simon & Schuster, 1993) also describes the existence of life in all things as an emerging scientific idea.

4. According to today’s simplified definition of a self-replicating system.

5. Christopher Alexander, *THE TIMELESS WAY OF BUILDING* (New York: Oxford University Press, 1979), chapters 1 and 2.

6. See Aldous Huxley, *THE PERENNIAL PHILOSOPHY* (1945; New York: Meridian Paperbacks, 1962).

7. By 1970 a few writers had begun to comment on this quality which I have described, perhaps none more profoundly than the great Japanese potter Soetsu Yanagi, who explained his attitude in his book *THE UNKNOWN CRAFTSMAN: A JAPANESE INSIGHT INTO BEAUTY* (Tokyo: Kodansha International, 1972). Yanagi also founded the folk art museum of Tokyo, one of the first public institutions in modern times to honor these kinds of artifacts with proper respect. By now, this admiration and acceptance of traditional artifacts is far more widespread.

8. The fact that many examples in this chapter have a great and profound “life” may be confirmed, empirically, by simple experiments. Some of the key experiments, and variations of these experiments, are extensively described in chapters 8 and 9.

9. The general quality of life visible in these photographs (pp. 34–61) has been described by mystical writers in each of the great religious teachings. For example, by the sufis as “being drunk in God,” thus Umar Ibn al-Farid, *KHAMRIYYAH*, c. 1235, “We have drunk to the remembrance of the Beloved a wine wherewith we were made drunk before the vine was created.” A similar theme exists in Zen art and among early Zen teachers. Among modern Western writers Hubert Benoit is one of the few to get to grips with it; see especially Hubert Benoit, *THE SUPREME DOCTRINE* (New York: Viking Press, 1959), translated from the French *LA DOCTRINE SUPRÊME SELON LA PENSÉE ZEN* (Paris: Le Courrier du Livre, 1951); also idem, *LET GO* (New York: Samuel Weiser, 1973). All summarized in Aldous Huxley, *THE PERENNIAL PHILOSOPHY*. See also “The Quality Without a Name,” in Christopher Alexander, *THE TIMELESS WAY OF BUILDING*, chapter 2.

CHAPTER TWO

DEGREES OF LIFE





1 / DIFFERING DEGREES OF LIFE IN OUR EVERYDAY SURROUNDINGS

The quality I have identified in chapter 1, the general beyond-biological quality of life as an attribute of all material systems, exists, I believe, to varying degrees in every part of space. It exists, for instance, in the ink and paper of the period at the end of this sentence, and it exists in the ink and paper of the letter q printed here. Of course it exists only very weakly in both, but in a slightly greater degree in the letter q than in the period. It exists in varying degrees in different human events. For instance, life exists to a greater degree in the scene from the island of Dominica, shown below on the left, than in the Harlem slum shown on the right.

In this chapter, I want to persuade the reader that almost all of us perceive this quality, and feel it as it occurs in varying degrees in different parts of space. And I want to lay the groundwork for a larger task: to persuade the reader that this quality is *real*. What I mean is that the different degree of life we observe in every dif-

ferent part of space is not merely an artifact of our cognition but is an objectively real physical phenomenon in space which our cognition detects.

I claim that this quality is not merely the basis for a distinction between beautiful things and ugly things. It is something which is detectable as a subtle distinction in every corner of the world, as we walk about, in the most ordinary places, during the most ordinary events. It is a quality which changes from place to place and from moment to moment, and which marks, in varying degrees, every moment, every event, every point in space.

In the following pairs of photographs I invite you to compare the *relative* degree of life in the two members of each pair. In each pair, I have put the example which seems to me to have more life on the left-hand side, and the one which seems to me to have less life on the right-hand side.

TWO PLACES IN POVERTY: ONE MORE ALIVE, ONE MUCH MORE DEAD



Shelter from the rain



Wasteland in Harlem

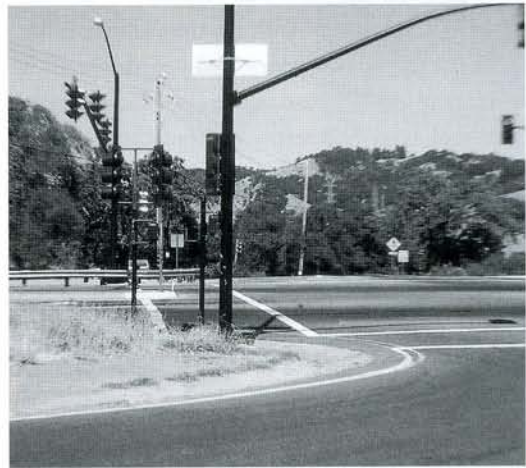
ROAD WITH TREES, ROAD WITH TRAFFIC LIGHTS

This example is rather obvious. The difference of life felt in these two photographs could be expressed in terms of precise biological concepts on the grounds that the one with trees has more liv-

ing organisms and hence must "obviously" feel more alive. But the degree of life in other examples does not depend only on the quantity of living organisms.



Suburban road with trees



Suburban road with traffic lights

ROAD WHICH IS KINDER TO THE HILLS, ROAD MORE HARSHLY CUT

The relative quantities of grass and trees visible in these two photos are roughly the same. But in the left-hand case the road is more harmoniously related to the hills — and a greater degree of life comes from this

harmony. The one on the right is a little more stark, more brutal. The one on the left seems kinder to the hills, makes you more aware of the nature of the hills. It is more fun to drive on, too.



Road which is kinder to the hills



Road cut through the hills

ROAD IN THE TREES, ROAD WITH OPEN HILLS

This pair is a little more puzzling. The left-hand road has more trees, more light and shade. It seems to have more life. The other has more dry grass. In this case intellectual judgment can make it hard to tell which one has more life. At first it is obvious: the left-hand example with the trees has more life. But if you start asking yourself why — there are just as many blades of grass as there are leaves on the trees, and so on — it seems to get muddled.

If, though, you don't allow yourself to think and you quickly, in two seconds, without time for thought, choose one, then you will — I believe — choose the one with the trees. The *feeling* is clear. Only the effort to find a theory to justify your intuition might confuse you. I believe the greater degree of life in the left-hand one has something to do with the dark and light. It is the *light* which has more life in the place on the left.



Road in the trees



Road in the hills

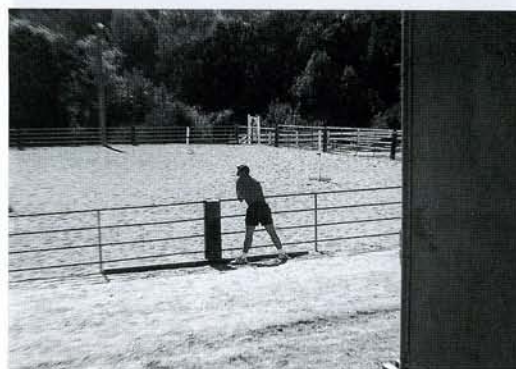
INSIDE THE STABLE, OUTSIDE THE STABLE

Both these places in a riding stable have industrial fixtures, bars, fences, and a person. But the one in the open has a kind of deadness about it, even though the photo is mainly focused on a man watching the horses. The interior of the barn, though

darker, has a more comfortable quality, and is less stark. In this pair, one may start to see that the feeling of life we experience in different places can be a subtle matter and that we may have to consult our feelings carefully to get clear about it.



In the stable



Watching a horse ring

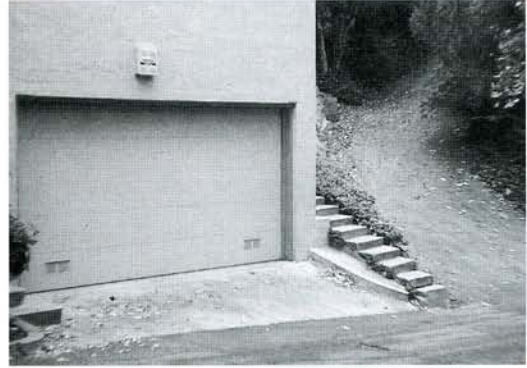
MORE FRIENDLY HOUSE EDGE, LESS FRIENDLY HOUSE EDGE

In this case perhaps it is the amount of detail, the pots of flowers, the differentiation, the comfortable completion, which brings the place on the left to life. This differentiation is

mostly missing in the house on the right. The place on the left is more cared for. It has a finer grain. Perhaps this finer grain *itself* is responsible for the feeling that there is more life.



Friendly edge to a house



Less friendly edge

ORDINARY PICKUP TRUCK, ORGANIC PAINTED CAR

The "funky and organic" image is not always the one with more life. Here the painted car from California seems to symbolize life, and might therefore be chosen as more alive by an unwary reader.

But if you ask yourself which of the two *actually* has more life, makes you feel more in touch

with life in yourself, has more of the truth of everyday events in it, you may then find that the pickup truck, ordinary though it is, is more genuinely in touch with life, more connected.

The organic car is more an image than it is genuinely connected to life. The pickup truck looks less inspired, but is more truly alive.



Ordinary pickup truck



The organic painted car

TWO VIEWS OF THE SAME BEDROOM

Here we see two different views of the same corner in a room. One focuses on the windows, and on a zone which has less life. The other focuses on the table behind the bed, and on the personal things lying there. The second, as framed, has more life.

The difference in degree is fairly obvious. But it is worth thinking about because if you are not

used to making this distinction, it just may not occur to you that even within one room, one zone may be compared with another for the amount of life which each contains. In this particular case it is the zone which is more utilized because of its relation to living people, and because of the degree of adaptation and comfort that has happened there, which gives it greater life.



The zone behind the bed



The zone of the windows

TWO PARKING LOTS AT THE UNIVERSITY OF CALIFORNIA

These two examples are intentionally similar in their degree of life. They lie less than fifty feet apart at the University of California. But if you ask which one has more life, and which makes you feel more alive within yourself, to look at, or to be

there, you will probably choose the left-hand one. Is it the irregularity of the cars? Or the presence of the smaller scale introduced by the smaller building? It is hard to be sure of the reason, but the subtle fact remains.



Parking lot with slightly more life. Cars are placed in irregular ways, the small building enters the space and creates more relationship



Parking lot with slightly less life. Because the cars are in a uniform row, the space is larger, more homogeneous, less personal.

GIRL IN MIRROR AND MODEL IN ADVERTISEMENT

The girl looking at herself in the mirror of a machine at Coney Island has more zest, more love of life at this moment, than the more

posed model in the advertisement. In this case the one which is posed, not surprisingly, is the one which has *less* life.



Teenager at Coney Island



Advertisement from Vogue

LOBBIES OF TWO OFFICE BUILDINGS

This case is interesting. Surprisingly, the one which is more slick has *more* life. The left-hand lobby is slightly more polished, more slick even; and *yet* it has more life. It is because a luminous quality in the place makes it attractive, makes it

seem like something that elevates you as you walk through it. The right-hand one has less to commend it. Though filled with people, it has more glare, is less friendly, is more dead in feeling, has less life in it.



More lucent, life-giving interior



Muddled, more dead interior

THE PHENOMENON OF LIFE

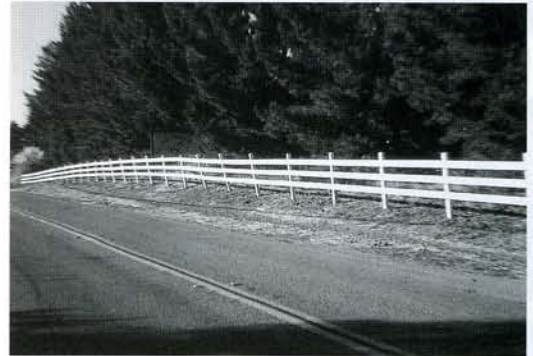
OLD FENCE, NEW FENCE

Here the more broken-down example has more life, not less. The older fence definitely seems to have more life. It is weathered, leaning over, adapted to wind, land, water. We get

a glimpse here of the fact that life is dependent in some way on time; and that subtle differentiation, adaptation, is a part of what we feel as life.



Old fence



New fence

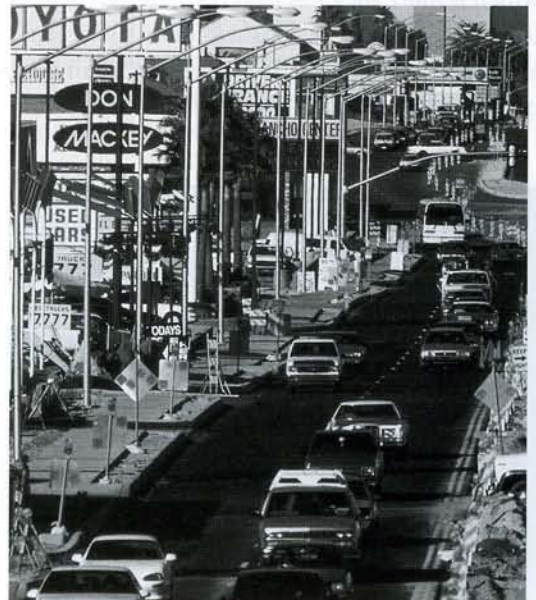
TWO DOWNTOWN STREETS

Two congested streets, both in downtown areas of cities, Tucson and Annapolis. Still, one of them (Annapolis) has detectably more

life than the other. The *degree* of life is always there, whether the thing is good or bad.



Annapolis, Maryland



Speedway Boulevard in Tucson, Arizona

TWO PARTS OF SHANGHAI



*Downtown Shanghai, ugly but still dynamic,
the throb of human existence*

Of these two massively built downtown areas, neither are heaven on earth. But still the left-hand one has some vibrancy, some likelihood of human stories, some intense life lived amid the hardness that one sees in the picture. In the right-hand picture, the hardness runs deeper, it is more anal and sterile and repetitive: and one guesses at, and feels, less life in *that* place.



*Downtown Shanghai again, but more anal, repetitive,
and paralyzed*



2 / THE UNIVERSAL FEELING ON WHICH
THESE FACTS ARE BASED

What exactly is the nature of the facts which I am bringing forward with all these examples? The essential fact is that in these cases, at least for many of us, the left-hand example of each pair *feels* more alive than the right-hand example. It is too early yet to describe what lies behind this feeling, or to try to explain it. But I urge you to recognize that the subtle distinction — if you also experience it, as I hope you do — is empirically real, even for cases where not much distinction seems to exist. Even though in a few cases you may have made a different judgment from

the one I have made, still I think you will have found that, broadly, you and I agree.

In our daily life, we can make similar distinctions, comparing places, objects, social situations, even human actions and ecological systems — two leaves, two bends in a river, and so on. We can make these distinctions even in cases that are only slightly different. And, of course, the quality being distinguished, this mysterious *life*, can appear in very great degree also. The pictures in chapter 1 show more extreme examples in which the life appears to a very great degree.

In historic times, and in many so-called primitive cultures, it was commonplace for people to understand that different places in the world had different degrees of life or spirit. For example, in tribal African societies and among California Indians or Australian aborigines, it was common to recognize a distinction between one tree and another, one rock and another, recognizing that even though all rocks have their life, still, this rock has more life, or more spirit; or this place has a special significance. The Yurok Indians of California, befriended by T. T. Waterman, made innumerable distinctions of this kind, which he recorded: it was common for

example for a particular rock to be known as 'fishing rock', or a certain tree to be known as the tree for such and such a purpose.¹

We too — even *with* our scientific heritage — feel one place to be more significant than another. We feel that a certain tree, or a certain rock, or a certain cliff edge, or a certain clearing, has great power or spirit — or at least, we acknowledge that we feel awe in that place, or we feel an intensity of life. Furthermore, this experience is shared and common. It is not idiosyncratic. Many people feel the same way about just *this* bend in the Columbia River, *this* garden gate, *this* room, *this* bridge, *this* stream, *this* beach.



3 / OUR DIFFICULTY IN RECOGNIZING THE GENERAL QUALITY OF LIFE IN THINGS

Nevertheless, I suspect that many thoughtful readers will have some difficulty with the nature of these facts. Some readers may, indeed, question whether what I call facts are facts, and whether the phenomenon I have indicated is reliable.

This seems an understandable reaction to my proposal. If something of such significance *were* true in a sense that we of the modern era could accept, one would expect it to be widely known and agreed upon, and one would expect it to be an acknowledged part of our society. If it were true (and generally recognized) that different parts of the world could be more alive and less alive, this fact would then quite naturally be the backbone of all our ideas about architecture and planning.

But it is clearly not the explicit backbone of our thought today. This would seem to speak against the fact which I am claiming. Indeed you, the reader, may have noticed that your first inclination, in at least some of the examples, was to judge them differently from the way I judged them. Is it not likely, then, that this sense of more life or less life in things is a private, idiosyncratic judgment without firm empirical content?

Certainly, if it were indeed merely a personal value judgment, our current sense of how things are in the world would remain intact. On the other hand, if it really were true — objectively — that different parts of space have more life and less life, this fact would have massive impact on our understanding of the world.

It is, therefore, far easier to assume that this is *not* true. It is difficult to believe that space itself can be alive, in greater or lesser degree. The idea that one part of space might have relatively more life, and another might have less life — and the idea that this distinction would not be based on the presence of biological organisms but might instead be inherent in the space itself according to its structure — would challenge our beliefs about the world to the very roots.

I believe many people who first encounter this idea, at first experience an instinctive refusal to trust the evidence of their own senses in this matter.² But in my view, to grapple with the idea successfully, we must overcome this knee-jerk refusal. To make that possible, I shall, in the next two sections, describe pairs where the relative degree of life is obvious.



4 / THE BANGKOK SLUM HOUSE AND THE POSTMODERN HOUSE

In 1992 I was lecturing to 110 architecture students at the University of California,³ and put on the screen the Bangkok slum house and the postmodern octagonal tower which are shown again here. I asked the students to choose which of the two, for them, seemed to have more life.

For some people the answer was obvious. For others, it was at first not a comfortable question. Some asked "What do you mean? What is the question supposed to mean? What is your definition of life?" and so on. I made it clear that I was not asking people to make a factual judgment, but just to decide which of the two, according to their own feeling, *appeared* to have more life. Even so, the question was not quite comfortable for everyone.

To make the question more tolerable, I then asked the students to put themselves in one of the following three categories:

- *Those who feel the Bangkok house has more life.*
- *Those who feel the octagonal house has more life.*
- *Those for whom the question just doesn't make sense, or who do not wish to answer it even by basing an answer on their own feeling.*



Bangkok slum house

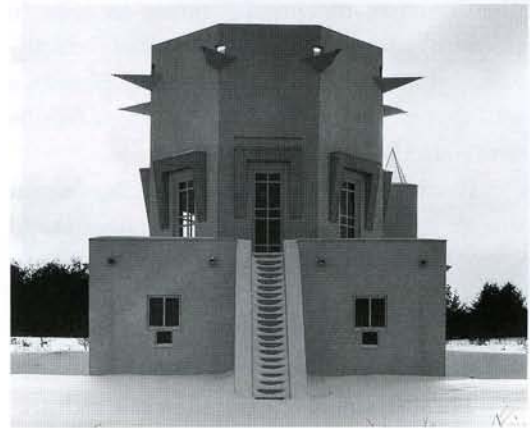
Here are the results:

- *Eighty-nine said that the Bangkok slum house has more life.*
- *Twenty-one chose to say that the question didn't make sense to them, or that they couldn't or didn't want to make a choice.*
- *No one said that the octagonal tower has more life.*

To repeat, out of those 110 people, *not a single one of them wanted to say (or was willing to say) that the postmodern building had more life than the Bangkok house.* This shows an extraordinarily high level of agreement.

Of course the question — and my choice of these two examples — may be ridiculed. The octagonal house looks uninhabited. Was this experiment simply a vote which says that one is occupied and the other isn't? If so, that would not mean much.

But, under the surface, it was clear, even to people who raised this kind of skeptical objection, that something was going on here. Several of the architecture students among the twenty-one who said they could not judge the issue later came to me and told me that they had felt that the slum has more life, but did not feel comfort-



The postmodern house

able *saying* so. Why not, if the question was indeed so trivial?

I believe it was not trivial, and did not seem trivial to them. I believe that these students were embarrassed by a conflict between the values they were being taught in architecture school, and a truth they perceived and could not deny. In spite of themselves, they saw some quality of ordinary life, with all the feelings that entails, present in the slum, regardless of its poverty, hunger, and disease. And there is some quality of absence of life visible in the octagonal tower which does not go away even if I say that it will be occupied tomorrow.

Thus, in my view, the sense one has in making this judgment is that it is about something real. And because of this, people tend to agree. Indeed it *is* about something real.

The power of the effect is remarkable — especially when one remembers that most of the hundred-odd people in the audience were architecture students. Given the cultural milieu and ethos of the late 20th century, many of them had come to school to learn how to build things like the postmodern tower. If a hundred of these

students were asked to say which of these two things had more life, and not one of them could bring himself or herself to say that the obviously more architectural one (the one which is more similar to buildings that have been held up to them as models of architecture in other classes) had more life, it is clear that something remarkable was going on under the surface.

Indeed, I think there is no doubt that the students — many of them anyway — found the question disturbing, almost as if a secret, a hidden truth, were being dragged from them in spite of themselves. After having said that the Bangkok house has more life, could that same student then honestly say to himself: “Anyway, the octagonal tower is better,” or even, “Postmodern architecture is good”?

Simple though it is, the question has the power to bring perverted values into doubt. The students may have felt it was irritating, silly, an unreasonable question. A few abstained, apparently because they did not like the question, or felt it could not properly be answered. But nevertheless the fact is that the vast majority did, when asked the question, make *this* judgment, not the other.



5 / THE ILLUMINATED MANUSCRIPT AND THE AUDITORIUM DETAIL

On another occasion, I did a similar experiment, asking students to compare a picture of an illuminated manuscript (as shown in color in chapter 1) with a section of the wall of the auditorium where the lecture was taking place — a wall that was decorated in postmodern fashion with round brass lights and brass strips.

Once again there was strong agreement that, of the two, the illuminated manuscript had more life. But as before, for some students their agreement was reluctant; they expressed themselves irritated by the question, and felt that it was false or “rigged.”

The discomfort was voiced by one architecture student who complained that the compari-

son was “unfair.” I asked what it meant to say that it was unfair. The answer came back that in some sneaky sense it seemed to be showing modern architecture in a bad light. Another student complained that the illuminated manuscript was “old.” I asked what that had to do with the empirical question: which of the two has more life according to your intuitive, immediate feeling? The answer came back, again, that since it was old it was irrelevant, and it was not a “fair” comparison. But the point of the demonstration was simply to show that people do, indeed, react to things according to the degree of life they have, and that they often agree about it. The very objections that were raised, showed that for the

complainers, too, this was undeniable. And as such, by introducing the idea that such judgments might be objective, the demonstrations cut, once again, to the root of the arbitrariness they were being taught in school, and made the students nervous.

The irritation which students expressed sheds important light on the nature of the phenomenon. It was clear, in the context in which I was asking these questions, that I intended to use the criterion of life as a basis for making distinctions about good and bad in architecture, and that I was intending, further, to encourage students to make buildings which have as much life as possible. Although, on the face of it, it would seem innocent enough and unobjectionable, to ask which one has more life, I believe that it goes to the core of present ills in architectural education and architectural practice.

Is the foundation of modern architecture threatened by this innocent question?

Students found themselves having to stall in order to overcome this awkward intellectual dilemma. They wanted, perhaps, to give the impression that this criterion was hard to apply. And yet to their surprise they found that it was in fact rather easy to apply. Furthermore, the objects which this criterion singled out were not the

models of architecture currently in fashion, but, on the contrary, other things.

It would almost appear, then, that the present fashion in architecture is so hollow that its adherents need to prop it up by refusing to see the life in things, or by refusing to apply this criterion to decide what is good, bad, better. The more one looks at it, the more it seems that the very existence of the criterion threatens the existing intellectual order in the field of architecture.

In short, I believe that architects and architecture students sometimes become uncomfortable when facing this question, because the moment it is asked, they already sense that most people will answer it the same way, and this will be a way which does not speak well for current standards in architecture.

The fact that the life which is being measured has no clear meaning within contemporary biological thought can also cause serious difficulties. Since there is no academic framework on which to pin the question, it can raise doubts of an intellectual nature. Some people have made it clear to me that they are uncomfortable because they cannot make sense of the question, cannot express it in acceptable scientific terms, cannot define for themselves what the



7th century Christian illuminated manuscript



Auditorium wall in Wurster Hall,
Berkeley, California

question might really be about. It almost seems to open the door to something forbidden.

The revealing and vital character of this "life" we see and feel in things will become more clear if I draw attention to its "dangerous" character. During the last thirty years I have come to believe that it is difficult to see and accept the existence of life in things, because the social implications of its existence are so extensive. Put simply, if this life in things really exists as I am claiming, that fact alone has enormous ramifications; it implies that many things in our society and way of life may have to change. Fear or a natural reluctance to consider these changes makes us intellectually timid, and less open to the fact itself. Thus one may be unwilling to recognize the existence of this "life" in things, because of a dim — and sometimes perhaps not-so-dim — awareness that if it does exist, then everything in society, and in our view of the world, must change.⁴

For this reason, in a dialogue with a person who is experiencing this kind of trouble, I try to relax him by saying, "I know the question may seem like nonsense, please just go along with me, forget whether the question means anything sensible or not, just give the first answer that comes into your head. To you, which of these two *feels* more alive?" Once relaxed like this, the person is often more forthcoming, and more willing to express what he feels.

But even then, the nagging voice comes back: "What does this mean? Is it a game?

Where is it leading?" And this nagging voice is made louder by the fact that, no matter what they say, we suspect that most people will give the same answer. All the defenses, which are created in our minds to protect the legitimacy of the mechanistic world-picture, start to argue against the question, do not like it being asked, want to characterize it as nonsense.

There is another reason for the irritation which people may feel. The architecture of the 20th century established certain accepted stylistic norms. The negative examples in both the comparisons I have given are typical of these norms. Yet they are clearly the ones where one feels *less* life. Immediately, this question therefore opens the door to a serious criticism of the architecture of the 20th century. If typical examples of good design by 20th-century standards have *less* life than a slum in Bangkok, and *less* life than an illuminated manuscript from the Middle Ages, any architect who wishes to defend modern and postmodern architecture will almost have to say, "This question doesn't make sense," just to defend his profession and his own self-worth as a professional.

Of course, the question "Which one makes you feel that it is more alive?" is at root simply empirical. But that is exactly why it is so disturbing. *Whatever* the question means, it seems to probe an area of thought which may have devastating results for the image-based style of architecture current toward the end of the 20th century.



6 / AN ENORMOUS FACT

The examples I have given make it rather clear that, when we go by feeling, there is something at work. We do notice differences in degrees of life in different places, even in the smallest aspects of our daily existence. To a large extent we agree about which cases have more life and less life. And in many cases we feel instinctively that

this greater or lesser life is inherent in the *thing*.

There is no obvious explanation to hand. The biological-mechanical definition of life does not explain these distinctions. Indeed, not one of the kinds of explanations I have given in my informal comments has the power to explain *all* the cases.

But there is a growing suspicion — perhaps shared by the reader — that there may be some structure common to all the examples. So many of the reasons for more life in one thing than another refer to structural features: the light, the level of detail, the roundness and completeness, the subtlety, and so forth. Nevertheless, all one can really say with any degree of certainty at this stage is that the judgment about life appears to be a fundamental, primitive quality in things, a fundamental judgment about the world, which appears in every aspect of reality that we encounter.

It is strange that a phenomenon of such power and of such generality — if true — should be missing from our general way of understanding the world. The simplicity of this idea should not make us miss its truly enormous stature. We seem to have a fundamental observation — so far unexplained — that among pairs of events, bits of space, places, and particles of existence, *we can usually judge that one has a greater degree of life and the other less*, at least according to our

feeling. And we have the observation that our experience of this life in things is roughly consistent from person to person.

It is hard to see how society could form a proper conception of its own existence without being cognizant of this fact. Yet, for the last hundred years, modern society has existed almost without this knowledge — and has even built institutions, organizations, and procedures on the basis of conceptions which are absolutely at odds with it.

The possibility that the degree of life of different things and places and events is *objective* — not solely in the individual — implies that this “felt” life has some part in the scheme of things that is truly enormous. If so, the existence of this felt life — existing as it must to some degree in every single thing there is — would be a discovery, an awakening, at an extraordinary level, perhaps comparable to the 16th-century discovery of the fact that the earth moves round the sun, or the 19th-century discovery of the electromagnetic nature of light.



7 / MY FUNDAMENTAL HYPOTHESIS

Over the years, the observations of this chapter — and others like them which my colleagues and I have made repeatedly during the last twenty years — have led me to believe that the difference in degree of life that we discern in things is not a subjective assessment, but an objective one.⁵ It describes something about the world, which exists in the world, and resides in structure.

I state this by means of the following hypothesis: *What we call “life” is a general condition which exists, to some degree or other, in every part of space: brick, stone, grass, river, painting, building, daffodil, human being, forest, city. And further: The key to this idea is that every part of space — every connected region of space, small or large — has some degree of life, and that this degree of life is well defined, objectively existing, and measurable.*

The hypothesis means that every part of a building — every windowsill, every step, each speck of dust, the space between this chair and that wall, the roof, the space under the eave, this concrete path, that parking space, the line between the parking spaces — each one has its degree of life. The hypothesis is simple. But it is certainly not something we can consider established. As we shall see in later parts of the book, even the scientific techniques for deciding, empirically, whether indeed this is true or not true are subtle and refined.⁶ I cannot therefore expect the reader to assume that this hypothesis is true. I simply ask that the reader consider that it *might* be true. I shall then try to present an accumulation of evidence and experience which will persuade the reader that indeed it is true.

The hypothesis appears novel, perhaps because it is so much at odds with the currently popular mechanistic conception of the world which we accept almost without thinking. But I shall try to show that my hypothesis is not a romantic bit

of wishful thinking, but that it is an idea which can be formulated precisely in structural terms that can take their place as a normal part of the scientific world-picture.

NOTES

1. Waterman was an anthropologist who worked in the Department of Anthropology at the University of California, Berkeley, during the early decades of the 20th century. The directness and earthiness of his descriptions always impressed me. T. T. Waterman, *YUOK GEOGRAPHY* (Berkeley, California: University of California Publications in American Archaeology and Ethnology, 1920, 16 no. 5, 177-314).

2. I believe the reluctance which we may feel in accepting that life and degree of life really are general phenomena, is inevitable — because it comes about as a result of that mechanistic world-view which I have discussed in the preface.

3. Department of Architecture, Fall 1992.

4. For example, in 1991, during public discussion of high-density apartment buildings in Japan, I proposed a form of housing single families in 2 1/2-story cottages, with small lanes, and in which every family has a garden. Rather surprisingly, this kind of housing can be built at 80 families to the acre (200 per hectare) — the same density as typical present-day Japanese high-rise apartment buildings which are 10 to 14 stories high. The cost is the same, too. Which one, therefore, should one build?

In order to help the city of Nagoya, my colleagues in Japan made a survey in which 100 family members were asked to describe their feelings about the kind of housing I had proposed, compared with the 14-story apartment buildings that are usually built at the same cost and density. They were asked which one they preferred, and also which of the two environments seemed, to them, to have more life. Once this survey was made it showed overwhelmingly that the families questioned preferred the low-rise housing. The survey also showed that the families considered this to be a matter of degree of life and that the low-rise housing, in their view, had more life (Hisae Hosoi, *OPINIONS OF ONE HUNDRED FAMILIES ABOUT LOW-RISE AND HIGH-RISE APARTMENTS*, unpublished ms., Tokyo, 1991).

However, it was surprisingly hard even to get permission to make this survey in the first place. Public agencies in Nagoya went to some trouble to *prevent this survey from being made at all* by interfering with practical details of the survey process, and by trying to change the questions. I believe this interference happened because, intuitively, the officials working in the agencies guessed what result the survey would have

(after all, they themselves would probably have given the very same answers everyone else gave), and yet knew that these answers were at odds with existing policy. They feared this result, and therefore did not want a public survey asking *these* questions at all. (Details of their attempt to prevent this survey from taking place are given in Christopher Alexander and Hisae Hosoi, *THE PRECIOUS JEWEL*, forthcoming.) The reason is not hard to find. The form of high-density low-rise housing which I proposed in Japan would — if accepted — upset many present-day forms of land speculation, especially those now seeking to go to still higher levels of density, which would be hampered by natural limits inherent in the low-rise plan. Money interests in Japan therefore supported those who sought to avoid public exposition of these facts.

The very existence of a *fact* that one kind of housing has more life than the other — if this is indeed a fact — can be potentially unsettling. For a housing ministry, for city departments, developers, banks, and other related interests, even established architectural and construction practices, exploration or even open discussion and acknowledgment of such a fact about degree of life in housing projects, can bring into question a wide variety of firmly held assumptions about architecture and economics.

It is therefore natural that those associated with entrenched interests will assert that the greater life of the one design compared with the other is just a matter of opinion. All this makes the fact itself more difficult to see, more difficult to acknowledge, more difficult to recognize as intellectually and empirically sound.

5. Extensive studies demonstrating the empirical validity and replicability of these judgments have been made by my colleague Professor Hansjoachim Neis, who has undertaken experiments of this kind repeatedly during the last fifteen years. Other studies which confirm the existence of such judgments as repeatable and objective include: Cristina Piza de Toledo, "Empirical Studies Judging the Degree of Life in Photos of Buildings and of Artifacts," masters thesis, University of California, Berkeley, Architecture Department, 1974; Hansjoachim Neis, "City Building: Models for the Formation of Larger Urban Wholes," Ph.D. diss., University of California, Berkeley, Architecture Department, 1989.

6. See chapter 9.

CHAPTER THREE

WHOLENESS

AND

THE THEORY OF CENTERS

1 / INTRODUCTION

I believe we can understand how "life" is made in buildings, and I offer in what follows a language within which we can begin to describe the phenomenon.

In order to understand life as a phenomenon, it is necessary to define something which I call "the wholeness" and also certain crucial entities which I call "centers," the building blocks of wholeness. These concepts — and therefore the chapter too — are rather abstract. However, I must ask the reader to try to grasp

and use these concepts, because the wholeness as I define it, and the centers I shall define as the building blocks of wholeness are, in my view, the indispensable tools needed to understand life. With these definitions, we shall be able to see the way that life comes about (chapter 4), the structural features which all life has (chapter 5), the nature of function and ornament (chapter 12). Allow these pages to prepare the groundwork for our ability to understand life as a structure.



2 / THE IDEA OF WHOLENESS

Intuitively we may guess that the beauty of a building, its life, and its capacity to support life all come from the fact that it is working as a whole. A view of the building as a whole means that we see it as part of an extended and undivided continuum. It is not an isolated fragment in itself, but part of the world which includes the gardens, walls, trees, streets beyond its boundaries, and other buildings beyond those. And it contains many wholes within it — also unbounded and continuous in their connections. Above all, the whole is unbroken and undivided.

This rather obvious idea, though we may assume it to be true, does not yet have a precise counterpart in our professional or scientific analysis of buildings. As a general idea, wholeness has been widely discussed by many writers in the 20th century: it is one of the main themes of contemporary thought.¹ In physics, the local behavior of an electron is affected by the larger configuration of the experiment in which it moves.² The local behavior of a gravitational particle is affected by the large-scale gravitational field that is created by the particles.³ In biology, Hans Spemann's experiments have

shown how the growing cells in an embryo are affected by their position in the whole.⁴ In neurophysiology, Karl Lashley's experiments on the engram led to his discoveries that any particular memory is encoded not at some locus, but somehow throughout the whole.⁵ In medicine, J. S. Haldane's discussion of the lung and his explanation of the impossibility of drawing any definite boundary around the organism showed that there is an inseparable quality in which organism and environment are bound together and exist as one whole.⁶ In cosmology, there is Ernst Mach's principle: the idea that the gravitational constant, G (and hence the force of gravity), is somehow a function of all the matter existing in the universe.⁷ Recent work on the overall ecology of Earth has even shown benefits in regarding the whole planet as a single organism.⁸

In all these examples, the *wholeness* is the important thing: the local parts exist chiefly in relation to the whole, and their behavior and character and structure are determined by the larger whole in which they exist and which they create.

Although wholeness has, in this intuitive sense, played such a role in contemporary thought, no one has shown how to represent wholeness. We can talk about wholeness, we can be aware of the necessity of seeing things in their wholeness—but no one has yet formulated a way of understanding just what this wholeness *is*, in precise terms. We have not been able to represent the whole, or even to isolate, in precise mathematical language, what we mean by the whole.

Most artists and architects know, intuitively, that buildings also work primarily as *wholes*, and that the built world must therefore also be seen in its wholeness. But again—as in the other cases from the recent history of science—we do not yet have the intellectual tools which show us how to do it. We do not yet have a precise

model of a structure we might call “the wholeness” of the built world, or any clear picture of the way this “wholeness” might then contribute to the behavior of the buildings and spaces, what happens there, how it affects us. Nor do we know why it would make sense to say that it is only accurate to see a building working “as a whole.”

After many years of thinking, I believe that I have been able to define, in precise language, what we mean by the wholeness of a given situation. The fundamental idea is that we *can* define wholeness exactly as a structure. This structure is defined in mathematical language in appendix 1. It is a rather complex structure, analogous in some ways to the underlying structures defined in topology. In the following sections I shall try to explain this idea in informal language, by means of examples.



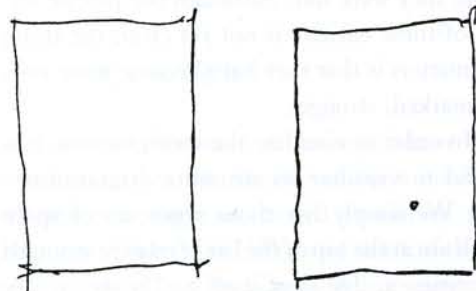
3 / AN EXAMPLE OF THE WHOLENESS IN A SIMPLE CASE

The general idea is that the wholeness in any part of space is the structure defined by all the various coherent entities that exist in that part of space, and the way these entities are nested in and overlap each other.

To come to grips with this idea, I start by considering a very simple structure, and examining it from the point of view of its wholeness. On the right is a sketch of a blank sheet of paper. Then I place one dot on it. Although the dot is tiny, its impact on the sheet of paper is very great. The blank sheet of paper is one whole, one kind of wholeness. With the introduction of the tiny dot, the wholeness changes dramatically. Its gestalt changes. We begin to experience a subtle and pervasive shift in the whole. The space changes throughout the sheet of paper (and not only where the dot is), vectors are created, differentiations reaching far beyond the dot itself occur within the space. As a whole, an entirely new configuration has come into being, and this configuration extends across the sheet of paper as a whole.

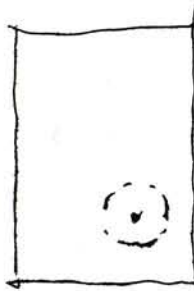
Any reasonable description of wholeness must capture this subtle and pervasive effect. But how is it to work?

What is the configuration which exists after I place the dot? It may be described like this: around the dot, there is a kind of halo. Where the dot has been placed, a larger entity of some kind is created. Also, on each side of the dot, passing the dot tangentially, rectangles of white paper become visible, as further ‘latent’ entities (see diagram on next page). There are four of

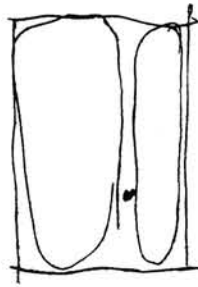


A blank sheet of paper

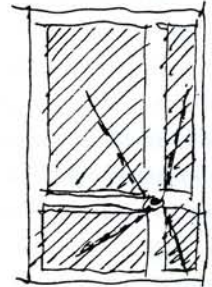
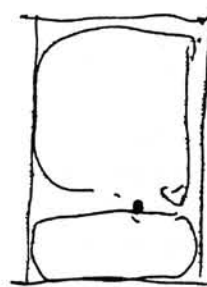
*Blank sheet with
a single dot*



Halo round the dot



Four largest latent rectangles, creating four other rectangles in the corners, by their overlap. These are seen on the right.



System of rays

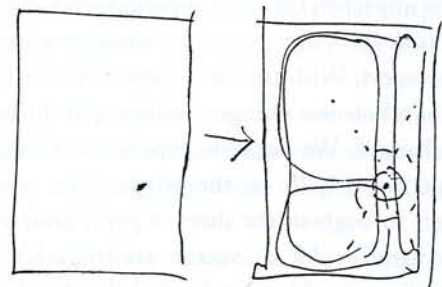
these rectangles, and where they cross four other rectangles are formed in the four corners of the sheet (again, see diagram). These corner rectangles are formed by the overlap of the other rectangles, but are also induced by the presence of the dots. In addition, there are rays visible: four white rays going out from the dot parallel to the sides and forming a cross; and four other rays going from the dot towards the four corners. These four rays are not all equally strong. Their relative strength depends on where the dot is on the paper.

Therefore, including the main entity of the sheet itself, there are at least twenty entities created in the space of the paper by the dot. Just what these entities are, is not yet clear, but they are zones, visible as wholes in some fashion. All we can really say is that when we place the dot, these zones become marked in some way, they become visible, they stand out. In some fashion they become coherent, or differentiated, where before they were not. Although the precise nature of these entities is not yet clear, the thing that matters is that they have become more visible, marked, stronger.

In order to visualize the configuration, it is helpful to visualize its structure diagrammatically. We simply list those segments of space which are at the top of the list of relative strength as entities: 1. *The sheet itself.* 2. *The dot.* 3. *The halo around the dot.* 4. *Bottom rectangle trapped by dot.* 5. *Left-hand rectangle trapped by dot.*

6. *Right-hand rectangle trapped by dot.* 7. *Top rectangle trapped by dot.* 8. *Top left corner.* 9. *Top right corner.* 10. *Bottom left corner.* 11. *Bottom right corner.* 12. *The ray going up from dot.* 13. *Ray going down from dot.* 14. *Ray going left from dot.* 15. *Ray going right from dot.* 16. *The white cross formed by these four rays.* 17. *Diagonal ray from dot to nearest corner.* 18. *Diagonal ray from dot to next corner.* 19. *Ray from dot to third corner.* 20. *Ray from dot to furthest corner.*

The basic idea of the wholeness, as I define it, is that these stronger zones or entities, together, define the structure which we recognize as the wholeness of the sheet of paper with the dot. I refer to this structure as the wholeness, or *W*. The formal, mathematical definition of wholeness, expressing it as a system of overlapping entities, is given in appendices 1 to 3.⁹



A diagram of the wholeness: here we see the system of all twenty most salient entities, overlapping each other and seen as one system. Bear in mind that this is the wholeness for a simple dot on a single rectangular sheet.



4 / THE ORIGIN OF THE STRENGTH IN ENTITIES

What is the origin of the “strength” that makes a few special segments stand out as coherent entities to create wholeness? Their strength and centeredness come from a combination of factors that all depend on the overall configuration of the space.

In the example of the sheet with a single dot, we have some centers at the corners — these are zones of space which are highly differentiated. The large rectangles which “fill” the page on the four sides of the dot are the largest symmetrical chunks of space which exist without running into an edge; they are the largest symmetries left intact by the presence of the dot. It is their homogeneity which marks them. The dot itself is marked, of course, because it has a physical differentiation of color. The lines forming rays from the dot to the corner are created again by local symmetries focused on the two points that form the ends of each ray.

We can begin to give general rules which will identify the zones of space that stand out as centers in any given configuration. For example:

- *The sets which appear as entities are often locally symmetrical — but not always.*
- *The entities are usually bounded: that is, at their edge, there is often a sharp change of structure.*

- *Some of the entities are marked by an internal center where there is another change of continuity near the middle of the center itself.*
- *There is a simplicity and regularity about these sets which marks them as wholes, and makes them function as entities.*
- *They are often relatively homogeneous across their interior, compared with the surrounding space.*
- *There is a topological connectivity in them which marks them as compact.*
- *They are usually — not always — convex.*

This list of characteristics is incomplete, but it begins to suggest the kinds of features which cause the coherence of a segment of space to occur.¹⁰ Later (chapters 4 and 5) we shall see that more complex entities are formed in far more complex ways.

The entities which come into existence in a configuration are not merely cognitive. They have a real mathematical existence, and are actually occurring features *of the space itself*. They may be established mathematically according to the relative hierarchies of differentiation in the space. They are mathematically and physically *real*.

And they have different degrees of strength.



5 / THE CONCEPT OF A CENTER

Let us now consider the nature of the entities from which wholeness is built. We may consider any configuration in the world, a building, a street, a room full of people playing cards, a crowd of people, a forest. Each has its wholeness. By that I mean that there are visible within that thing, a huge number of entities, at different

scales, formed very much in the ways I have described, and that the totality of these entities with the way they are nested constitute the wholeness of that thing.¹¹ We may think of these entities as parts (as they may sometimes seem to us) or as local wholes or sub-wholes. But, as I have illustrated in the case of the sheet of paper

and the dot, these parts and entities are rarely pre-existing. They are more often themselves *created* by the wholeness. This apparent paradox (seeming paradoxical only because of the simple-minded way in which it is expressed) is a fundamental issue in the nature of wholeness: the wholeness is made of parts; the parts are created by the wholeness. To understand wholeness we must have a conception in which "parts" and wholes work in this holistic way.

To have a consistent way of talking about these entities, during recent years, I have learned to call them all (whether parts or local wholes or hardly visible coherent entities), "centers."¹² What this means is that each one of these entities has, as its defining mark, *the fact that it appears to exist as a local center within a larger whole*. It is a phenomenon of centeredness in space. Thus a human head, or ear, or finger is a discernible whole. It is also, both visually and functionally, a center. We experience it as a center. And it is, in the end, its centeredness which is its most clear, defining mark.

In using the word center in this way, I am not referring at all to a point center like a center of gravity. I use the word center to identify an organized zone of space — that is to say, a distinct set of points in space, which, because of its organization, because of its internal coherence, and because of its relation to its context, *exhibits centeredness*, forms a local zone of relative centeredness with respect to the other parts of space. *When I use the word center, I am always referring to a physical set, a distinct physical system, which occupies a certain volume in space, and has a special marked coherence*. Even when the center is a social or cultural center, it is still ultimately spatial as well: it occurs in space, and always has a spatial locus.¹³

There is a mathematical reason for thinking of the coherent entities in the world as centers, not as wholes. If I want to be accurate about a whole, it is natural for me to ask where that whole starts and stops. Suppose, for example, I am talking about a fishpond, and want to call it a whole. To be accurate about it in a mathematical

theory, I want to be able to draw a precise boundary around this whole, and say for each point in space whether it is part of this set of points or not. But this is very hard to do. Obviously the water is part of the fishpond. What about the concrete it is made of, or the clay under the ground? Is this part of the whole we call "the pond"? How deep does it go? Do I include the air which is just above the pond? Is that part of the pond? What about the pipes bringing in the water? These are uncomfortable questions, and they are not trivial. There is no *natural* way to draw a boundary around the pond which gets just the right things, and leaves out just the right things. In a very rigid way of thinking, this would make it seem that the pond does not really exist as a whole. Obviously this is the wrong conclusion. The pond does exist. Our trouble is that we don't know how to define it exactly. But the trouble comes from referring to it as a "whole." That kind of terminology seems to make it necessary for me to draw an exact boundary, including just those things which are part of the pond, and leaving out just those which aren't. That is the mistake.¹⁴

When I call the pond a center, the situation changes. I can then recognize the fact that the pond does have existence as a local center of activity: a living system. It is a focused entity. But the fuzziness of its edges becomes less problematic. The reason is that the pond, as an entity, is focused towards its center. It creates a field of centeredness. But, obviously, this effect falls off. The peripheral things play their role in the pond. But I do not need to make a definite commitment about the edge, and what is in and what is out, *because that is not the point*. What matters in the existence of the pond as a coherent entity is that the organization of the pond is caused by a field effect in which the various elements work together to produce this phenomenon of a center. This is true *physically* in the actual physical system of the pond: water, edge, shallows, gradients, lilies — all help in the formation of the pond as a center. And it is also true mentally in my *perception* of that pond. That is why it is more

useful, and more accurate, to call the pond a center rather than calling it a whole. The same is true for window, door, wall, or arch. None of them can be exactly bounded. They are all entities which have a fuzzy edge, and whose existence lies mainly in the fact that they exist as centers in the portion of the world which they inhabit.

There is yet another reason for preferring the term "center" to the term "whole." The entities we are concerned with in a building include the most ordinary elements like staircase, bathtub, door, kitchen sink, room, ceiling, doorway, window, curtain, and kitchen nook. Ultimately, in dealing with design, we have to ask, What is the proper relationship among these elements? Here again there is a powerful reason for using the term "center." From the point of view of relationships which appear in the design, it is more *useful* to call the kitchen sink a "center" than a "whole." If I call it a whole, it then exists in my mind as an isolated object. But if I call it a center, it already tells me something extra; it creates a sense, in my mind, of the way the sink is going to work *in* the kitchen. It makes me aware of the larger pattern of things, and the way this particular element — the kitchen sink — fits into that pattern, plays its role in that pattern. It makes the sink feel more like a thing which radiates out, extends beyond its own boundaries, and takes its part in the kitchen as a whole.

On the other hand, if I call the sink a whole I have more of a feeling of boundedness. I lose the relationships which exist among things. It is as if I have drawn a skin around the sink, made it entire within itself, but cut it off more from what surrounds it. I am therefore less aware of the relationships it has, or will have, or should have, with the larger kitchen, and think of it more in itself, enclosed and shut off.

On one occasion, I was discussing the concept of centers, as it applied to some bedroom curtains, with my wife Pamela. She made the comment that the use of the word "centers," as I had explained it to her, was already changing her view of everything around her, even as we were talking: "When I look at the curtain in the room, and think of the curtain, the curtain rod, the window, the sky, the light on the ceiling, as *centers*, then I become so much more cognizant of the relatedness of all things — it is as though my awareness increases, almost like eating the fruit in the garden of Eden; my eyes suddenly perceive everything in such a different way; I see the world in all its relatedness, and as it really is."

The same is true of all the entities which appear in the world. When I think of them as wholes, or entities, I focus on their boundedness, their separation. When I think of them as centers, I become more aware of their relatedness; I see them as focal points in a larger unbroken whole and I see the world as whole.



6 / WHOLENESS AS A SUBTLE STRUCTURE

In order to understand the way that centers are induced by the surrounding wholeness, let us refer once again to abstract examples. It is essential to note that the centers always become centers as a result of the configuration *as a whole*. For example, if I make a square like the one in the drawing on the next page, then this square appears as a strong center. If I add two black triangles to the configuration, then even though the

square is still there, the square is no longer very strong as a center, while other triangles have become relatively more strong and overshadow the original center, which has now "disappeared."

Thus the strength of any given center is not merely a function of the internal shape which creates that center in itself, but comes about as a result of the influence of many other factors which extend outward in the given region of



In the first sketch, the square appears as a strong center. In the second sketch, after addition of the dark triangles, even though the square is still there, it no longer has the same strength as a center, because of the changed condition in the configuration as a whole.

space, always as a result of the configuration *as a whole*. This follows, anyway, from the list of mathematical features which are responsible for causing the strength. Symmetry, connectedness, convexity, homogeneity, boundaries, sharp change of features, and so forth are all functions of the *configuration as a whole*. The centers which make up any given wholeness do not exist independently, but appear as elements which are generated *by* the configuration as a whole. It is the large-scale features of the configuration which produce the local centers and allow the local centers to 'settle out.'

The wholeness in any given part of space is highly fluid, and easily affected by very small changes of geometry. Indeed wholeness changes continuously through time, and is dependent on subtle — sometimes even minute — changes in the configurations in it and around it. This happens because the centers which occur are induced in a very subtle fashion, and therefore change quite markedly as even small changes are made in the fine structure of the configuration.

Consider again the sheet of paper and the dot. We have seen how one dot on the blank sheet of paper induces a widespread global structure in the wholeness of the sheet of paper. One little dot, whose area is no more than 0.0001 of the sheet, thoroughly changes the wholeness of the sheet.

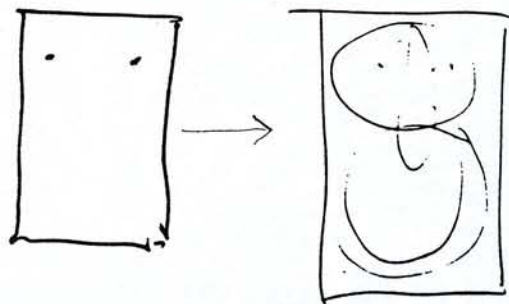
Now look (Case 1, next page) at what happens when another dot is added. Entirely different centers are strengthened, and the structure suddenly becomes like a head. Or look (Case 2) what happens when the second dot is added in a different position. Again quite new centers are

created and, as a result, the structure suddenly becomes diagonal-like, with induced triangles and an upward-thrusting diagonal line like an arrow.

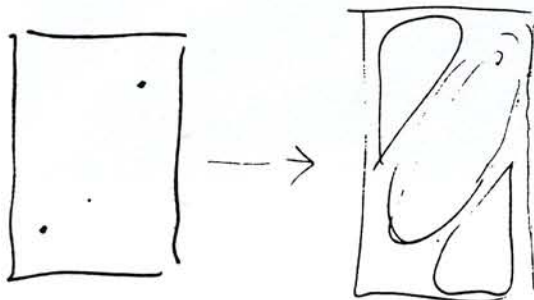
Like the first dot, each of these second dots is not more than 0.0001 of the sheet. Yet again this tiny change (tiny in actual area or volume) utterly alters the wholeness of what is there. So in each case the structure, which I call "the wholeness," of a thing is extremely susceptible to relatively minor changes in its details. The wholeness changes globally — and sometimes completely — as a result of very small local physical changes.

Thus it is clear that the wholeness is a structure of great subtlety *which is induced in the whole*. It cannot easily be predicted from the parts, *and it is useless to think of it as a relationship "among the parts."* The wholeness is an autonomous and global structure, which is induced by the details of the configuration. It is a real physical and mathematical structure in space — but it is created indirectly, by symmetries and other relationships which are induced in the geometry. To grasp the nature of this subtle structure fully, we must learn to avoid the danger of trying to see centers made up of parts. Present-day conventional wisdom (perhaps Cartesian and mechanistic in origin) tells us that everything is made of parts. In particular, people believe today that every whole is made of parts. The key aspect of this belief is the idea that the parts come "before" the whole: in short, the parts exist as elements of some kind, which are then brought into relationship with one another, or combined, and a center is "created" out of these parts and their combinations as a result.

I believe accurate understanding of wholeness is quite different. When we understand what wholeness is really like as a structure, we see that in most cases it is the wholeness which *creates* its parts. The center is not made *from* parts. Rather, it would be more true to say that most of the parts are created *by* the wholeness. They settle out from the wholeness, and are created by all of it. This is analogous to the way a



Two dots, Case 1: The addition of a second dot to the one-dot configuration immediately creates an entirely different wholeness, in which something like a head appears above and around the two dots.



Two dots, Case 2: When the second dot is added in a different position, an entirely different configuration makes its appearance. This configuration includes a major diagonal center, and two triangular centers in the top left and bottom right of the rectangle.



The diagonal is not an element or part: it is a center which is generated in the wholeness.

whirlpool is created in a stream. The stream whirls, and the centers we see as the whirling (vortex, stream-lines, etc.) are created by the larger configuration of banks, rocks, and so forth. So, within this whirling, we observe a whirlpool which has formed. This is fundamentally different from the idea that wholes are made up from elements or built from parts.

We may see the phenomenon as I believe it to be in the two-dot examples, where the visible things that look like parts are *induced* by the whole. Thus the visible diagonal in the second case of two dots is something we might call one of its "parts." But it is not a pre-existing *element*. It is a part which is induced by the action of the whole. It "breaks out" naturally from the whole. In no sense at all is it an element from which the center is built.

When we understand things in their wholeness, this is the general rule. The sub-wholes — or centers — are induced within the wholeness, and come *from* the wholeness. And because of this, the parts are adapted and modified, in shape and size, by their position within the whole. The petals of a flower are not identical. They are similar, but each one is slightly different according to its position and history in the whole. When parts repeat we never have identical repetition. Instead we have repeated parts as centers which are changing and variable according to their position in the whole, as they repeat within the whole. In nature, this follows directly from the fact that parts are induced by the whole and created by the whole. The whole is not created out of them. The flower is not made *from* petals. The petals are made from their role and



A whirlpool in ocean water: the center is not an element: it forms within the wholeness.

position in the flower. This is an entirely different vision of reality from the one we have become used to. In this new vision, it is always the whole, the wholeness as a structure, which comes first.

Everything else follows from this wholeness, and from the centers and sub-centers which are induced within it.



7 / A FURTHER EXAMPLE OF WHOLENESS AS IT IS CAPTURED BY THE SYSTEM OF CENTERS

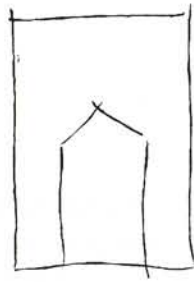
I hope the wholeness, *W*, as I have defined it, actually is beginning to capture that character we intuitively think of as "the whole."

Consider these two drawings of arches, A and B. The drawings are superficially somewhat similar, but the feeling they have is very different. We are aware, if we pay attention, that as *wholes*, they have a pronounced and different gestalt.

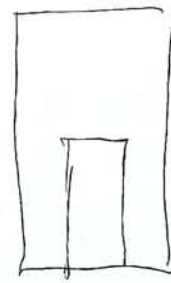
"A" has an arch form, a marked center in the middle at the point of the arch, and an overall coherence. "B" is a simpler, rectangular version of the same thing. But the difference is greater

than these words suggest. The two really have extremely different *character*.

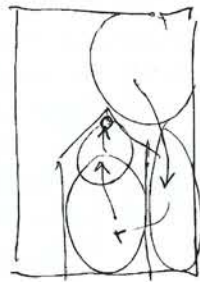
If we focus on the space as a whole, we see how different they are. The pointed one, A, has a focus on the point of the arch. It is united. One sees two wedge-shaped swaths of space to the left and to the right, emphasizing the way the sharp point almost cleaves the space above. The point is also very strongly marked. The second arch, B, is much more blunt. The main thing one is aware of is the stillness of the large square of empty space above the arch. The top of the arch, chisel shaped, is also still. One sees the two legs



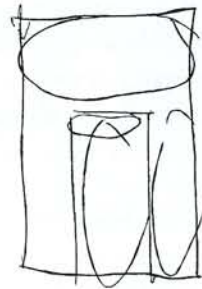
Drawing A



Drawing B



Structure of A, showing the main centers of which it is made.



Structure of B, showing the main centers of which it is made.

on either side as appendages. All this is what we mean by the "wholeness" of the two drawings.

DRAWING A. In the drawing labeled "Structure of A," I have outlined the most salient centers which appear within the space of the drawing and form the wholeness *W*. We can see that the centers I have marked form a kind of nested sequence. There is one at the vertex. There is another which is the triangle of space below the vertex that includes the vertex. There is another which is the whole arch. On the right and left of the arch, there are yet other upside-down trapezium-shaped wedges of space. Then there is a kind of rectangle of space next to the arch on each side of the arch.

Together these visible centers form a kind of swooping movement which starts at the top of the drawing, goes down either side, and then comes up the middle, culminating in the point of the arch. They form a nested structure, which emphasizes the point of the arch and supports the entity that *is* the arch. The wholeness that we experience — the overall gestalt of the whole thing — is precisely captured by the structure *W*.

DRAWING B. In the drawing labeled "Structure of B," I have again outlined the strongest centers which appear to form *its* wholeness. In this case the centers form a somewhat less coherent structure than in A. There is one center in the rectangle at the top, across the top. There is another down each side. There is one center in the arch. These centers fit together in a fashion that roughly resembles the structure of the centers in drawing A, but it is a different structure. For example in B the rectangle across the top is stronger and far more dominant than it is in A. The centers inside the arch are less nested and less dominant than in A. An overall structure exists in B as it does in A, but appears to be less coherent, less bound together.

In both drawings, the system of centers describes the wholeness we intuitively experience in the thing. And we have a hint of the way the wholeness *W* also begins to describe, and explain, the difference in life between the two drawings. A has more life than B, even if only slightly, and we find this fact reflected in the more coherent structure of its wholeness.



8 / THE FUNDAMENTAL ENTITIES OF WHICH THE WORLD IS MADE

Let us move on, now, to consider the appearance of the wholeness *W* in real world examples.

In the foregoing examples we saw how the wholeness of each drawing — the broad sweep of the thing — may be seen as the pattern of the main centers which exist in the space of the drawing. In the arch drawing, the centers are the plain and simple swaths of space and the special bits which stand out, like the apex of the arch or the point where the line of the arch meets the uprights. When we take these centers together, we see how they form themselves into still larger centers — the sweep of the arch, the symmetrical system over the point of the arch, and so on — and that it is then the pattern of all these centers working together which forms the whole.

What exactly, then, *is* wholeness? That is the crux of the matter. My answer is that the wholeness is not merely a way of focusing on the gestalt of the thing, but is instead a real structure, an actual “thing” in itself. It is a structure which exists in the world that includes what we intuitively perceive as the gestalt, the overview, the *broad* nature of a thing. It is the source of the coherence which exists in any part of the world.

This wholeness gets its strength from the coherent spatial centers of which it is made. If there are roses around a front door of a cottage, that is what you remember; if there is a pair of ducks in the garden, and a fishpond, it is the ducks and fishpond you remember; if there is a great and wonderful room with mattresses where everybody sleeps — as in an Austrian mountain hut — then that is what you remember. The roses, the ducks, and the mattresses are all centers, and it is these entities or centers which mark something as what it is, which make it memorable, remarkable.

The coherent centers define character, and create arrangement. The main coherent centers which exist in a place determine what it is like

there, what kind of life it has. The centers are the most fundamental things we notice in what is happening. They affect us most. And this importance of the coherent centers, as the entities which govern the character of a thing, appears on a more physical level too. If a building has a room with an enormous gilded ceiling, it is that ceiling we remember. If the room has immense windows with hundreds of panes looking toward the soft east light, it is those windows we remember. The Stefansdom in Vienna has a huge eagle on the roof. It is the roof we remember, and the huge eagle on it. If one building has columns which are blank concrete shafts, and another has capitals, with a wonderful shape, painted and round, it is these capitals we remember. If a building has a skating rink outside, like Rockefeller Plaza in New York, it is the skating and the skaters we remember.

These are the explicit, obvious centers. And they are not only spatial. Other centers, some hidden, some hardly visible in the space, but latent, or biological, or social, also control the behavior of the world. The arrangement, shape, and pattern of buildings, rooms, streets, and furniture come from the centers again. That which we commonly call “arrangement” — as in the simple example of the two arches in drawings A and B — is also created by centers. Even shape is dominated by the centers and sub-centers which form it. A cross is created by one center at the crossing point, four centers at the extremities, with their larger centers formed by their overlapping relationships to one another. A circle is created by a continuous system of identical centers forming short arcs around the perimeter, neighboring ones overlapping each other and coming back to join themselves, with larger centers in the void of the circle to form the core.

The wholeness of any portion of the world is this system of larger and smaller centers, in



Cottage with roses: its character is given by its dominant centers, the roses, the arch of roses, the timber frame, the plaster squares.

their connection and overlap. The wholeness of a window includes the coherent space which binds the window together—its sill, glass, the sloping reveals, its mullions, the landscape outside, the light coming in, the soft light on the wall next to the window, the chair drawn up toward the window's light—and the formation of larger centers which makes them one: the space of the window seat which binds the window reveals, seat, sill, and window plane; the view which combines chair, outdoor landscape, and the glazing bars; the light falling on the window reveal and on the floor. Here, as before, the wholeness is defined by the major centers—entities—and the way these centers are arranged to form still larger centers. Some centers are explicit. Like the dot, which we

see easily; others, like the space around the dot, we see with more difficulty, because it is more subtle. In the photograph on this page, the cottage is given its character partly by the explicit and obvious centers—the roses, the arched trellis on which the roses climb, the surface of the roof, the individual tiles which form that surface. And, partly, it is given its character by the less visible centers, formed and induced within the wholeness—the “hole” of the archway beneath the trellis, the space in front of the cottage wall, the line in space which connects the archway to the small window in the cottage wall. All the centers together, explicit ones and hidden ones together, form the wholeness in this cottage, as they do in any given part of the world at any moment.

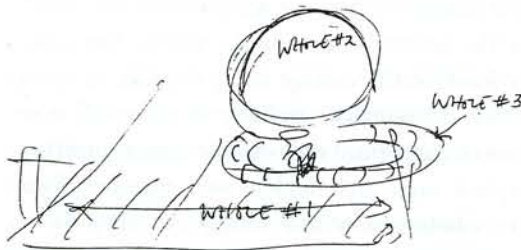


9 / THE SUBTLETY OF CENTERS WHICH EXIST IN THE WORLD

Let us now consider a further example of the subtle wholeness as it appears in the real world. Look at the scene in the photograph on the right. We see a tree, a road, and a bicycle parked at the edge of the road under the tree. In our normal way of looking at this scene, we see various fragments which seem to be "parts" of the whole: the tree, the road, the bike, the cyclist.

Learning to see the wholeness as it is in a case like this, not muddled or contaminated by words and concepts, is *extremely* difficult, but it is possible to learn, consciously, to pay attention to this wholeness. (The difficulty is discussed at some length in appendix 3, where I also give one example of a technique for helping a person see wholeness as it is.¹⁵)

When we see wholeness as it is, we recognize that these seeming parts—the road, the tree, the bike, these particular centers—are merely arbitrary fragments which our minds have been directed to, because we happen to have *words* for them. If we open our eyes wide, and look at the scene without cognitive prejudice, we see something quite different: a great swath of space, wider than the road, which extends to the distance and includes the flat land on either side of the road as one of the major centers in the scene (center #1 in the diagram). We see a space under the tree, between the road and the tree, as another obvious "place" or center within the scene. We see the spot where the



Three of the real centers of which this scene is made

person is leaning, on the right side of the tree, as a major point of concentration. Also, if we look carefully, we see a flat, ring-shaped swath of space under the tree, almost like a flat cylindrical donut, caused by the fact that the tree's foliage has been trimmed to just above head height all around (center #2 in the diagram). And we see the top of the tree, the wooly, beehive shape of the tree itself—but it is not the *tree* which draws our attention as an entity—it is the top of the tree without the trunk—the mass of foliage (center #3 in the diagram). Thus the centers we see, when we look for wholeness, are not the centers which are captured by words, like "road," "bike," and "tree," but a different set of centers, which have no special words attached to them, *and which are induced structurally by the overall configuration of this scene.*

The wholeness of this scene is created by these centers, all of them together. They are *really* there, actually existing centers in the space. It is not our imagination, and not some conceptual occurrence. Their existence and their strength becomes visible when we make our minds blank and look without focusing at all parts of the page at once. In this unfocused or defocused state, we see the big swath of space over grass and road, we see the cotton-wool top of the tree, we see the trunk and the ring of space around it as the strongest things. The things which have easy names—the tree, the bike, the road (though they too have their relative degree of wholeness and centeredness) are less strong within the overall configuration. They are centers, too, but they are lesser centers within this configuration, and play a less important role within the structure as a whole.

For example, why does the rider of the bike put his bike under this tree? What invites him to stop, what invites the bike to be there at all,



A tree, a road, a bicycle, and a cyclist

is the donut of space under the tree, not the tree itself. Thus the wholeness and its real system of centers, hidden and not-hidden, are the structures which have impact on the world. We shall not understand how the world works un-

less we pay attention to the structure of wholeness as it is.

Consider, from this enlarged perspective, a rather more complex case: my family's garden in West Sussex, England. What is most noticeable

about the garden is the way it has life. The ducks come up from the pond, following one another, to the gate. The plum tree is on the sheep meadow. The tennis court, at one corner of the garden, is shielded by rows of apple trees, heavily laden with fruit. In the main flower border the roses bloom; the driveway comes up to the house between nettles and hawthorn hedges. The cats bring the rabbits they catch, and leave the innards of the rabbits on the back terrace. The meadow by the stream floods in the winter, and the following spring the meadow is thick with flowers.

What makes this a living structure is its wholeness. And what exactly is its wholeness? It is the white-washed brick house, standing four-square and simple, unadorned in the field. It is the huge kitchen, the largest room, lit on two sides by garden windows, with a big warm stove warming the kitchen constantly as it heats the hot water; the kitchen table, long, with eight rush chairs around it; the hallway, generous, uncluttered, a room in itself that you enter as you come into the house. The centers which make this farmhouse

what it is, and the life which occurs in the farmhouse, are inseparable. It is the centers which create its behavior, its nature, its substance.

Although one may be misled into thinking about design, the features which design seems to deal with are minor, have less importance. The centers — the coherent entities which form the whole — are life-affirming, massive in their effect, and tremendously concrete, so that minor changes in design could not sway them, or upset them, or change them.

For example: the duck pond, surrounded by the pasture on one side, by the chicken run, with the small seat on one side and the island where the ducks go to escape the fox at night. All these are the effective centers, which make the life of the ducks at the farm.

For example: the stone terrace outside the kitchen, leading out onto the lawn, with the cat door in it. It is the place where we sit, go out to cut flowers in the rose beds just beyond. The flagstones which form this center have an enormous role in the active life of the house.



The garden of Meadow Lodge in West Sussex

In the wholeness of this garden, we find that, once again, it is the *real* centers — the most coherent centers as they actually are, not those which happen to have convenient names — which dominate the feeling and behavior of the place.

Consider the wholeness of the building and the lane together. Suppose there is a garden in front. Perhaps there is a porch, a stone platform at the door, flowers in the garden, a hedge along the lane, and at the back of the garden the wall of the house itself, windows in that wall, a roofline — and so on.

What does it mean to see all this from the point of view of wholeness? I notice the sunny part of the garden itself as a space. The place where the roses are climbing near the kitchen catches my eye. The path to the front door, and the steps from the back porch, and the door itself, the door of the house, all work as a unit, as a continuous center about 40 feet long. The sunshine and the roof edge, with the rafters repeating under the eave, together form a pattern of light and shadow which leads my eye, and forms a boundary of the house against the sky. Perhaps there is a reflection from one of the windows. The window and its curtains form a frame for what I see behind in the darkness of the room.

All this is much more like a pulsating unity than the “conceptual” or intellectual image of the house. In our conceptual picture of the house, we have things called street, garden, roof, front door, and so on. But the centers or entities which hit my eye when I take it all in as a whole are slightly different. I see the sunny part of the garden where the sun is falling on the lawn as a center — not the entire “garden.” I see the swath of space which unites front steps, front path, and front stoop, not the “front door.” I see the roofline and the light and shadow of the eave, not the “roof” as such. Also there is a thing which I might call “garden-plus-street” — a center where the flowerbed meets the street. This is

entirely different from the conceptual and verbal entity “street” or the conceptual and verbal entity “house.” It straddles conceptual boundaries.

The difference is deeply functional, not just a matter of visual perception. The centers we see when we look at the thing in its wholeness are the ones which are responsible for its real behavior. For example, it is the sunny part of the garden which makes a difference to the way the garden really works, not the abstract or conceptual entity marked “garden” that is bounded by the house and the fence. It is the swath of space going from the front gate, over gravel, past the roses to the front door which actually controls the way we feel as we approach the house and enter it — not the conceptual entity “front door.” It is the bit of land where garden lawn meets fence and field where the sheep graze, backed up by the willow over the lawn, where we often pull our chairs in the shade, that allows us to sit there drinking our tea, watching the world go by — and this affects the life and feeling of the house in its relation to the world much more substantially than any characteristic of the abstract entity we call the “garden.”

Thus the centers we notice when we see the situation in its wholeness are not only more dominant to the eye. *They control the real behavior of the thing, the life which develops there, the real human events which happen, and the feelings people have about living there.* The house-garden complex seen in its wholeness is truer perceptually and more accurate functionally than any analytic vision of the house or lot or garden taken by themselves.

It is apparent, if we think carefully, that we are not used to seeing — or looking at — this kind of structure in the world around us. If we consider a garden and a house from this point of view, the deep centers hidden in the house and the garden are unexpected, just as they are in the sheet of paper with a dot. They are subtle, perhaps invisible to a casual observer. Yet it is these centers and their structure which give the thing its life.



10 / WHOLENESS AS A FUNDAMENTAL STRUCTURE

Everything that follows in this book is a view of physical reality dominated by the existence of wholeness as I have defined it.

I propose a view of physical reality which is dominated by the existence of this one particular structure, W, the wholeness. In any given region of space, some subregions have higher intensity as centers, others have less. Many subregions have weak intensity or none at all. The overall configuration of the nested centers, together with their relative intensities, comprise a single structure. I define this structure as "the" wholeness of that region.¹⁶

This structure exists everywhere in the world. It exists in nature; it exists in buildings; it exists in works of art. It is a fundamental structure in space which not only encompasses the wholeness or gestalt of the thing; it also encompasses the obvious parts, or elements, from which this thing is made.¹⁷

I am firmly convinced that the nature and behavior of buildings and other artifacts can only be understood within the context of this

structure. In particular, objective recognition of the fact that some buildings have more life than others, and are objectively more beautiful and satisfying, can only—I think—be achieved in the context of this structure.¹⁸

I believe, too, that life, in an ordinary biological sense, is itself also created from this wholeness: and that efforts to explain it in more mechanical fashion will go on failing, as they have in recent decades.

A crucial feature of the wholeness is that it is neutral: it simply exists. Determination of its details may be made by neutral methods, yet at the same time—as we shall see in later chapters—the relative harmony or "life" of a given building may be understood directly from the internal cohesion of the structure. Thus, the relative life or beauty or goodness of a given part of the world may be understood, I shall argue, without reference to opinion, prejudice or philosophy, *merely as a consequence of the wholeness which exists.*

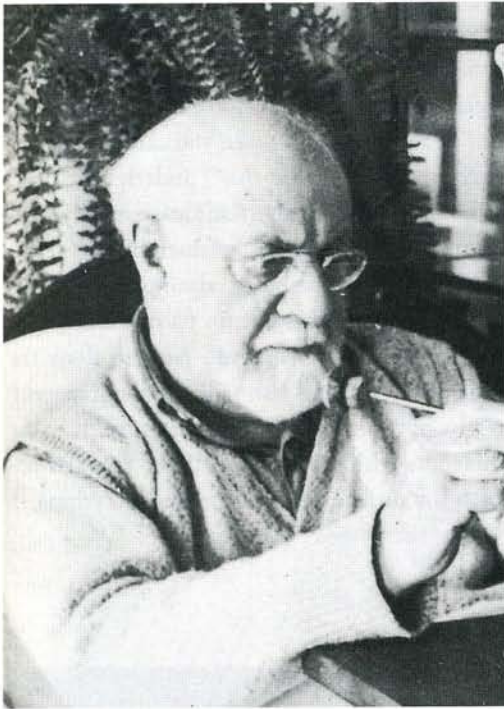


11 / THE GLOBAL CHARACTER OF WHOLENESS

I have not yet emphasized the enormous *power* of the wholeness, *W*. This structure catches the overall character in a way which is almost mysterious, but goes to the heart of many things not easily explained. This happens because it is an overall *field-like* structure, a global, overall effect. It is distinct, completely distinct, from the elements or "parts" which appear in that wholeness; it is unusual in our experience, yet catches what we have often thought of as the artistic intuition about the whole.

I know of no example which makes this more clear than a famous one which appears in an essay on portraiture by Matisse.¹⁹ He talks

about the fact that the character of a human face is something which is deep in the person, deep in the face, and may not be captured by the local *features* in the normal sense at all. To make his point, he shows four drawings he made of his own face. These drawings, reproduced below, are remarkable. The features, in the normal sense, are different in each drawing. In one he has a weak chin, in another a very strong chin. In one he has a huge roman nose, in another a small pudgy nose. In one the eyes are far apart, in another they are close together. And yet, in each of the four faces, we see the unmistakable face and character of Henri Matisse. As Matisse says, the



Matisse in his studio

character is something deeper than features: it is an inner thing which exists over and above the features, and is not even dependent on these features.

What in the world is going on? What is it that Matisse is seeing? How is it that we see Matisse's face, in each case, even though the features are so entirely different? What is this elusive "character" in a person's face which Matisse can see so well, and which we fail to see as clearly?

The answer is, this "character" is the wholeness. It is the overall vector, the overall qualitative structure, the overall field effect of the face. It is a global pattern-like aspect of the face which is the same in all four pictures. How should I describe this wholeness? It is the bald head with the eyes and with the eyes spreading concentrating downward, coming to a point somewhere around the mouth. Also the lower part, mustache, jaw, etc., somehow spreads outward again. We do not



Four different self-portraits of Matisse: the features are different in each case; only the wholeness remains the same in every drawing.

have an easy language for describing this kind of overall structure. But it is indeed this overall structure of the centers that is responsible for the wholeness. And, as far as this is concerned, it is the *same* in all four drawings. And it is the same, too, of course, in the photo of Matisse — because that is actually what was *in his face*. The wholeness of this face is that thing which is common to all four drawings, and includes none of that which is different in the four drawings. Thus the drawings accurately reflect the wholeness of Matisse's actual face, even though this wholeness is produced in conjunction with local features which vary enormously.

This definition makes it clear how much the wholeness is a global thing — easy to feel, perhaps, but hard to define. You cannot get the portrait of a person right *unless* you can see this underlying wholeness, this underlying inner character. Drawing the features correctly does not necessarily achieve a resemblance. How many artists, in their first attempts at portraiture, have found this out, in frustration? If you want to draw a person, you *have* to draw the wholeness. Nothing else will get the likeness.²⁰

In portraiture, as in architecture, it is the wholeness which is the real thing that lies beneath the surface, and determines everything.



12 / WHOLENESS AS A FUNDAMENTAL PART OF PHYSICS

The vital part played by wholeness as the fundamental substratum that governs the behavior of the world extends far beyond architecture and art. Even in modern physics, the “toughest” of the sciences, revolutionary experiments made during the 20th century have indicated that the most mechanical events — for example the path taken by an electron flying through a geometric pattern of slits — are also governed by the wholeness of that field, not only by the classical forces acting on the electron.

One of the most puzzling experiments of the 20th century is the two-slit experiment. In this experiment, electrons pass through a pair of slits, and then land on a wall: the experiment counts the electrons arriving at different positions on the screen. What has been shown conclusively is that the pattern of electrons arriving on the wall cannot be explained by the normal classical picture of mechanical forces acting on the electron.

Physics has concluded that, in some way, the electron is guided by the wholeness of the experimental configuration.²¹ The mathematics is well understood. But the physical interpretation is

not understood, even to this day. Although the analysis and interpretation of the way wholeness should be understood has not yet been agreed upon, there are strong reasons for thinking that the wholeness which causes the motion of the electron is essentially the same wholeness we have already defined: the system of centers created by the spatial configuration of the experiment.²² What is most remarkable is that it appears that this wholeness influences the movement of electrons in a way that exists over and above any mechanical effects caused by electromagnetic fields and conventional nuclear forces. Thus the wholeness has a fundamental part to play in governing the behavior of matter.

Further details of this experiment, and its interpretation in terms of wholeness, are given in appendix 5. *But the essential point for the reader is to recognize that the wholeness, defined as the pattern of centers in some part of space, is not only the underlying causative structure in matters of architecture and art — but that even the behavior of subatomic particles, electrons, is also governed by this wholeness. Wholeness is a truly pervasive structure, which acts at all scales.*

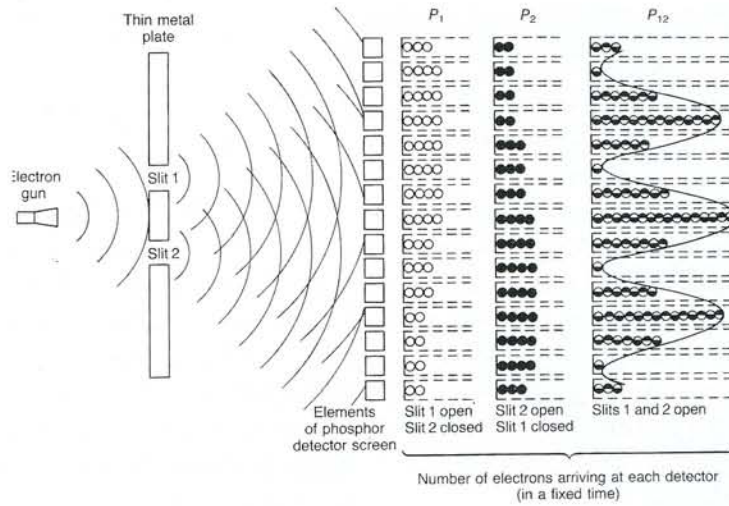
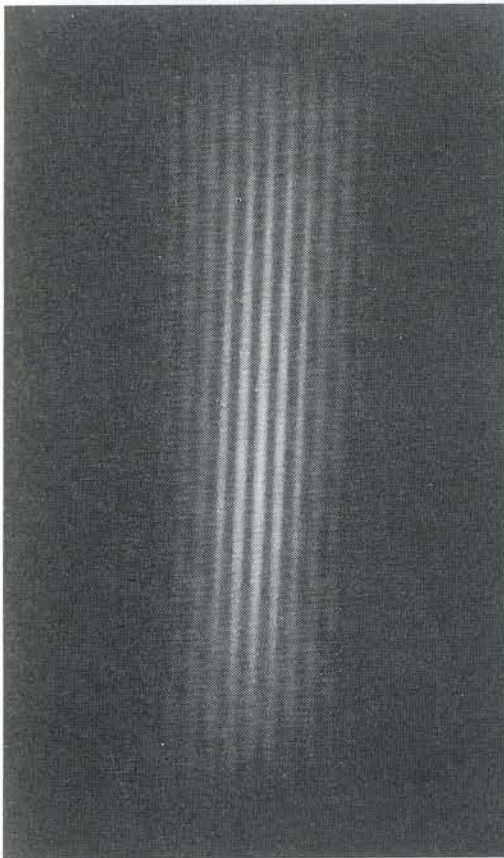
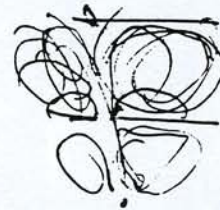


Diagram of the electrons passing through the slits

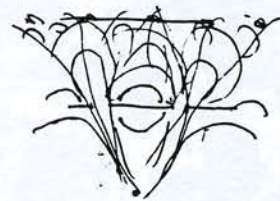


Interference fringes made by electrons hitting a wall in the two-slit experiment

In appendix 2 and appendix 3, and above all in appendix 6, I give other examples of the power which the wholeness, W , has to explain hitherto unexplained phenomena, because it emphasizes, and makes concrete, the wholeness that is really there.



The wholeness of the one-slit experiment



The wholeness of the two-slit experiment



13 / WHOLENESS AS THE UNDERLYING SUBSTRATE
OF ALL LIFE IN SPACE

Seeing the power of the wholeness in matters of psychology, and art, and physics, we get some inkling of its potential. I believe that it holds the key to much of what happens in the world, and certainly the key to what happens in buildings, their effect on us, their life. The real character of the world, its flesh, is governed by the centers in the geometry.

Look at the street illustrated in the picture below. What is the origin of its life at this moment, the basis of its nature? It is the pattern of hydrants on the sidewalk and the centers which they form, the centers formed by the front steps and windows together with the street. These things do not have names, but once again it is the wholeness from which its life originates. It is the



Children playing in a city street, in the summer heat. The fire hydrants and the spray they create, stoops, stairs, sidewalk, knots of children — these centers create the situation.



A mysterious interior in the Middle East. Beckoning women, the light falling in the room beyond, patterns on the floor and walls—these are the centers which create this atmosphere.

particular system of centers, peculiar to this street, and the life which emanates from them.

Similarly, even the strange mood of these rooms in the Middle East, haunting, perhaps a brothel, perhaps a harem—depends entirely on its centers. The dark-eyed women, veils, heavily patterned wallpaper, rooms, and doorways leading on—this mood is formed by the centers.

In traditional Japan, there is a small garden, a bridge, tatami mats on the floor, a sliding

screen, paper on the sliding screen. These centers are particular to traditional Japan. In India people are comfortable sitting on the ground, even in a public railroad station, because they view their ownership of the ground in another way unfamiliar in the West; to them, all ground is really theirs to use as they wish.

Such centers, each typical for its culture, are carried by culture, and define centers in society and in the built world. Thus one cultural fact of



Indian scene, formed by its centers, the loose aggregation of space, the trees spaced apart, the flowing saris and the space which they create

India exists in the fact that there are some centers made of people sitting and lying on the ground, in railway stations, others carry the same feeling even into a forest as in the scene above. These are peculiarities of India. The two Indian scenes il-

lustrated are formed by such centers: on the next page, people sitting and lying in a public place during a storytelling episode; above, in the forest, the loose aggregation of space, the trees spaced apart, the flowing saris and the space



The centers formed in a scene in India

which they create. This is one of the myriad things which give India its special substance and character.

In human society, the wholeness of a given part of space always includes the cultural milieu. In India, the wholeness includes the pervasive existence of centers in which people sit, squat, sleep on the ground. In America this would be an aberration, for which a person might be arrested.

All this depends on the wholeness, W, and its particular state in various parts of the world. W—that is, the particular system of centers—governs and defines the cultural variation which we experience in the world.

In a large building, consider the organization: approach, gardens, entrance, main rooms, main structure, doors, windows, ceilings, stairs, the character of the movement from room to room, the character of space in any given room—all this is given by centers. And the life that happens there—the social life, the gather-



Hagia Sophia, Istanbul: the sunbeams are essential centers in the wholeness.



Centers formed during a secret and intimate discussion

ings, meetings, the private conversations, individual workplaces, the place to sit, the meals, the welcoming, and leave-taking — all this too, is embodied in the centers of the building.

Look at the interior of the Hagia Sophia, on the previous page. One system of coherent entities we observe are the light rays. These centers are changing — as the sun moves, so the light rays move. The centers which appear and disappear are evanescent, impermanent, in flux. Further, the homogeneity which forms these centers is subtle. Here the material, which is air, is continuous throughout the space. But some dust particles floating in the air catch the light, so it is these lit dust particles that form the ray and, of course, the actual waves of light, which pass through the air and illuminate the space. This example broadens our idea of architecture, because we recognize that these kinds of transitory event-like centers play as huge a role in the way a building is and works as the more obviously fixed elements like columns and floors.

Consider another case. Two boys, whispering, talking about their secrets, in a shed. Here



The fervent kiss: an entity that forms for one instant



The growing embryo forms a center in the woman's belly.

again we have a situation which is of the essence of architecture. It is this moment, long remembered — unconsciously if not explicitly — which makes the magic of those years, and it is this shed, able to nurture those private conversations, which is a living part of the world. In this case, *what* are the centers? They are even more evanescent than the sunbeams. It is the human situation, the two boys together: it may last five mi-

nutes, then fall apart. It is a human association, a living moment, which existed at that moment when the photograph was taken, and is now gone forever. It may have recurred, in slightly different form, hundreds of times. But again, the centers which form when these boys talk together, which is *this* association between the boys, is essential to a proper understanding of architecture: here we have a case which is almost purely human.

Finally we may consider even less architectural cases: the pregnant woman, with the baby in her belly; the young man kissing the hand of the priest; the players of some string quartet, playing, sitting together, looking at their music on the music stands, making the violins sing. It is the swollen belly and the child within; the fervent kiss; the sound and motion of the violin players — these centers again are the real stuff of which the world is made, in our experience, in its emergent actuality. A gathered fistful of flowers, pushed into a jam-jar, then set upon a table — this is a center which gives the afternoon its meaning.

Are these several very different kinds of centers all of one kind? And is it reasonable, fair, accurate, to speak of a kind of wholeness which

embraces all of them together? For reasons that are explained more fully in chapter 11, I believe that *all* centers that appear in space — whether they originate in biology, in physical forces, in pure geometry, in color — *are* alike simply in that they all animate space. It is this animated space that has its functional effect upon the world, that determines the way things work, that governs the presence of harmony and life.

But it is no small thing to see the world like this: a unitary source of organization, all of it anchored in space, with space *itself* the stuff that comes alive. That is the enigma. But it is also that which forms the effective substrate of the view I am presenting here, which gives us the possibility of understanding life at all.



14 / LIFE COMES DIRECTLY FROM THE WHOLENESS

The essence of the wholeness, as I have defined it, is neutral: it simply exists.

At each place in the world — with its natural habitat, ecology, buildings, materials, actions, and events — there is, at any instant, some given wholeness; that is, some definite, well-defined system of centers that creates the organization of that part of the world. And the wholeness always exists in some form, whether that place is good or bad, lifeless or alive.

But we shall see next that the *degree* of life which exists at that place and time also comes *from* the wholeness, and only from the wholeness. The neutral wholeness spawns characteristics which are far from neutral — characteristics which indeed go to the very origin of right and wrong. As we shall see in the next chapter, the life which occurs is specifically dependent on the

system of centers, and the degree of life, the intensity of life, arises from the wholeness. Whether it is an apple-orchard, a dining-room, a harem, a dung heap in the garden, a painting, the wall of a building with its windows, the glaze of an earthenware pot, or the fervent kiss of a boy — in *every* case, the life which that thing has arises from its wholeness.

So — this neutral wholeness, which lies under the surface of every place, at every time, in buildings, meadows, streets — is the natural origin of life. Life comes *from* it. Life comes from the particular details of the ways the centers in the wholeness cohere to form a unity, the ways they interact, and interlock, and influence each other. The academic and difficult task of grasping the nature of this wholeness will pay us back, by giving us the origin of life.

NOTES

1. The general idea of wholeness, or relative wholeness, as *the* fundamental primitive, has been discussed by many authors, for example Jan Christian Smuts, *HOLISM AND EVOLUTION* (London: Macmillan, 1926); Wolfgang Köhler, *GESTALT PSYCHOLOGY* (New York: Liveright, 1929) and *THE PLACE OF VALUE IN A WORLD OF FACTS* (New York: Liveright, 1938); Kurt Koffka, *PRINCIPLES OF GESTALT PSYCHOLOGY* (London: Routledge & Kegan Paul, 1955); Gregory Bateson, *MIND AND NATURE: A NECESSARY UNITY* (New York: Dutton, 1979). It has been discussed most notably perhaps by Whitehead in *PROCESS AND REALITY, AN ESSAY IN COSMOLOGY* (Cambridge: The University Press, 1929).

2. For example, John Wheeler and Wojciech Zurek, *QUANTUM THEORY AND MEASUREMENT* (Princeton, N.J.: Princeton University Press, 1983); or David Bohm, *QUANTUM THEORY* (New York: Prentice-Hall, 1951).

3. For example, Charles Misner, Kip Thorne, John Wheeler, *GRAVITATION* (San Francisco: Freeman, 1975).

4. A piece of tissue, transplanted from a newt's eye, if transplanted to the tail, becomes a tail. A piece of growing tail, transplanted to the eye, becomes an eye. It is the larger configuration which determines the destiny of the growing material, not its local or internal structure. See H. Spemann, "Experimentelle Forschungen zum Determinations- und Individualitätsproblem," *NATURWISSENSCHAFT* 7 (1919), described in Ludwig von Bertalanffy, *MODERN THEORIES OF DEVELOPMENT* (New York: Harper & Brothers, 1962), 121-22.

5. No one spot in the brain holds a particular memory. Each memory is suffused throughout the brain, and is apparently global, not local. Karl Lashley, "In Search of the En-gram," *PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY* 4 (1950): 454-82, reprinted in F. A. Beach, D. O. Hebb and C. T. Morgan, *THE NEUROPSYCHOLOGY OF LASHLEY* (New York, 1960).

6. See J. S. Haldane, *THE LUNG AND THE ATMOSPHERE AS A SINGLE SYSTEM IN ANIMAL BIOLOGY* (Oxford, 1927).

7. Ernst Mach, *DIE MECHANIK IN IHRER ENTWICKLUNG HISTORISCH-KRITISCH DARGESTELLT* (Leipzig: Brockhaus, 1912).

8. James Lovelock, *GAIA* (Oxford: Oxford University Press, 1979).

9. The wholeness *W* is fully defined in mathematical terms in appendix 1.

10. More detailed study of the geometrical and structural factors which make segments of space function as centers is given in chapter 5. In the literature the definition of these features which cause centers to stand out or "settle out" has, in the past, usually been thought of as psychological, and the study of these features has usually been considered as a branch of cognitive psychology. The fact that the level of wholeness of different centers is objectively given, and may in principle be determined, was described by the gestalt psychologists Max Wertheimer, Wolfgang Köhler and Kurt Koffka, who formulated the laws of "prägnanz" as the determining features of a

whole, which gives it its strength. See Wolfgang Köhler, *GESTALT PSYCHOLOGY* (London: G. Bell and Sons, 1929); Kurt Koffka, *PRINCIPLES OF GESTALT PSYCHOLOGY* (New York: Harcourt, Brace, 1935). One of the most detailed accounts was given by Marian Hubbell Mowatt, "Configurational Properties Considered Good by Naive Subjects," *AMERICAN JOURNAL OF PSYCHOLOGY* 53 (1940): 46-69, reprinted in David Beardslee and Michael Wertheimer, *READINGS IN PERCEPTION* (New York: Van Nostrand, 1958), 171-87.

11. Entities appear in the world because different parts of space have different levels of coherence. In ancient times, one of the first writers to notice this explicitly was Chuang-tzu, who saw how the order of a piece of meat depended on the fact that some pieces were more knit together than others, and that "understanding" anything in the world consisted of grasping correctly the way that thing could be divided into pieces which are relatively more or less coherent. The butcher who hacks at his meat blunts his knife quickly. But the butcher who has attained wisdom presses his knife into the soft spots, the crevices of the meat, and almost makes the meat fall apart according to its own structure. This butcher keeps his knife sharp for a hundred years. The image of this butcher who sees the world as it really is, is fundamental to all Taoist texts. In modern times, the importance of coherence, and the relative coherence or wholeness of different entities, was first studied by Köhler and Wertheimer — who described the ways that collections of dots form groupings, and that some groups are more coherent than others. They formulated this idea as the laws of "prägnanz," or laws of coherence, which was their first attempt to state the laws which created relatively more and less coherence in different parts of space. See Köhler, *GESTALT PSYCHOLOGY*.

12. For years, I struggled with the idea that everything — all form — was made of entities. I first struggled with it in a lost manuscript, *THE UNIVERSE OF FORMS* (a manuscript written 1965-1967, and then unfortunately burned, without any copy being preserved). I had formulated a theory in which I tried to show how all order and all form could be understood by building things up from the coherent wholes which appear in space. Years later, in 1970-1975, I came back to the same ideas and struggled with them again in *THE TIMELESS WAY OF BUILDING AND A PATTERN LANGUAGE*. In these books I showed how the significant relationships which appear in buildings are all patterns of wholes, and that once again it is the entities *themselves* which play the fundamental role. Alfred North Whitehead had formulated similar notions of "organisms" (his word for entities) early in this century. However, my attempt to catch the solidity of these entities as the fundamental elements of order never really came out right; it never worked as the fundamental notion. I began trying to get this straight in the later versions of *A PATTERN LANGUAGE*, where I noticed that even the entities which formed a pattern were in effect patterns, too, so that properly a pattern was not

a pattern of entities, but a pattern of patterns. This brought the entity concept into doubt by stressing the fact that the things which appeared to be entities were fluid, not fixed, not bounded, not really "things" at all. All this finally became clear to me about ten years ago when I finally understood that all these troublesome entities, which were so important as the building blocks of nature, were not truly bounded entities but were in fact non-bounded centers: Centers of influence, centers of action, centers of other centers — centers of *some* kind, appearing in the seething mass of the wholeness. About fifteen years ago, I finally realized that this way of looking at things was logically consistent, solved all the earlier problems of "entities," and was a solid footing on which a theory of order could properly be built.

13. One book which discusses the idea of centers in a fashion that has some kinship to my discussion here is Rudolf Arnheim, *THE POWER OF THE CENTER: A STUDY OF COMPOSITION IN THE VISUAL ARTS* (Berkeley: University of California Press, 1982). Another, much earlier work from the 18th century, which tries to establish point centers as the foundation of an all-embracing physics, was Roger Joseph Boscovich, *A THEORY OF NATURAL PHILOSOPHY* (London, 1763; reprinted Cambridge, Mass.: MIT Press, 1966).

14. The theory of fuzzy sets, put forward in topology by Christopher Zeeman "Tolerance Spaces and the Brain," in C. H. Waddington, *TOWARDS A THEORETICAL BIOLOGY* (Chicago: Aldine, 1968), 140-51, makes an attempt to solve this difficulty. However, in my opinion, it does not penetrate to the core of the matter.

15. Here we come back to Chuang-tzu again, and the difficult task of seeing the world as it really is, by seeing the entities in their proper order of saliency, not a distorted one. The same point has also been made forcefully by David Bohm, *FRAGMENTATION AND WHOLENESS* (Jerusalem: The Van Leer Jerusalem Foundation, 1976). See also appendix 3.

16. The structure is defined mathematically in appendix 1.

17. The idea of representing any given pattern as a system of selected coherent sets also appears in the foundations of topology. A particular topology is defined by the way in which the coherent sets are nested. But in this case, the definition of "coherent set" is much

more restricted and less interesting. The fundamental idea expressed in this book is that the levels of coherence of different sets of centers may be continuously variable, and defined by much more subtle criteria. See appendix 1.

18. Concepts presently available to us in mathematics are not yet powerful enough to let us grasp this structure fully. For this reason many of the techniques, tests, and methods which I describe in this book are cognitive. The empirical methods which are described in this book (chapter 9) are the best I have been able to develop to get to grips with the structure.

19. Henri Matisse, "Exactitude Is Not Truth," first published in *HENRI MATISSE: RETROSPECTIVE* (Philadelphia: Philadelphia Museum of Art, 1948), reprinted in Jack D. Flam, *MATISSE ON ART* (New York: Dutton, 1978), 117-19.

20. My understanding of this point has been enlarged very greatly by conversations with my daughter Lily. It was not until she explained it to me, by drawing her own sketches of people and telling me how she saw, and was able to catch, this underlying character in a person, that I really understood this short essay of Matisse, even though I had been studying it for years.

21. A key formulation of this matter was given by Niels Bohr, the father of quantum mechanics, who said that we can only understand the behavior of the electron in this experiment if we understand that, somehow, the electron moves as a function of the entire experimental setup. Niels Bohr, "Discussion with Einstein on Epistemological Problems of Atomic Physics," first published 1924, reprinted in Wheeler and Zurek, eds., *QUANTUM THEORY AND MEASUREMENT* (Princeton, N.J.: Princeton University Press, 1983), 30.

22. One coherent account of this phenomenon, and one which directly approaches the structure I define as the wholeness, is David Bohm's *WHOLENESS AND THE IMPLICATE ORDER* (London: Routledge & Kegan Paul, 1980), where he also describes the underlying structure of space that determines the path of the electron. In a series of meetings between the two of us, held in Ojai, California, in 1988, Bohm told me that he believed what he defines as the implicate order, and what I define as the wholeness, are essentially one and the same thing. This is also discussed more fully in appendix 5.