ON READING THIS BOOK

What lies in this book is perhaps more important as a whole than in its details. If you only have an hour to spend on it, it makes much more sense to read the whole book roughly in that hour, than to read only the first two chapters in detail. For this reason, I have arranged each chapter in such a way that you can read the whole chapter in a couple of minutes, simply by reading the headlines which are in italics. If you read the beginning and end of every chapter, and the italic headlines that lie between them, turning the pages almost as fast as you can, you will be able to get the overall structure of the book in less than an hour.

Then, if you want to go into detail, you will know where to go, but always in the context of the whole.

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THE GATE

12. And, beyond that, it is not just the shape of towns and buildings which comes from pattern languages—it is their quality as well. Even the life and beauty of the most awe-inspiring great religious buildings came from the languages their builders used.

13. But in our time the languages have broken down. Since they are no longer shared, the processes which keep them deep have broken down; and it is therefore virtually impossible for anybody, in our time, to make a building live.

14. To work our way towards a shared and living language once again, we must first learn how to discover patterns which are deep, and capable of generating life.

15. We may then gradually improve these patterns which we share, by testing them against experience: we can determine, very simply, whether these patterns make our surroundings live, or not, by recognizing how they make us feel.

16. Once we have understood how to discover individual patterns which are alive, we may then make a language for ourselves for any building task we face. The structure of the language is created by the network of connections among individual patterns: and the language lives, or not, as a totality, to the degree these patterns form a whole.

THE WAY

life; and the intensity of the result depends on the intensity of each one of these individual steps.

21. From a sequence of these individual patterns, whole buildings with the character of nature will form themselves within your thoughts, as easily as sentences.

22. In the same way, groups of people can conceive their larger public buildings, on the ground, by following a common pattern language, almost as if they had a single mind.

23. Once the buildings are conceived like this, they can be built, directly, from a few simple marks made in the ground—again within a common language, but directly, and without the use of drawings.

24. Next, several acts of building, each one done to repair and magnify the product of the previous acts, will slowly generate a larger and more complex whole than any single act can generate.

25. Finally, within the framework of a common language, millions of individual acts of building will together generate a town which is alive, and whole, and unpredictable, without control. This is the slow emergence of the quality without a name, as if from nothing.

CHAPTER I

THE TIMELESS WAY

It is a process which brings order out of nothing but ourselves; it cannot be attained, but it will happen of its own accord, if we will only let it.

New England house, an Alpine hill village, an ancient Zen temple, a seat by a mountain stream, a courtyard filled with blue and yellow tiles among the earth. What is it they have in common? They are beautiful, ordered, harmonious—yes, all these things. But especially, and what strikes to the heart, they live.

Each one of us wants to be able to bring a building or part of a town to life like this.

It is a fundamental human instinct, as much a part of our desire as the desire for children. It is, quite simply, the desire to make a part of nature, to complete a world which is already made of mountains, streams, snowdrops, and stones, with something made by us, as much a part of nature, and a part of our immediate surroundings.

Each one of us has, somewhere in his heart, the dream to make a living world, a universe.

Those of us who have been trained as architects have this desire perhaps at the very center of our lives: that one day, somewhere, somehow, we shall build one building which is wonderful, beautiful, breathtaking, a place where people can walk and dream for centuries.

In some form, every person has some version of this dream: whoever you are, you may have the dream of one day building a most beautiful house for your family, a garden, a fountain, a fishpond, a big room with soft light, flowers outside and the smell of new grass.

In some less clear fashion, anyone who is concerned

It is not an external method, which can be imposed on things. It is instead a process which lies deep in us: and only needs to be released.

The power to make buildings beautiful lies in each of us already.

It is a core so simple, and so deep, that we are born with it. This is no metaphor. I mean it literally. Imagine the greatest possible beauty and harmony in the world—the most beautiful place that you have ever seen or dreamt of. You have the power to create it, at this very moment, just as you are.

And this power we have is so firmly rooted and coherent in every one of us that once it is liberated, it will allow us, by our individual, unconnected acts, to make a town, without the slightest need for plans, because, like every living process, it is a process which builds order out of nothing.

But as things are, we have so far beset ourselves with rules, and concepts, and ideas of what must be done to make a building or a town alive, that we have become afraid of what will happen naturally, and convinced that we must work within a "system" and with "methods" since without them our surroundings will come tumbling down in chaos.

We are afraid, perhaps, that without images and methods, chaos will break loose; worse still, that unless we use im-

of physics which tells us that all things are equally alive and real.

In physics and chemistry there is no sense in which one system can be more at one with itself than another.

And no sense at all in which what a system "ought to be" grows naturally from "what it is." Take, for example, the atoms which a physicist deals with. An atom is so simple that there is never any question whether it is true to its own nature. Atoms are all true to their own natures; they are all equally real; they simply exist. An atom cannot be more true to itself, or less true to itself. And because physics has concentrated on very simple systems, like atoms, we have been led to believe that what something "is," is an entirely separate question from what it "ought to be"; and that science and ethics can't be mixed.

But the view of the world which physics teaches, powerful and wonderful as it is, is limited by this very blindness.

In the world of complex systems it is not so. Most men are not fully true to their own inner natures or fully "real." In fact, for many people, the effort to become true to themselves is the central problem of life. When you meet a person who is true to himself, you feel at once that he is "more real" than other people are. At the hu-

man level of complexity, then, there is a distinction between systems which are true to their "inner nature," and those which aren't. Not all of us are equally true to our inner nature, or equally real, or equally whole.

And exactly the same is true in those larger systems, outside us, which we call our world. Not all parts of the world are equally true to themselves, equally real, equally whole. In the world of physics, any system which is self-destroying simply ceases to exist. But in the world of complex systems this is not so.

Indeed, this subtle and complex freedom from inner contradictions is just the very quality which makes things live.

In the world of living things, every system can be more real or less real, more true to itself or less true to itself. It cannot become more true to itself by copying any externally imposed criterion of what it ought to be. But it is possible to define a process which will tell you how the system can become more true to itself, in short what it "ought to be," only according to what it is.

This oneness, or the lack of it, is the fundamental quality for any thing. Whether it is in a poem, or a man, or in a building full of people, or in a forest, or a city, everything that matters stems from it. It embodies everything.

Yet still this quality cannot be named.

The fact that this quality cannot be named does not mean that it is vague or imprecise. It is impossible to name because it is unerringly precise. Words fail to capture it because it is much more precise than any word. The quality itself is sharp, exact, with no looseness in it whatsoever. But each word you choose to capture it has fuzzy edges and extensions which blur the central meaning of the quality.

I shall try to show you now, why words can never capture it, by circling round it, through the medium of half a dozen words.

The word which we most often use to talk about the quality without a name is the word "alive."

There is a sense in which the distinction between something alive and something lifeless is much more general, and far more profound, than the distinction between living things and nonliving things, or between life and death. Things which are living may be lifeless; nonliving things may be alive. A man who is walking and talking can be alive; or he can be lifeless. Beethoven's last quartets are alive; so are the waves at the ocean shore; so is a candle flame; a tiger may be more alive, because more in tune with its own inner forces, than a man.

A well-made fire is alive. There is a world of difference between a fire which is a pile of burning logs, and a fire which is made by someone who really understands a fire. He places each log exactly to make the air between

the logs just right. He doesn't stir the logs with a poker, but while they are burning, grasps each one, and places it again, perhaps only an inch from where it was before. The logs are so exactly placed that they form channels for the draft. Waves of liquid yellow flame run up the logs when the draft blows. Each log glows with full intensity. The fire, watched, burns so intensely and so steadily, that when it dies, finally, it burns to nothing; when the last glow dies, there is nothing but a little dust left in the fireplace.

But the very beauty of the word "alive" is just its weakness.

The overwhelming thing that stays with you is that the fire lives. And yet this is a metaphor. Literally, we know that plants and animals are alive, and fire and music are not alive. If we are pressed to explain why we call one fire alive and another dead, then we are at a loss. The metaphor makes us believe that we have found a word to grasp the quality without a name. But we can only use the word to name the quality, when we already understand the quality.

Another word we often use to talk about the quality without a name is "whole."

A thing is whole according to how free it is of inner contradictions. When it is at war with itself, and gives rise to forces which act to tear it down, it is unwhole. The more

CHAPTER 9

THE FLOWER AND THE SEED

This quality in buildings and in towns cannot be made, but only generated, indirectly, by the ordinary actions of the people, just as a flower cannot be made, but only generated from the seed.

mind. It has a thousand billion cells, each one adapted perfectly to its conditions—and this can only happen because the organism is not "made" but generated by a process which allows the gradual adaptation of these cells to happen hour by hour. . . .

It is the process which creates the organism—and it must be so. No thing which lives can possibly be made in any other way.

If you want to make a living flower, you don't build it physically, with tweezers, cell by cell. You grow it from the seed.

Suppose you are trying to create a flower—a new kind of flower. How will you do it? Of course you will not try to build it cell by cell, with tweezers. You know that any attempt to build such a complex and delicate thing directly would lead to nothing. The only flowers which men have built directly, piece by piece, are plastic flowers. If you want to make a living flower, there is only one way to do it—you will have to build a seed for the flower and then let *it*, this seed, generate the flower.

This hinges on a simple scientific proposition: the great complexity of an organic system, which is essential to its life, cannot be created from above directly; it can only be generated indirectly.

The sheer amount of differentiation makes this certain. For instance, in a flower there are more than a billion

cells—each one different. Obviously, no process of construction can ever create this kind of complexity directly. Only those indirect growth processes, in which order multiplies itself, only these kinds of processes can generate this biological complexity.

This cannot happen unless each part is at least partly autonomous, so that it can adapt to the local conditions in the whole.

The quality without a name, like all forms of organic wholeness, depends essentially on the degree of adaptation of the parts within the whole.

In a system which approaches the character of nature, the parts must be adapted with an almost infinite degree of subtlety: and this requires that the process of adaptation be going on through the system, constantly.

It requires that each part at every level, no matter how small, has the power to adapt itself to its own processes.

This cannot happen unless each part is autonomous.

A building which is natural requires the same.

In the building, every windowsill and every column must be shaped by an autonomous process which allows it to adapt correctly to the whole.

Each bench, each windowsill, each tile, needs to be made by a person, or a process, in tune with the subtle minute forces there, making it a little different at each point along its length and different from all the others.

And the same in the town.

In the town, each building and each garden must also by shaped by an autonomous process, which allows it to adapt to its unique particulars.

This vast variety can only be created by the people. Every house along a road must be shaped by a different person familiar with the different forces peculiar to that place. And within the house, the windows must be shaped by people who are looking out, and seeing what the boundaries of the window need to be.

This does not mean that every person has to design the place he lives in. It simply means that the love, and care, and patience needed to bring every part into adjustment with the forces acting on it, can only exist when each detailed part is cared for, and shaped, by someone who has the time and patience and knowledge to understand the forces acting on it. It is not essential that each person design or shape the place where he is going to live or work. Obviously people move, are happy in old houses, and so on.

It is essential only that the people of a society, together, all the millions of them, not just professional architects, design all the millions of places. There is no other way that human variety, and the reality of specific human lives, can find their way into the structure of the places.

But of course, autonomous creation of the parts, if taken by itself, will produce chaos.

The parts will not form any larger whole, unless the individual adaptation of the parts is under some sort of deeper regulation, which guarantees that the local process of adaptation will not only make the local part truly adapted to its own processes, but that it will also be shaped to form a larger whole.

What makes a flower whole, at the same time that all its cells are more or less autonomous, is the genetic code, which guides the process of the individual parts, and makes a whole of them.

The different cells are able to act in harmony because each one of them contains the same genetic code.

Each part (cell) is free to adapt locally to its own processes, and is helped in this process by the genetic code which guides its growth.

Yet at the same time, this same code contains features which guarantee that the slow adaptation of the individual parts is not merely anarchic, and individual, but that each part simultaneously helps to create those larger parts, systems, and patterns which are needed for the whole.

And, just as the flower needs a genetic code to keep the wholeness of its parts, so do the building and the town.

The individual building needs a code, which guarantees that all the columns and the windows, as they get in-

dividually shaped, will form a whole. It must provide the individual builder with a sequence of instructions so clear, and so fluid, that he can freely make each portion of the building perfectly, according to its place.

And the town needs a code, which makes the many actions of the great variety of people whole. It must provide the people of the town with instructions so clear that all of them can take part in the shaping of the town: just like the genetic process which creates the flower, this process must allow each person to shape his own corner of the world, so that each building, each room, each doorstep, is unique according to its place within the whole—but with the built-in guarantee that the town which emerges from these independent acts, will also be alive and whole.

So I began to wonder if there was a code, like the genetic code, for human acts of building?

Is there a fluid code, which generates the quality without a name in buildings, and makes things live? Is there some process which takes place inside a person's mind, when he allows himself to generate a building or a place which is alive? And is there indeed a process which is so simple too, that all the people of society can use it, and so generate not only individual buildings, but whole neighborhoods and towns?

It turns out that there is. It takes the form of language.

CHAPTER 10

OUR PATTERN LANGUAGES

The people can shape buildings for themselves, and have done it for centuries, by using languages which I call pattern languages. A pattern language gives each person who uses it, the power to create an infinite variety of new and unique buildings, just as his ordinary language gives him the power to create an infinite variety of sentences.

a barn? What is it that an individual farmer did, when he decided to build a barn, that made his barn a member of this family of barns, similar to hundreds of other barns, yet nevertheless unique?

At first sight, we might imagine that each farmer made his barn beautiful, simply by paying attention to its function.

Every barn must have a double door, so that the farmer can drive his hay-wagon right into the barn for unloading; every barn must provide enough hay storage to feed the cows throughout the winter; it must allow the cows to stand in a way that makes it easy to feed them, and easy to move the hay from the place where it is stored to the place where the cows eat; it must provide an easy way of washing down the cow dung and urine which accumulate; it must provide a way of supporting the roof and walls against wind loads. . . .

According to this theory, the farmer is able to make his barn beautiful, because he is so deeply in touch with it function.

But this does not explain the similarity of different barns.

If every new barn were created from scratch, purely from the functional nature of the problem, we should expect to see a much greater variety of forms than actually exists. Why are there no circular barns? Why

do some barns not have a double nave, to provide even more storage, or a double pitched roof? It may be true that these kinds of barns would not work as well as the ones which are built; but how could the builders know that, without trying it?

The fact is that they don't try it. They are simply copying the other barns which they already know.

And, indeed, everyone who has ever built anything knows that he goes about it in this way. When you put floor joists at 16″ centers, you don't work out the structural calculations every time you do it; once you are persuaded that this is a good way to build floors, you go on doing it that way, until you have some reason to rethink it.

We might imagine then, that the farmer got his power to build a barn by copying the other barns around him.

Imagine for a moment that the farmer actually had a detailed picture of another barn, or several other barns in his mind, complete down to the last details, and that when he starts to make his own barn, he simply modifies this ideal barn in his mind.

This would certainly explain why one barn looks like other barns in the valley, even where purely functional considerations don't require it.

But this does not explain the great variety of barns.

And it does not explain the enormous variations which the farmer is able to make, in his own barn, without going wrong.

For example, among the old barns in California, I know two which are radically different from the "standard" type. One of them has the same cross section as usual—but it is very very long, about 240 feet—and its main doors, instead of being at the ends, run through it, at right angles to the main axis. The other one is nestled into the slope of a hill, and it has three stories. The two lower stories are just like the normal floors of a barn, but one above the other, and approached from opposite directions.

You can say that these barns are copies too. But, obviously in these cases, the total arrangement of the "typical" barns has not been copied at all. The patterns which are typical of other barns are still present in these two barns; but the way in which the patterns are combined is utterly different.

The proper answer to the question, "How is a farmer able to make a new barn?" lies in the fact that every barn is made of patterns.

It is not the idea of copying which is at fault; only the conception of "what is copied." Obviously the farmer does have some sort of image of a barn in his mind, when he starts to make a new barn. But this image of the barn, which he has in his mind, is not an image like a drawing or a blueprint or a photograph. It is a system of patterns which functions like a language.

And the farmer is able to make a new barn, unlike the ones which he has seen before, by taking all the patterns which he knows, for barns, and combining them in a new way.

These patterns are expressed as rules of thumb, which any farmer can combine and re-combine to make an infinite variety of unique barns.

Here are some of the patterns for traditional California barns.

Make a barn in the shape of a rectangle, 30–55 feet wide, 40–250 feet long, the length at least $3x$ feet, where x is the number of cows the barn has to hold. Orient the barn so that its ends connect easily with the paths where cows come in from the fields, and with the local road.

Divide the inside of the barn into three parallel aisles: two cow milking aisles down the outer sides, and a central hay-storage aisle.

Make the central aisle 16–38 feet wide, and the outer aisles 10–16 feet wide. In certain cases, one of the side aisles can be shorter than the central aisle, thus taking a notch out of the rectangle.

Between the outer edge of the central aisle and the two outer aisles, place two rows of columns. The columns are equally spaced, and the distance between the last column and the end wall is equal to the distances between columns. Choose a column spacing between 7 and 17 feet.

If the column spacing is 7–10 feet, make the columns

Place rafters from opposite sides of the roof, meeting the main ridge beam.

Brace every corner in the framing of the side walls with a diagonal 2 x 4, about 3 feet long.

Connect the tie beams running across the central aisle to the main columns, by diagonal braces.

Connect the main purlins to the main columns, with diagonal braces 3–4 feet long. If the column spacing is more than about 21 feet also use double braces, the outer ones about 6 feet long.

To understand, in detail, how these patterns work we must extend our definition of "a pattern."

In chapters 4 and 5 we learned to see a pattern as something "in the world"—a unitary pattern of activity and space, which repeats itself over and over again, in any given place, always appearing each time in a slightly different manifestation.

When we ask, now, just where these patterns come from, and also where the variation comes from, which allows each pattern to take on a slightly different form each time that it occurs, we have been led to the idea that these patterns "in the world" are created by us, because we have other, similar patterns in our minds from which we imagine, conceive, create, build, and live these actual patterns in the world.

These patterns in our minds are, more or less, mental images of the patterns in the world: they are abstract representations of the very morphological rules which define the patterns in the world.

However, in one respect they are very different. The patterns in the world merely exist. But the same patterns in our minds are dynamic. They have force. They are generative. They tell us what to do; they tell us how we shall, or may, generate them; and they tell us too, that under certain circumstances, we *must* create them.

Each pattern is a rule which describes what you have to do to generate the entity which it defines.

Consider, for example, the pattern of hillside terracing, used in hilly countries, to make usable farmland on hilly slopes. As a "fact," this pattern merely has certain characteristics. For example: the terraces follow the contour lines; the terraces are spaced vertically at roughly equal intervals; the terrace is formed by a wall, along its outer edge, which keeps the earth from sliding; each of these outer walls rises slightly above the level of the terrace which it retains, so that it also keeps water there, evens out the rainfall, and prevents erosion. All this defines the pattern. These are the relationships which define the pattern "in the world."

Now consider the same pattern "in the farmer's mind." It contains the same information: more detailed probably, less superficial. But it contains, in addition, two other aspects. First, it includes the knowledge which is required to build a system of terraces like this. The fact that the walls are built before the terraces are filled in and leveled; the fact that there are small drain holes in the outer walls; in short, the terracing is described now as a

rule. It is a rule which tells the farmer what to do on an existing hillside to transform it into the state which has this pattern in it—in short, to generate the pattern itself, in the world.

And there is an imperative aspect to the pattern. The pattern solves a problem. It is not merely "a" pattern, which one might or might not use on a hillside. It is a *desirable* pattern; and for a person who wants to farm a hillside, and prevent it from erosion, he *must* create this pattern, in order to maintain a stable and healthy world. In this sense, the pattern not only tells him how to create the pattern of terracing, if he wants to; it also tells him that it is essential for him to do so, in certain particular contexts, and that he must create this pattern there.

It is in this sense that the system of patterns forms a language.

When the barn builder applies the patterns for a barn to one another in the proper order, he is able to create a barn. This barn will always have the particular relationships required by the patterns; however, all other sizes, angles, and relationships depend on the needs of the situation, and the whim of the builder. The family of barns produced by this system all share the morphological features specified by the rules (these are the morphological laws we have observed), but beyond that there is literally endless variety.

From a mathematical point of view, the simplest kind of language is a system which contains two sets:

1. A set of elements, or symbols.
2. A set of rules for combining these symbols.

The logical languages are an example. In a logical language, the symbols are completely abstract, the rules are the rules of logical syntax, and the sentences are called well-formed formulas. For instance, such a language might be defined by the set of symbols *,+,=,*x* and by the rule "The same symbol must never appear twice in a row." In this language, *+*+*+*+* and *x=*=+=**x* would be sentences (or well-formed formulas), but *x=x=+**+= would not be, because * appears twice in a row.

A natural language like English is a more complex system.

Again, there is a set of elements, in this case the set of words. And again there are rules which describe the possible arrangement of the words. But, there is, in addition, a structure on the words—the complex network of semantic connections, which defines each word in terms of other words, and shows how words are connected to other words.

Take for instance, a very simple sentence like "The tree is standing on the hill." The words here are elements: "The," "tree," "hill" . . . and so on. The elements are combined according to certain rules, which create a sentence. The simplest of these rules are the rules of grammar, which make it clear that the word "to be" must be transformed into "is" in this context; that the

word "the" comes before the nouns to which it refers, and so on.

Further, the meaning of the sentence comes from the network of connections among the words which tells us, for example, that a "tree" grows in the "ground" and that a "hill" is a kind of "ground," and that a tree can therefore stand on a hill.

A pattern language is a still more complex system of this kind.

The elements are patterns. There is a structure on the patterns, which describes how each pattern is itself a pattern of other smaller patterns. And there are also rules, embedded in the patterns, which describe the way that they can be created, and the way that they must be arranged with respect to other patterns.

However, in this case, the patterns are both elements and rules, so rules and elements are indistinguishable. The patterns are elements. And each pattern is also a rule, which describes the possible arrangements of the elements —themselves again other patterns.

An ordinary language like English is a system which allows us to create an infinite variety of one-dimensional combinations of words, called sentences.

First of all, it tells us which arrangements of words are legitimate sentences, in a given situation, and which are not. And, furthermore, which arrangements of words

make sense in any given situation, and which ones don't. It narrows down the total possible arrangements of words which would make sense in any given situation.

Second, it actually gives us a system which allows us to produce these sentences which make sense. So, it not only defines the sentences which make sense in a given situation; it also gives us the apparatus we need to create these sentences. It is, in other words, a generative system, which allows us to generate sentences that are appropriate to any given situation.

A pattern language is a system which allows its users to create an infinite variety of those three dimensional combinations of patterns which we call buildings, gardens, towns.

First, it defines the limited number of arrangements of spaces that make sense in any given culture. This is a far smaller collection than the total number of arrangements of jumbled nonsense, the piles of bricks and space and air and windows, kitchens on top of freeway interchanges, trees growing upside down inside a railway station—that could be put together, but would make no sense at all.

And second, a pattern language actually gives us the power to generate these coherent arrangements of space. Thus, as in the case of natural languages, the pattern language is *generative*. It not only tells us the rules of arrangement, but shows us how to construct arrangements —as many as we want—which satisfy the rules.

In summary: both ordinary languages and pattern languages are finite combinatory systems which allow us to create an infinite variety of unique combinations, appropriate to different circumstances, at will.

Natural Language	*Pattern Language*
Words	Patterns
Rules of grammar and meaning which give connections	Patterns which specify connections between patterns
Sentences	Buildings and places

Here is the outline of a pattern language for a farmhouse in the Bernese Oberland.

NORTH SOUTH AXIS
WEST FACING ENTRANCE DOWN THE SLOPE
TWO FLOORS
HAY LOFT AT THE BACK
BEDROOMS IN FRONT
GARDEN TO THE SOUTH
PITCHED ROOF
HALF-HIPPED END
BALCONY TOWARD THE GARDEN
CARVED ORNAMENTS

Each of these patterns is a field of relationships which can take an infinite variety of specific forms. And, in addition, each one is expressed in the form of a rule, which tells the farmer who is making his house just what to do.

FRONT DOOR TERRACES
CONNECTED BUILDINGS
PUBLIC WELLS AT INTERSECTIONS
STEPS IN THE STREET

These larger patterns create the structure of the town. If every person who makes an individual house, at the same time follows these larger patterns, step by step, and does whatever he can with the layout and placing of his house to help create these larger patterns too, then the town slowly gets its structure from the incremental aggregation of their individual acts.

Each person uses the language a little differently. Each person uses the language to make a building which reflects his dreams, to meet the special needs of his own family, the way they live, the animals they keep, the site, and its relation to the street . . . But overall, throughout the differences, there is a constancy, a harmony, created by the repetition of the underlying patterns.

At this stage, we have defined the concept of a pattern language clearly. We know that it is a finite system of rules which a person can use to generate an infinite variety of different buildings—all members of a family—and that the use of language will allow the people of a village or a town to generate exactly that balance of uniformity and variety which brings a place to life.

In this sense, then, we have found an example of the kind of code which does, at certain times play just the

role in buildings and in towns that the genetic code plays in a living organism.

What we do not know yet, is that these kinds of languages are ultimately responsible for every single act of building in the world.

CHAPTER 11

OUR PATTERN LANGUAGES: CONTINUED

These pattern languages are not confined to villages and farm society. All acts of building are governed by a pattern language of some sort, and the patterns in the world are there, entirely because they are created by the languages which people use.

We have seen, so far, that pattern languages were the secret of the farmer's power to build in simple villages.

But languages are more widespread, and more profound than that. The fact is that every work of building, large or small, humble or magnificent, modern or ancient, is made in this same way.

For the use of pattern languages is not merely something that happens in traditional societies. It is a fundamental fact about our human nature, as fundamental as the fact of speech.

For example, our own towns and buildings, just like any others, are all made of patterns, too.

Look around our world. Our world is made of freeways, gas stations, houses, sidewalks, kitchens, buildings, bare concrete walls, flat roofs, front doors, television, parking garages, skyscrapers, elevators, high schools, hospitals, parks, parking places, gutters, trees in concrete boxes, tubs of artificial flowers, neon signs, telephone wires, picture windows, front gardens, back gardens, gilt plastic-framed pictures, motels, supermarkets, hamburger joints, sandwich machines.

The patterns of our time, like all other patterns in the built environment, come from the pattern languages which people use.

For instance, the freeways are built from handbooks, which contain, more or less exactly in the form of patterns, rules which prescribe the optimum spacing of exits,

at different densities, the best configurations for the exits under different conditions, the proper curvature and inclination of the petals of a cloverleaf . . . .

And the gas stations built by any one company are often built from a little book, which describes the essential features of, for instance, a "Shell" gas station—and describes how these essential features may be combined differently, in different situations, to provide a gas station which is still one of the family of Shell gas stations, but adapted to a local site.

Indeed, as we shall see now, these patterns always come from languages. They come into the man-made world, because we always put them there—and we put them there by using languages.

Each window, room, house, street and neighborhood, gets those patterns which identify it, which give it its structure, from a language: and each entity within the world is governed, and guided in its development, by an internal pattern language which functions for it, just as the genetic code works for an organism.

Of course, these patterns do not come only from the work of architects or planners.

Architects are responsible for no more than perhaps 5 percent of all the buildings in the world.

Most buildings, streets, shops, offices, rooms, kitchens, cafes, factories, gas stations, freeways, bridges . . .

of an office building on Park Avenue. He is confined by law, to make the building envelope conform to the daylight requirements of the building code, and knows before he starts that he will have to create a more or less pyramidal envelope.

Example: A housewife asks her husband to build shelves across the kitchen windows, the way she saw in last month's *House and Garden*. Again, the pattern, which says that shelves across a kitchen window are a good idea in general, is in her mind before her decision to try it in her own kitchen.

Everybody follows rules of thumb.

Example: A man who is fixing the bathroom goes to the local hardware store, and buys an expanding shower curtain rail, which can be force-fitted between the bathroom walls above the bathtub. The fact that this fixture is available on the market, and is the easiest to fix, is the controlling force behind the pattern in his mind which tells him how to place the shower curtain rod.

Example: A small town decides to close off the central street in town, to form a pedestrian precinct. It is probably acting under guidance from architects: and the architects base their advice on a pattern that has been emerging in architectural thought for more than twenty years.

Example: The landscape architect who is called in to do the detailing of the pedestrian precinct, uses brick walks, planters, and benches—all part of the current vernacular

for pedestrian precincts, and all in his mind long before he started this particular job.

Example: A bank decides to lend money to one developer, and not to another. The bank bases its decisions on rules of thumb about the density of land coverage which will bring a reasonable financial return. Their patterns tell them not to lend money to people who want to put small buildings on large pieces of land, in central cities.

Example: The Parks Department is thinning the trees in the park. If they are pine trees, they are left spaced at about 15 foot centers; any extra trees are taken out, so that the trees won't stop each other from growing. This spacing for pine trees is a widely known pattern taught in forestry school and used all over the world.

And all these rules of thumb—or patterns—are part of larger systems which are languages.

For, of course, these rules of thumb, which I have given as examples, do not exist, independently, isolated, free-floating.

Each one is part of a system of other rules of thumb, organized, so that the rules of thumb, or patterns, can be used, not only to make isolated decisions, but to create complete things—complete parks, buildings, park benches, freeway interchanges . . . and so on.

Every person has a pattern language in his mind.

Your pattern language is the sum total of *your* knowl-

And you yourself make your designs by using a pattern language.

Imagine for a moment that I ask you to lay out a simple cottage for yourself.

Now, let me ask you this: Are the rooms in your cottage circular? Almost certainly not. Most likely you have a rule in your mind which tells you that the rooms in your building should be more or less rough rectangles.

I do not say, for the moment, that this rule is good or bad. I only ask you to recognize that you do have a rule of some kind, which tells you roughly what kind of shape to make the rooms. . . .

And you have many, many rules like this.

Indeed it is the system of these rules that is your present language.

And your creative power is entirely given by the power of these patterns. Your power to create a building is limited entirely by the rules you happen to have in your language now.

At the moment when a person is faced with an act of design, he does not have time to think about it from scratch.

He is faced with the need to act, he has to act fast; and the only way of acting fast is to rely on the various rules

of thumb which he has accumulated in his mind. In short, each one of us, no matter how humble, or how elevated, has a vast fabric of rules of thumb, in our minds, which tell us what to do when it comes time to act. At the time of any act of design, all we can hope to do is to use the rules of thumb we have collected, in the best way we know how.

Even when a person seems to "go back to the basic problem," he is still always combining patterns that are already in his mind.

Although he may manage to transform these patterns, slightly, according to a new analysis of the problem, it is still the pattern language in his mind which forms the groundwork of what he does.

You may think: Well, I do not have any kind of pattern language in my mind at present.

There are people who may deny the existence of patterns in their own minds. To such a person I ask a simple question: If you know anything about how to make buildings, what is it that you know?

Your answer may be that you rely on the depths of your emotion and intuition to respond, in a unique fashion, to each new problem that presents itself to you. But even this emotion and intuition is guided by some principles—however deep. Even if you have never tried to make these principles explicit for yourself, and even if you cannot do so, still, somewhere in your mind there are these principles, couched in who knows what form—and it is these

principles which come into action, through intuition and emotion, when you make a design.

It is only because a person has a pattern language in his mind, that he can be creative when he builds.

You may be unwilling to admit that your creative power comes from a language in your mind, because you are afraid that the rules of a language in your mind may prevent you from being free and creative. The very opposite is true. A pattern language is the very source of creative power in the individuals who use it, and without a language they could create nothing. It is the language they could create nothing. It is the language which *makes* them creative.

Remember English. It would be ridiculous to say that the rules of English in your head restrict your freedom. When you say something, you say it *in* English; and even though you may sometimes be frustrated by what cannot be said, still, when you speak you have no wish to be free of the rules. In fact, a vast part of what you know is captured in the fabric of these rules—every concept which you understood because you can express it in terms of other concepts is part of the English in your mind.

The rules of English make you creative because they save you from having to bother with meaningless combinations of words.

Most possible combinations of words are mere jumbles

("cat work house tea is," and so on). There are far more of these nonsensical combinations than of the combinations which make sense.

Suppose you had to search in your mind, among all the possible combinations of words every time you wanted to say something—you would never even get to the things you want to say: and you certainly would be unable to say anything that expressed deep feeling or meaning.

The rules of English steer you away from the vast number of nonsensical sentences, and towards the smaller —though still vast—number of sentences which make sense; so that you can pour all your effort into the finer shades of meaning. If it were not for the rules of English, you would spend all your time struggling to say anything at all.

A pattern language does the same.

A pattern language is really nothing more than a precise way of describing someone's experience of building. If a man has a great deal of experience of building houses, his language for houses is rich and complex; if he is a greenhorn, his language is naïve and simple. A poet of houses, a master builder, couldn't possibly work without his language—it would be as if he were a greenhorn.

Again, if you think of all the possible combinations of columns, and studs, and walls, and windows, most of them are meaningless jumbles. The number of meaningless combinations is vastly larger than the number of combinations which make sense as buildings. A man with-

out a language would have to comb his mind to find even one meaningful design among all these meaningless combinations, and he would never even get to the subtleties which make a building work.

So the use of language is not merely something that happens in traditional societies. It is a fundamental fact about our human nature, as fundamental as the fact of speech.

Every creative act relies on language. It is not only those creative acts which are part of a traditional society which rely on language: all creative acts rely on pattern languages: the fumbling inexperienced constructions of a novice are made within the language which he has. The works of idiosyncratic genius are also created within some part of language too. And the most ordinary roads and bridges are all built within a language too.

And now at last it becomes clear just where the patterns in the world come from.

In chapter 5, we saw that every part of the world is given its character, essentially, by a small number of patterns which repeat themselves over and over again. Patterns which repeat to create the floorboards in the floor; patterns which repeat to create the rooftops of a town; patterns which create the overall arrangement of the town which gives one place the character of Paris, and another place the character of London . . .

Where does all this repetition come from? Where does

the order come from? Where does the coherence come from? Where, above all, do the patterns come from, and why are just a few of them repeated over and over again?

We now know the answer to this question.

The patterns, which repeat themselves, come simply from the fact that all the people have a common language, and that each one of them uses this common language when he makes a thing.

Each person has his own version of this common language, no doubt; but, broadly speaking, each person knows the same patterns, and the same patterns therefore keep repeating and repeating and repeating, always with infinite variety, simply because these are the patterns in the language which people use.

Every single part of the environment is governed by some portion of a pattern language.

There are languages for the layout of fields, for the arrangement of the streets, for public squares, for building public buildings, churches, temples, languages for laying out the way that buildings group, for mending walls, for making stairs, for the arrangement of the shops and cafés along the street, and for the way the inside of the shops are going to be made and used. . . .

And the enormous repetition of patterns, which makes up the world, comes about because the languages

We have a habit of thinking that the deepest insights, the most mystical, and spiritual insights, are somehow less ordinary than most things—that they are extraordinary.

This is only the shallow refuge of the person who does not yet know what he is doing.

In fact, the opposite is true: the most mystical, most religious, most wonderful—these are not less ordinary than most things—they are more ordinary than most things.

It is because they are so ordinary, indeed, that they strike to the core.

And this is connected to the fact that these things can, indeed, be expressed clearly, discovered, talked about. These deep things which really matter, they are not fragile—they are so solid that they can be talked about, expressed quite clearly. What makes them hard to find is not that they are unusual, strange, hard to express—but on the contrary that they are so ordinary, so utterly basic in the ordinary bread and butter sense—that we never think of looking for them. Let me give two examples: one from the beauty of old prayer rugs, the other from the art of building.

The old Turkish prayer rugs, made two hundred years ago, have the most wonderful colors.

And indeed, there is an answer. Even though the rules are simple, by the time you have twenty, perhaps fifty rules like this in your mind, it takes almost inhuman singleness of purpose to insist on them—not to let go of them.

It is so easy to say—oh well, it is too hard to have light on two sides of this room, and that room—at the same time as all other things we are trying to do. It will be alright if we allow this room to have light on just one side. The fact is that it will not be alright. But to insist, to keep all the rules which matter, freely in your mind, and not to let go of them—that does perhaps require unusual character of purpose.

But of course, the fact that these rules are simple does not mean that they are easy to observe, or easy to invent.

Just as a great artist is one who observes very carefully the things which make the difference—so it does, indeed, take great powers of observation—great depth, great concentration, to formulate these simple rules.

A man who knows how to build has observed hundreds of rooms, and has finally understood the "secret" of making a room with beautiful proportions say. . . . This knowledge exists, in his mind, in the form of a rudimentary pattern, which tells him, under such and such circumstances, create the following field of relationships . . . for such and such reasons. It may have taken years of observation for him finally to understand this rule.

It may be hard to believe that one might make a work of art by simply combining patterns.

It sounds almost as though there was a box of "magic" parts, so powerful, that anyone can make a beautiful thing, simply by combining them.

This is absurd, because, of course, it is not possible to make something beautiful, merely by combining fixed components.

But once again, the difficulty of believing it may have to do with the fact that we tend to think of patterns as "things," and keep forgetting that they are complex, and potent fields.

Each pattern is a field—not fixed, but a bundle of relationships, capable of being different each time that it occurs, yet deep enough to bestow life wherever it occurs.

A collection of these deep patterns, each one a fluid field, capable of being combined, and overlapping in entirely unpredictable ways, and capable of generating an entirely unpredictable system of new and unforeseen relationships.

When we remember this, it may be easier to recognize how powerful they are—and that we do indeed, have our creative power as a result of the system of patterns which we have.

The source of life which you create lies in the power of the language which you have.

If your language is empty, your buildings cannot be full. If your language is poor, you cannot make good buildings until you enrich your language. If your language is rigid, your buildings must be rigid. If your language is florid, your buildings will be florid. Your language generates the buildings which you make, and the buildings live or not, according to the life your language has.

Pattern languages are the source of beauty and of ugliness. They are the source of all creative power: nothing is made without a pattern language in the maker's mind; and what that thing becomes, its depth, or its banality, comes also from the pattern language in the builder's mind.

And now we realize the truly immense power which pattern languages have.

For it is not only true that every building gets its structure from the languages which people use.

It is also true that the spirit which the buildings have, their power, their life, comes from the pattern languages their builders use as well. The beauty of the great cathedrals, the fire in the windows, the touching grace of ornaments, the carving of the columns and the column capitals, the great silence of the empty space which forms the heart of the cathedral . . . all these come from the pattern languages their builders use as well.

If we hope to bring our towns and buildings back to life, we must begin to re-create our languages, in such a way that all of us can use them: with the patterns in them so intense, so full of life again, that what we make within these languages will, almost of its own accord, begin to sing.

To start with this requires simply that we find a way of talking about patterns, in a way that can be shared.

How can this be done? In a traditional culture, these patterns exist as independent entities within your mind, but it is not necessary for you to recognize them as separate atomic units, nor to know them by name, nor to be able to speak about them. It is no more necessary than it is for you to be able to describe the rules of grammar in the language which you speak.

However, in a period when languages are no longer widely shared, when people have been robbed of their intuitions by specialists, when they no longer even know the simplest patterns that were once implicit in their habits, it becomes necessary to make patterns explicit, precisely and scientifically, so that they can be shared in a new way—explicitly, instead of implicitly—and discussed in public.

In order to make patterns explicit, so that they can be shared in this new way, we must first of all review the very complex structure of a pattern.

Throughout this book we have had a gradual awakening,

a growing understanding of what a pattern is. This awakening began, in chapters 4 and 5, where the concept was first defined; the concept was then extended and refined, in chapter 6 and then again in chapters 10, 11 and 12.

I shall now describe the structure of a single pattern precisely, in a way that includes all the properties which living patterns have to have, as they have been discussed in all these chapters.

Each pattern is a three-part rule, which expresses a relation between a certain context, a problem, and a solution.

As an element in the world, each pattern is a relationship between a certain context, a certain system of forces which occurs repeatedly in that context, and a certain spatial configuration which allows these forces to resolve themselves.

As an element of language, a pattern is an instruction, which shows how this spatial configuration can be used, over and over again, to resolve the given system of forces, wherever the context makes it relevant.

The pattern is, in short, at the same time a thing, which happens in the world, and the rule which tells us how to create that thing, and when we must create it. It is both a process and a thing; both a description of a thing which is alive, and a description of the process which will generate that thing.

Patterns can exist at all scales.

partly ecological, and partly in the realm of human fear and danger.

COLUMNS AT THE CORNERS resolves conflicts among forces which arise within the process of construction.

WINDOW PLACE resolves forces which are purely psychological.

To make a pattern explicit, we merely have to make the inner structure of the pattern clear.

Let us start with a very simple commonsense example. Suppose that we are in a place. We have a general sense that something is "right" there; something is working; something feels good; and we want to identify this "something" concretely so that we can share it with someone else, and use it over and over again.

What do we have to do? As we shall now see, there are always three essential things we must identify.

What, exactly, is this something?

Why, exactly, is this something helping to make the place alive?

And *when*, or *where*, exactly, will this pattern work?

We must first define some physical feature of the place, which seems worth abstracting.

Take, for the sake of an example, Ostenfeldgaarden—a beautiful old Danish house built in 1685, now in the Copenhagen Open Air Museum. As soon as I went there, I knew that it had special qualities which would be useful even today, if I could only pin them down. How