

THE FIFTEEN PROPERTIES OF



BY CHRISTOPHER ALEXANDER

About twenty years ago, I began to notice that objects and buildings which have life all have certain identifiable structural characteristics. The same geometric features keep showing up in them, again and again. Initially I began writing these characteristics down informally, and I began to "keep watch" on them.

What I did was straightforward and empirical. I simply looked at thousands and thousands of examples, comparing those which had more life with those that had less life. Whenever I looked at two examples, I could determine which one had greater "life" or greater wholeness, by asking which of them generated a greater wholeness in me. Thus, I did not impose on myself the modesty of judgment typical in a pluralistic society. I did not worry about "my" values compared with someone else's values. I simply identified those examples which had the greater wholeness, judging this by the degree of wholeness they induced in me, and assuming, with as much confidence as I felt to be real and reliable, that what I measured here would also be shared with others.

I asked myself this question: Can we find any structural features which tend to be present in the examples which have more life, and tend to be missing in the ones which have less life? In other words, can we find any recurrent geometrical structural features whose presence in things correlates with their degree of life? To find this out, it is necessary to make thousands and thousands of

comparisons, to ask oneself constantly whether any features can be identified which correlate with the degree of wholeness which things have. This is what I did. For twenty years, I spent two or three hours a day looking at pairs of things—buildings, tiles, stones, windows, carpets, figures, carvings of flowers, paths. Seats, furniture, streets, paintings, fountains, doorways, arches, friezes—comparing them, and asking myself: Which one has more life? And then asking: What are the common features of the examples that have most life?

I managed to identify fifteen structural features which appear again and again in things which do have life. These are: 1. LEVELS OF SCALE, 2. STRONG CENTERS, 3. BOUNDARIES, 4. ALTERNATING REPETITION, 5. POSITIVE SPACE, 6. GOOD SHAPE, 7. LOCAL SYMMETRIES, 8. DEEP INTERLOCK AND AMBIGUITY, 9. CONTRAST, 10. GRADIENTS, 11. ROUGHNESS, 12. ECHOES, 13. THE VOID, 14. SIMPLICITY AND INNER CALM, 15. NON-SEPARATENESS.

...The fifteen properties identify the character of living systems. The regions of space which can have this living character vary enormously. If we have a bowl, a picture, a building, a forest, a pathway in a temple, a bay window in a London house—and we see all fifteen properties repeating throughout again and again and again, there is a good chance we have a thing or place whose life is profound. Systems in space which have these fifteen properties to a strong degree will be alive, and the more these properties are present, the more the systems which contain them will tend to be alive.

These include most examples of natural living systems: a clump of grass in a swamp. They may include a medieval illuminated miniature; the window in the wonderful room at the Topkapi palace in Istanbul. They will also include, at a lower level, places or things which have more ordinary life. This may include the terrace outside your favorite gas station, a beer garden outside the Oetzthal station in Austria. It may include the seaweed in a tidal flat, even with a few cans and bottles lying there.

If we look at things which have a few of the fifteen properties, less densely packed, and not all of them, we often get some sort of living character, for instance, the stadium at Wrigley Field, a pair of roller skates, a toothbrush.

The things and systems in the world which are most dead—the most image-laden buildings and artifacts, the most sterile housing projects, the most damaged ecological systems, the most poisoned streams—will have these properties to the least degree.

Thus, although these properties define a vast family of possible places and objects and systems, all the members of this family have life in some degree. The properties, taken together, define a rough but graspable family of all those systems and things which have a great deal of life. Thus roughly (and I must emphasize that this is only true to a first approximation), the fifteen properties define the enormous family of systems, among all possible systems, which have life in them.

Excerpted with permission from *The Nature of Order* (see review and access, page 73).

The fact that it is possible to characterize this family at all is surprising. The family which is so defined is very complex morphologically. Superficially, the many examples in this chapter look dissimilar. Each belongs to its own time and place. They vary in culture, climate, and technology. But more deeply, there is a sense in which these different cases all look the same. They all have the same deep quality; one sees the same structure, again and again, throughout the examples.

Thus we have a grip, perhaps for the first time, on the actual physical and geometrical character which living systems have. It is not too much to say that any building which has life in it, must be a recognizable member of this family. Any doorknob which has life, any garden, any garden path, which has life in it, must be a recognizable member of this family.

It should be observed that this fact is not neutral with regard to theories of architecture. One cannot help noticing that the buildings of recent decades (1940–90) are noticeably missing in these properties. I believe that this is intentional, and that various unusual twentieth-century theories of architecture have led architects and designers consciously to move away from these properties in the effort to promulgate some particular

style or intention. For people who have been brainwashed by these recent theories of design, it may be uncomfortable to confront the factual nature of the fifteen properties. I believe this cannot be helped.

It is useful, I think, to make some mention of the dates of manufacture of the artifacts shown as examples. Readers and students have observed that many of these properties belong to ancient artifacts. They ask me, Why don't you give more examples of recently built buildings to illustrate these properties? The sad truth is that the works of the last fifty years have consciously abandoned understanding, or use, of these properties. Such works obviously do not serve well as illustrations except in a bad sense. This does not mean that the fifteen properties have anything to do with ancient things as opposed to modern ones. Many of the examples (positive and negative) are made in the twentieth century. Overall, the dates of the objects range from about 1500 BCE to 1997 CE—a span of some 3,500 years. There is a more or less homogeneous distribution of examples over that very long period. The fact that there are relatively fewer examples to be shown from the last seventy years is not polemical, but merely factual and proportioned.

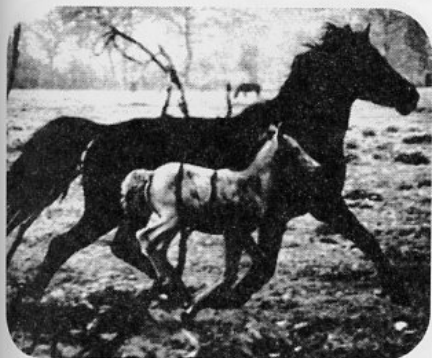
I first identified these fifteen properties during the years 1966–73. By 1976 these were well defined, and it was clear to me that they occurred repeatedly in those artifacts which have life....

However, in 1976, it was not yet clear to me how to interpret these properties. They were, at that time, only raw products of observation. I knew that these features appeared repeatedly both in great buildings and works of art, and in nature, but I had no clear idea what they meant, or where they came from.

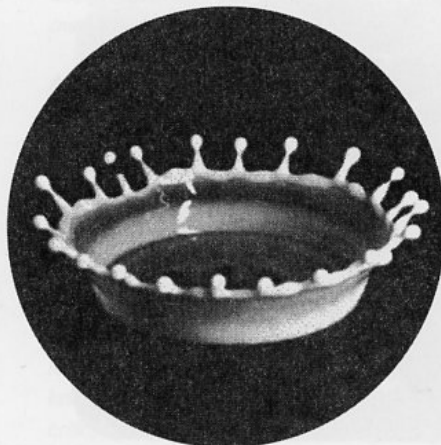
...I began to realize that these fifteen properties were indicators, rough approximations of some deeper structure which looked and felt like “all of them together.”

...I finally recognized that it is the field of centers which is primary, not these fifteen properties, and that the properties are simply aspects of the field which help us to understand concretely how the field works.

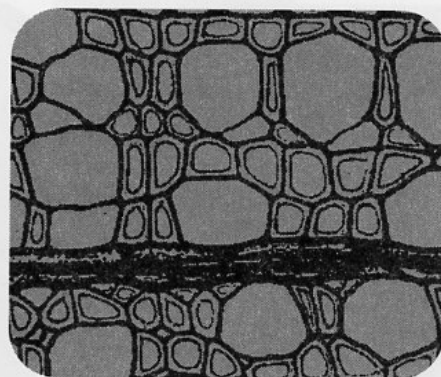
...Simply put, I believe that these properties arise because they are the principal ways in which centers can be strengthened by other centers. They are, if you like, fifteen ways of talking about centers, and the way that the existence and life of centers dominates the existence of life in the world.



1. LEVELS OF SCALE is the way that a strong center is made stronger partly by smaller strong centers contained in it, and partly by its larger strong centers which contain it.

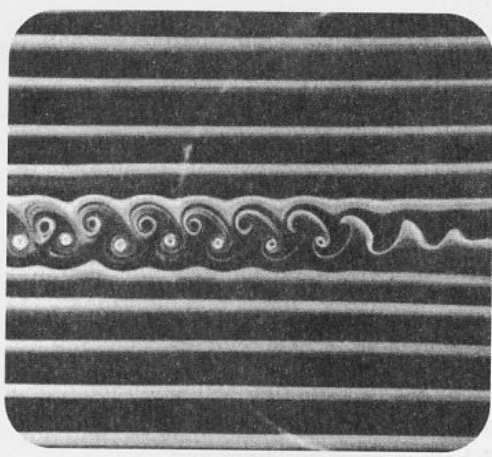


2. STRONG CENTERS defines the way that a strong center requires a spatial field-like effect, created by other centers, as the primary source of its strength.

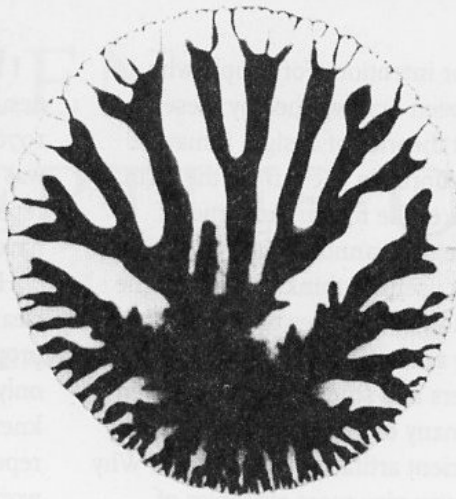


3. BOUNDARIES is the way in which the field-like effect of a center is strengthened by the creation of a ring-like center, made of smaller centers which surround and intensify the first. The boundary also unites the center with the centers beyond it, thus strengthening it further.

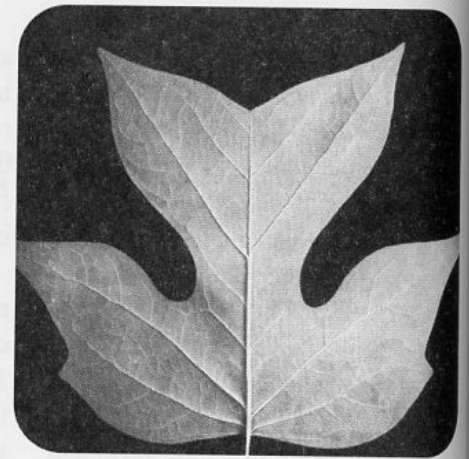
For key to illustrations, see page 73.



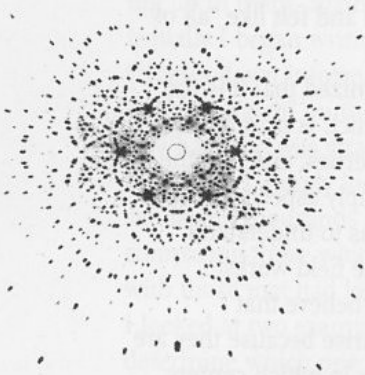
4. ALTERNATING REPETITION is the way in which centers are strengthened when they repeat, by the insertion of other centers between the repeating ones.



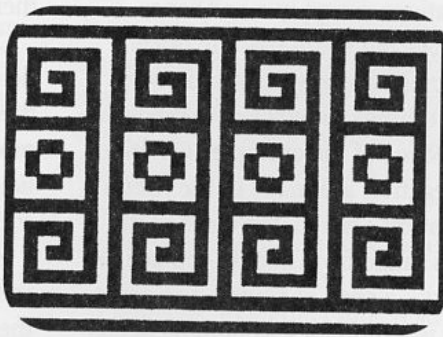
5. POSITIVE SPACE is the way that a given center must draw its strength, in part, from the strength of other centers immediately adjacent to it in space.



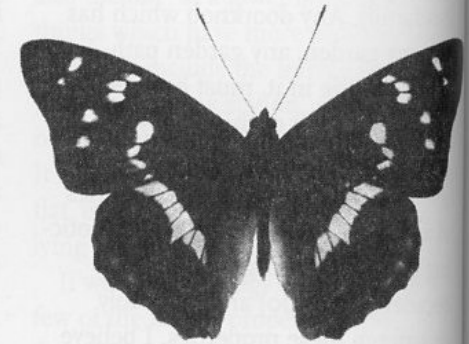
6. GOOD SHAPE is the way that the strength of a given center depends on its actual shape, and the way this effect requires that even the shape, its boundary, and the space around it are made up of strong centers.



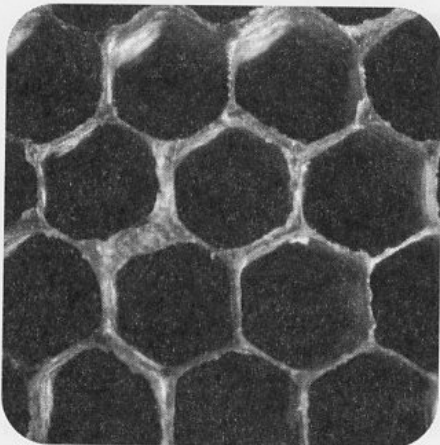
7. LOCAL SYMMETRIES is the way that the intensity of a given center is increased by the extent to which other smaller centers which it contains are themselves arranged in locally symmetrical groups.



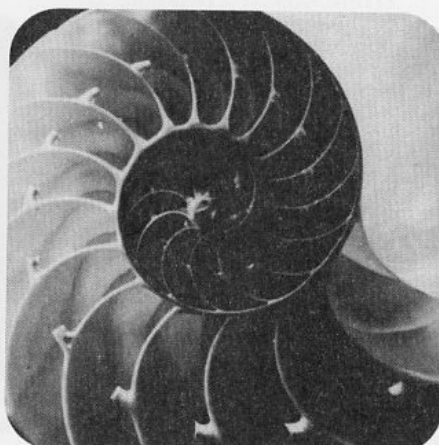
8. DEEP INTERLOCK AND AMBIGUITY is the way in which the intensity of a given center can be increased when it is attached to nearby strong centers, through a third set of strong centers that ambiguously belong to both.



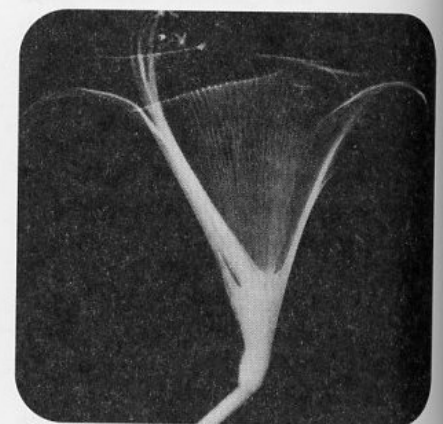
9. CONTRAST is the way that a center is strengthened by the sharpness of the distinction between its character and the character of surrounding centers.



10. ROUGHNESS is the way that the field effect of a given center draws its strength, necessarily, from irregularities in the sizes, shapes, and arrangements of other nearby centers.



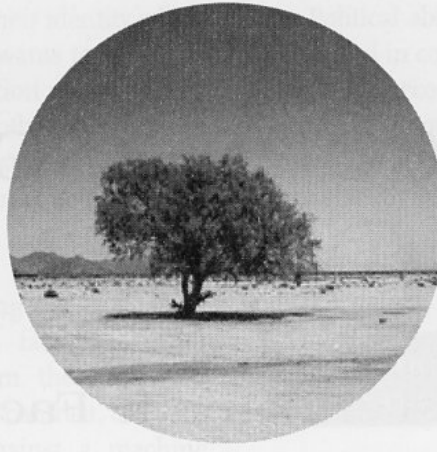
11. GRADIENTS is the way a center is strengthened by a graded series of different-sized centers which then "point" to the new center and intensify its field effect.



12. ECHOES is the way that the strength of a given center depends on similarities of angle and orientation and systems of centers forming characteristic angles thus forming larger centers, among the centers it contains.



13. THE VOID is the way that the intensity of every center depends on the existence of a still place—an empty center—somewhere in its field.



14. SIMPLICITY AND INNER CALM is the way the strength of a center depends on its simplicity—on the process of reducing the number of different centers which exist in it, while increasing the strength of these centers to make them weigh more.



15. NON-SEPARATENESS is the way the life and strength of a center is merged smoothly—sometimes even indistinguishably—with the centers that form its surroundings.

Illustration Key

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| 1. Colt and mare. | 6. Tulip tree leaf. | 12. X-ray of a lily. |
| 2. A milk drop splash. | 7. Scattering from a beryllium atom. | 13. The eye of a storm. |
| 3. Layers of boundaries in wood tissue. | 8. Greek fret ornament. | 14. A desert landscape. |
| 4. Mid-span wake of an airfoil. | 9. Purple emperor butterfly. | 15. Edge of a lake. |
| 5. Ink and gelatin. | 10. Cells of a honeycomb. | |
| | 11. Chambered nautilus. | |

Nos. 3, 4, 5, 6, 7, 9, 12, 13, 15 from *The Nature of Order*. Nos. 2, 11 from Peter S. Stevens, *Patterns in Nature* (out of print). No. 8 from István Hargittai and Magdolna Hargittai, *Symmetry: A Unifying Concept*.

Christopher Alexander was born in Vienna and educated at Cambridge University and Harvard. He is professor of architecture at the University of California, Berkeley. Since *Whole Earth* reviewed his *Pattern Language* twenty-five years ago, it has remained one of the books readers have repeatedly cited as most influential in their lives. *The Phenomenon of Life* is the first volume of a four-volume, 2,000-page magnum opus to be published over the next several months. See also www.patternlanguage.com for a fuller understanding of the pattern language, examples of its use, and links to Alexander's network. —MKS

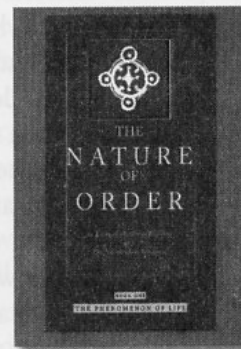
The Nature of Order

In *A Pattern Language* Chris Alexander and colleagues answered many problems of the built environment by proposing a large set of connected directives for everyday choices in planning, design, and construction, such as "Vary ceiling heights continuously throughout the building." Although there was some chaff with the wheat, the book attracted thousands of fans and users because it was people-centered, good-hearted, persuasive, and directly usable.

Now *The Nature of Order* meticulously and seductively unfolds a thought tapestry mapping out the unity and life underlying all levels of physical form. To enter this rich fabric is to dive headlong into a vast, hypnotic network of richly ordered centers. The intricate geometry of the oriental carpets he has so intensively studied has given Alexander a lens for studying everything in nature and everything humans build. The result is the direct opposite of a quick series of sound bites!

The idea of wholeness is not new. What is new is for a mathematically trained and humanistic architect to devote decades to rigorously articulating a new vision for seeing and form-making in the physical world. As an architect (and former student of Alexander's), I find it incredibly refreshing to try to weave these ideas into my daily design work and into the evolution of my own little homestead.

Alexander gently educates the eye to see how modern architecture often bulges with ego, technological prowess, and form-making cleverness, but is short on soul, heart, and understanding exactly what makes some buildings and places live more than others. Seeking deep wholeness and life requires transcending the modernist/traditionalist dichotomy to enter into a timeless realm where geometry merges with spirit. I know of no other architectural theoretician, critic, editor, or philosopher offering thought remotely as inspiring, challenging, or comprehensive. —Robert Gay



The Nature of Order An Essay on the Art of Building and the Nature of the Universe Book One: The Phenomenon of Life

Christopher Alexander
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\$75
Oxford University Press