

THE NATURE OF ORDER: AN ESSAY ON THE ART OF BUILDING AND THE NATURE OF THE UNIVERSE
BOOK FOUR: THE LUMINOUS GROUND

Christopher Alexander

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**Review by NIKOS A. SALINGAROS
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Christopher Alexander was trained in mathematics and physics before becoming an architect. True to his scientific roots, Alexander has been relentless in his quest toward understanding the nature of things and how they reveal themselves to us through what he defines as *living structure*. Alexander's living structure can be described as a state of matter with special properties, in which the underlying forces and material characteristics pull matter together into forms and expressions that extend human existence. It is thus a physical state albeit one detectable by interaction with a human being.

At the core of this living matter is what Alexander terms the "I," the transcendental ground of all existence that resides in each of us. Alexander says that this "I" lies behind and inside matter and space, and constitutes our ability to connect with living structure by way of geometrical entities that he refers to as *centers*. As a first approximation, Alexander defines a center as a psychological entity that is perceived as a whole, creating the sensation/perception/feeling of a center in a visual field that is itself coherent. A real living center is something almost being-like, he says.

Recognizing in his research an inexplicable phenomenon that occurs when matter transcends its materiality, Alexander constructs an argument for the existence of something else, an almost spiritual immateriality. He believes it is the combination of these two states of existence that imbues physical form with the characteristics of life. To further define

and express the idea of living structure, Alexander frames this experience (the topic of Book Four of *The Nature of Order*) through an animating force of *unity*. Alexander tells us that this unity exists in the universe as a real thing that is observable and exists in parallel to the material world. Looking to the seventeenth-century Japanese poet Basho, Alexander says: "The unity is not merely a unity in the surface, in the appearance of things—it is a unity of the most fundamental kind, which goes to the raw reality and which has, when it occurs, a highly unexpected, sometimes rambling, sometimes ferocious, sometimes friendly, even sometimes absurdly crude or comfortable character" (p. 258).

In the struggle between an almost baffling incomprehensibility and a fierce actuality, unity is proffered to be a transcendent property, situating itself beyond the limits of the physical world. While admitting the romantic implications that Cartesian logic would ascribe to this explanation, Alexander doesn't retreat; instead he extends his case toward the immediate and inexplicable reaction of vital impulse. The rational part of any investigation is by its essence relative, leading us from isolated data to conclusions or from parts to wholes. Any preference or precept declared to be ultimate is almost always seen as irrational. For Alexander, the question of ultimate unity transcends the trappings of both rational and irrational thought, both science and philosophy, both the objective and the subjective, both material and spiritual, suggesting instead that these categories are all but indistinguishable in living structure.

In his effort to describe the moment when these two entities exist as one, Alexander speaks of a *luminous ground* as the spirit that animates each living center; a condition or state revealed through existence: "It is that shining something which draws me on, which I feel in the bones of the world, which comes out of the earth and makes our existence luminous" (p. 2). At once, it is as if we have been brought full circle, as if we have come across Lucretius himself atop Rome's Palatine Hill in the first century BC writing his

poem about the physical universe, *De Rerum Natura*. Or perhaps we have just stumbled across Plotinus in the Temple of Isis in the third century AD calling upon the Mystics to elucidate his vision of the universe, one in which he proffers that through the embodiment of spiritual forms, light infuses the world with matter.

Here, however, we must recognize that Alexander, in his pursuit to reconcile these two realms within the pure “unity of one,” has made his assertions on the back of over three hundred years of empirical natural scientific thought. For us to conjure up such historic characters and their philosophical ponderings might appear to some readers to misdirect the critique we have undertaken of his book, but this association clearly sheds light on the magnitude and nature of the problem that Alexander has faced. This schism with which he wrestles—i.e., the dualistic nature of human consciousness—dates back over two thousand years to when humankind first began to grasp its own existence within a physical world.

The term *physics*, derived from the Greek word *physis*, simply means the endeavor of seeing the essential nature of things. Originally defined and set forth within a culture where science, philosophy, and religion were not considered separate, these concepts at one time represented collectively the full embodiment of intellectual thought. Called *hylozoists* (“those who think matter is alive”), the sixth-century BC Milesian philosophers had no word for matter, making no distinction between animate and inanimate entities. They believed that all forms of existence were manifestations of the *physis* and thus were endowed with both life and spirituality. Thales claimed all things to be full of gods, whereas Anaximander perceived the universe as a life form supported by *pneuma* (the cosmic breath). The taking apart of our existential universe actually began one century later with the Eleatic School and its belief of a Divine Principle above all gods and men. This idea was first identified with the unity of the universe, but was later re-constructed as an intelligent or personal God who was separate from the world. This separation of spirit and matter ultimately led to the dualistic foundations of Western philosophy and science.

The separation of mind from matter, of body from soul, has defied unqualified resolution, with the debate taking on myriad forms. How we anchor

ourselves in our world today is categorized almost exclusively by one particular strain of philosophical enquiry, namely seventeenth-century Cartesian thought, which separates mind and matter through a mechanistic objectivity. It wasn't until Husserl tried to restore the sense of the object through phenomenological analysis, by including within perception itself both what is manifest and what is latent, that the view of the world began to change. Under Husserl's watch, the object emerged from its earlier reductive form and was extended to the transcendent unity of both presence and absence.

Able to see beyond what came before him, Alexander has placed his pursuit of transcendental unity firmly on the shoulders of a lifetime of analytic research toward the nature of things. Drawn to explore the other side of this coin, Alexander reveals a greater expression of how living structure presents itself within the constructs of spirituality and religion.

Spirit had been banished from science over three hundred years ago through the fundamental assertion that there is only one kind of matter, and that an understanding of matter as inert and machine-like is sufficient to allow us to construct a complete and comprehensive view of the universe. But it is in our spiritual moments that we feel most alive. And no sentient human being can deny experiencing such spiritual moments. For it is in those instances that we are totally aware of our environment, fostering a profound sense of belonging to the whole. For most of us lasting only a brief moment, we experience a view of the cosmos as one inseparable reality—both spiritual and material at once—a concept that stirs in Alexander's world. From physical science to a metaphysical dimension, from material existentialism to ontological form and to the psychological role that self plays in the comprehension of living structure, Alexander pursues the nature of the world through a continuum of thought. In this search, the world is demystified only to reveal the presence of indescribable substances that animate all of living structure in a mysterious manner. The series of four books comprising *The Nature of Order* examines how human beings connect to the universe through structure, questioning how we as human beings construct buildings and cities; how we create structure in artifacts and art; how we generate complex structures outside art and

architecture, such as computer hardware and software; how Nature creates structure; and what the relationships among all of these are.

The first three volumes treat art, architecture, and urbanism in great detail, introducing empirical tests in order to tell a good structure from a bad structure. To most readers, the preceding sentence is an unbelievable, if not revolutionary, statement: How can one structure be better than another? And yet, there exist stringent criteria. In *Nature*, “good” structures keep appearing over and over again in different contexts. It is not just forms that recur, but certain organizations of complexity are found to recur throughout Nature, on different scales. These are “good” structures. On the other hand, “bad” structures are those that are ruthlessly eliminated by natural selection, so that we don’t see them or we encounter them only briefly before they disappear. Alexander provides a scientific explanation of how “good” structures arise as the result of a generative process, and how we human beings can better understand this process.

After reading the first three volumes of *The Nature of Order*, a new appreciation of form and structure emerges: a profound new realization that we, as human beings, are capable of reaching outside ourselves to connect to our surroundings. An almost spiritual unity is achievable between our inner and outer worlds. After finishing Book Three we begin to realize that more questions have been raised than have been answered. Alexander has indeed opened a Pandora’s box of philosophical and even religious questions on the nature of the universe, and it is his intellectual curiosity and a scholar’s need for completion that make Book Four an inevitability.

Alexander’s results reveal that a unity can emerge from combining individual components of a building. Each component can be made to cooperate with every other component as well as with the whole, so as to unify the structure. This process where the whole is greater than the simple sum of its parts is known as *emergence* in the scientist’s sense. It is also sudden when it is achieved. The process has at the same time a philosophical interpretation, as each component has the latent “life” within itself, and it is the role and responsibility of the architect to bring together the constituent pieces in a manner that reveals the living structure. The tools needed to achieve this unity lie within ourselves; we simply have to train

our minds and bodies to apply them. Architecture thus must become a very personal process.

Empirical evidence points to a world that connects with our self. Alexander, being a scientist himself, carefully leads us toward an understanding that there is nothing here that is inherently contradictory; it’s just that we need to put some things into a proper perspective. The twentieth century has seen tremendous scientific and technological achievements, which would not have been possible without an impersonal, value-neutral approach. Scientific research as we practice it requires an objective detachment from whatever we are doing. Industrialization, for better or worse, was founded on depersonalization. Alexander forces us to reconsider all this, and to ask if we have not lost something essential by depersonalizing everything in our modern world.

The emphasis on the quantitative aspects of life devalues the subjective experiences, those we describe as emotional, spiritual, aesthetic, or passionate. Such an emphasis has forced a psychological split in the process of perception. We have indeed “split” our souls by aligning our bodies and minds with the impersonal, unbiased objective of the scientific researcher. But unbiased does not mean insensitive, as Alexander has shown in his quest for a deeper understanding of the wonderful complexity of the universe. Consciousness is tied to certain configurations of matter; true coherence induces a kind of sadness in us; connecting in a fundamental way becomes a transcendental experience; the urge to life arises even within inanimate matter; creating coherent entities ourselves is an act that heals both our bodies and souls. When, in addition, one is forced to reconsider the Cartesian model of the universe, we find ourselves out on a proverbial or philosophical limb. It helps that, while Alexander was finishing his book, other philosophers and scientists were also beginning to question the Cartesian model.

Given one of the reviewer’s (N. A. S.) many years of association with Alexander and close involvement in this work, it might appear difficult to maintain a critical distance from the text. On the other hand, this also makes possible a personal testimony to the genesis of this most intriguing chapter in a career that spans thirty-five years. Here are some reminiscences:

In the middle of Book Four there is a long chapter on Color. I remember helping Alexander to edit these four volumes, and we couldn't figure out where "Color" best fit in. Every reasonable place he put it, it seemed somehow odd; out of place. Then I suggested that he put it in with the material on God. A crazy idea; but it worked. It felt right to me, and also to Alexander. When he pressed me for a justification, I said, tentatively: "Color is a very direct means of connecting with the unity you describe here; with the luminous ground. Everyone can experience this unity through a great painting, a stained glass window, or ceramic tile work, and in many cases much more easily than through structure." And so color helps to provide a tangible explanation of the connective process that drives human beings to build and to live.

Alexander is a brave man, who is unafraid to say something he believes in, especially if it can be verified. And yet, in early drafts of The Nature of Order, there were what I suspected to be profound thoughts hidden in footnotes and appendices. He was strangely reticent about this, and sounded concerned that the ideas might be misunderstood and even ridiculed. Some results he felt beyond a doubt were correct but could not be proved, and might compromise the rest of the book. I argued for all this material to be brought up front, and it now appears prominently in Book Four. Some of it cannot be empirically verified. That is certainly not a liability in this case. I told him then not to fool himself: "This stuff has shattering implications, and intelligent readers will recognize it for what it is; they will not ignore it simply because it is hidden in footnotes." Alexander has indeed seen beyond most of us and he is presenting his vision for all to contemplate. He is moreover careful to say what is empirically supported and what is not.

God is discussed throughout Book Four, and some readers may ask if this is appropriate in an architectural treatise. Alexander certainly did not begin by relying upon any particular religious doctrine; after all, he is a rigorous scientist. He was surprised when his own research repeatedly and insistently led him to theological questions. He discovered that there is a link between structure in the universe and what we otherwise call God. Much of humanity has accepted this as fact, but Alexander's conclusion is unique in that he arrived at this understanding as a result of intense and prolonged analytical thinking and inquiry.

It is more often in religious architecture and art that one finds the transcendental unity that is the culmination of human achievement. It is not the intrinsically religious nature of such structures that is important (because the actual religions that inspired them are totally distinct), but rather the inspired state of mind of the artist/architect. Inspired by his poetic soul and driven by his scientific mind, Alexander inhabits the text he presents to us as both shaman and sage, operating himself as the transcendental unity by which all fixed notions of reality are peeled away to reveal the luminous ground. It is Alexander's relentless quest for the basis of architectural form that led him to these conclusions. Not surprisingly, this book is a broadly cross-disciplinary study touching and unifying a vast range of knowledge in many different disciplines. Books One and Two are already becoming popular with computer scientists, and we anticipate that some or all of these results will eventually spark the interest of biologists, physicists, and engineers. Book Four will surely speak to the philosophers and theologians among us, making Alexander's work a major contribution toward "consilience," a term Edward O. Wilson coined to describe the merging and transition among different disciplines.

Alexander's ability to bring together and to unite not only thinkers from every place and time but also the two heretofore separate realms of conscious enquiry fosters a unification of knowledge. His contribution ultimately serves to expand humankind's perception of the world around itself. Book Four of *The Nature of Order* may well begin to reverse such isolating practices as those found in the studies of science, philosophy, and architecture. It shows that intellectual clarity, a passion for creative knowledge, and reaching out to embrace wisdom are characteristic of all advances of civilization, and are essential for its stability. As with all the great thinkers of our past and present—those whose work continues to resonate within our world—we believe Alexander's *The Nature of Order* will stir in the minds of students, scholars, and practitioners alike for centuries to come, providing a luminous ground on which to construct a new reality. □



REGENERATING ART AND ARCHITECTURE IN NATURE'S LANDSCAPE