



Environmental & Architectural Phenomenology

Vol. 33 • No. 2

ISSN 1083–9194

Summer/Fall • 2022

Special issue in memoriam

Architect Christopher Alexander (1936–2022)

Philosopher Robert Mugerauer (1945–2022)

In thirty-three years of publication, this issue of *EAP* has been the most difficult to produce. In the recent months of March and May, the phenomenological and architectural communities have lost two of their most insightful and generous colleagues: Architect **Christopher Alexander** and philosopher **Robert Mugerauer**. Alexander died in England on March 17 after a long, enervating illness. Mugerauer died on May 8, in a Seattle hospital after a debilitating battle with cancer.

Deeply saddened by these deaths so close together, I was at a loss as how to remember these men's huge professional and intellectual contributions to environmental and architectural phenomenology. Luckily for me, Alexander's colleagues, **Jenny Quillien** and **Richard Gabriel**, immediately set out to write essays about Chris, just as Bob's colleague **Ingrid Leman Stefanovic** quickly volunteered to contribute her recollections of Bob.

As editor, what I have attempted to do in this issue is to offer a range of commentaries and selections from Chris and Bob's work to indicate the remarkable sensibility and importance of these two thinkers. Bob will be remembered for his lucid, unflinching efforts to make phenomenological ideas accessible to academics and the lay public. Chris will be remembered for his brilliant constancy in exploring the qualities of genuine wholeness and transforming those qualities into architecture and design.

I have divided the issue in half. The first sections relate to Bob, including my introduction, Ingrid's moving remembrances, and three selections from Bob's many writings that indicate the clarity, heart, and good sense of his ecumenical thinking.

The issue's second half relates to Chris and includes my introduction, the essays by Jenny and Richard, and Chris's summary of his four-volume *Nature of Order*. This summary was first published in *EAP* in 2007 and is reprinted as a reminder of the magnificent, comprehensive power of Chris's masterwork. The last entry is a book note on *Shifting Patterns* (2019),

which overviews Chris's design of the Eishen School in Japan. We include portions of an interview with the school's Principal, **Hisae Hosoi**, who had the foresight and good luck to hire Chris as the architect of this extraordinary project.

We end the issue with a series of evocative photographs of the Eishen campus by Japanese photographer **Takeshi Kakeda**. These photos, including the image below, indicate the marvelous potential of architecture and design grounded in placemaking envisioned as wholeness. We thank Kakeda for allowing us to reproduce his excellent photos here. —*David Seamon*



Citations received

Anna Ulrikke Andersen, 2022. *Following Norberg-Schulz: An Architectural History through the Essay Film.* New York: Bloomsbury.

This architectural historian/filmmaker reconsiders the architectural and place phenomenology of Norwegian architectural theorist Christian Norberg-Schulz (1926–2000), best known for his 1980 *Genius Loci: A Phenomenology of Architecture*. Each of the book's ten chapters is accompanied by a short documentary film, available online and illustrating cinematically the chapter's key themes.

Elisabetta Canepa, 2022. *Architecture Is Atmosphere.* Milan: Mimesis [a volume in the "Atmospheric Spaces" series].

This Italian architect considers qualities of atmospheric experiences as related to architecture. The aim is a theory of architectural atmosphere grounded in phenomenology, neuroscience, and architectural principles.

Kimberly M. Dill, 2021. *Three Criteria for Environmental Authenticity: A Response to the Simulation Problem.* *Environmental Philosophy*, Vol. 18, No. 2, pp. 279–318.

This philosopher explains that "if we are in the not-so-distant future able to construct cross-modality replete simulations of biodiverse environments, then what reason would we have to conserve genuine, biodiverse ecosystems?" She argues that "the authenticity of biodiverse environments matters, both in itself and insofar as authenticity plays an important psychological, cultural, personal, and epistemic role in the lives of human agents." She highlights three "positive conditions" crucial for authenticity: (1) historical origins (the

thing arises genuinely through time); (2) connection to world (there is a match between what the thing seems and what it is); (3) relational role (the thing appropriately partakes in and supports "meaningful human and more-than-human relationships").

Dermot Moran, 2017. "Lived Body, Intersubjectivity, and Intercorporeality," pp. 269–309 in Luna Dolezal and Danielle Petherbridge, eds. *Body/Self/Others: The Phenomenology of Social Encounters.* Albany, NY: State Univ. of New York Press.

This philosopher aims "to articulate some aspects of corporeality and intercorporeality deserving further analysis." Key themes include "the physical body vs. lived body"; "bodily mine-ness"; "the technologically enhanced body"; and "the intertwining of the senses: Merleau-Ponty's 'chiasm'."

David M. Henkin, 2021. *The Week: A History of the Unnatural Rhythms that Make Us Who We Are.* New Haven, Connecticut: Yale University Press.

This historian considers the development of the seven-day week, arguing that the current taken-for-granted weekly pattern "emerged in the United States during the first half of the nineteenth century." Henkin claims that the week "is more than just a regimen of rest days or breaks from work, but a dominant organizational principle of modern society." He suggests that the seven-day week "shapes our understanding and experience of time." This work should be complemented with sociologist Eviatar Zerubavel's superb *The Seven-Day Circle* (Univ. of Chicago Press, 1985), which remains the most thorough and engaged "history and meaning of the week."

Lisa Heschong, 2021. *Visual Delight in Architecture: Daylight, Vision, and View.* London: Routledge.

Well known for her *Thermal Delight in Architecture* (MIT Press, 1979), this architect considers "the many ways that our lives are enriched by the presence of natural daylight and window views within our buildings." Heschong argues that "daily exposure to the rhythms of daylight is essential to our health and wellbeing." She details "the subtlety, beauty, and pleasures of well-daylit spaces and attractive window views," explaining "how these are woven into the fabric of both our everyday sensory experience and enduring cultural perspectives."

Phil Hubbard, 2017. *The Battle for the High Street: Retail Gentrification, Class and Disgust.* London: Palgrave Macmillan.

This geographer considers the social and cultural status of British High Streets, which "have long been understood to be the heart of many [English] communities but have declined to a state where boarded-up and vacant retail units are a familiar site in many British cities." Hubbard demonstrates that "policies deemed necessary to revive their fortunes are often thinly-veiled attacks on the tastes and cultures of the working class." He argues against retail gentrification and describes High Streets as illustrating "class conflict in austerity Britain."

Glenna Lang, 2021. *Jane Jacobs's First City: Learning from Scranton, Pennsylvania.* New York: New Village Press.

This writer argues that the eminent urbanist Jane Jacobs' understanding of robust cities "germinated in the city of Scranton, Pennsylvania, where Jacobs spent her initial 18 years. In the 1920s and 1930s, Scranton was a place of enormous diver-

sity and opportunity.” The author’s argument is intriguing, though probably overstated, since the historic evidence indicates that it was much more her writing for *Architectural Forum* and her observations of her Greenwich Village Hudson Street neighborhood that propelled her arguments in *Death and Life of Great American Cities* (1961) and her several other books on urban vitality.

Juhani Pallasmaa and Matteo Zambelli, 2020. *Inseminations: Seeds for Architectural Thought*. New York: Wiley.

This volume is another set of writings by Finish architect and architectural theorist Juhani Pallasmaa, best known for his 1996 *Eyes of the Skin*. Arranged alphabetically and mostly fragments rather than full-length essays, the entries include such topics as atmospheres, biophilic beauty, embodied understanding, imperfection, light and shadow, newness andnowness, nostalgia, and architectural phenomenology. Zambelli is editor of the entries and has translated and edited four of Pallasmaa’s books from English to Italian. See the sidebar, following, for Pallasmaa’s entry on “phenomenology & architecture.”

Phenomenology & architecture

Phenomenology strives to depict phenomena appealing directly to the consciousness as such, without any theories and categories taken from the natural science or psychology. Phenomenology means examining a phenomenon of the consciousness in its own dimension of consciousness. That, using Husserl’s concept, means “a pure looking at” the phenomenon, or “viewing its essence.” Phenomenology is a purely theoretical approach to research in the original sense of the Greek word *theoria*, which means precisely “a looking at.”

The phenomenology of architecture is thus “looking at” architecture within the consciousness, experiencing it

through architectural feeling. In contrast to the analysis of the physical proportions and properties of the building or a stylistic frame of reference. The phenomenon of architecture seeks the inner language of building.

There is, on the whole, great suspicion of an introspective approach to art because it is thought to lack objectivity. But people do not seem to demand the same kind of objectivity from the artist’s creative work. A work of art is a reality only when it is experienced and, experiencing a work of art means re-creating its dimension of feeling.

One of the most important “raw materials” of the phenomenology of architecture is early childhood memory. We are used to thinking of childhood memories as products of the naïve consciousness and precise memory capacity of the child, something with great appeal [but] with as little real value as our dreams. Both these preconceived ideas are wrong. Surely the fact that certain early memories retain their personal identifiability and emotional force throughout our lives provides convincing proof of the importance and authenticity of these experiences, just as our dreams and daydreams reveal the most real and spontaneous contents of our minds.

In an untitled and unfinished essay, presumably written in 1925, Alvar Aalto describes young boys at a party, selecting their candy by the color and shape of the wrapping, while the adults chose “candies of a touristy kind” with pictures of castles and villages. He argues that the young boys acted through an instant instinct of beauty, whereas the adult choices were purposeful. “There is hardly anyone who would deny that instinctive joy is the response to an aesthetic experience. It is related to all intuitive activity, the joy of creation and the joy of work. Unfortunately, modern man, particularly Western man, is so deeply influenced by methodical analysis that his natural insight and immediate receptiveness have been greatly weakened.”

The task of phenomenology of architecture is to survey the natural and innocent consciousness so directly observed by Aalto (pp. 187–188).

Nili Portugali, 2022. *And the Alley She Whitewashed in Light Blue*. Stuttgart, Germany: Edition Axel Menges GmbH.

This book is drawn from Israeli architect Nili Portugali’s award-winning feature film by the same title. As indicated by the book’s subtitle, the aim of the film and book is to explore “the secret of all those timeless places where one feels at home.” Portugali studied with American architect Christopher Alexander, and his point of view and manner of designing inform her designing, filmmaking, and writings. The book includes free-streaming access to watch the original film.

Edward Slavishak, 2022. *Collision Course: Rural Track Crossing Habits and the Railroad in the United States, 1915–32. Technology and Culture, Vol. 63, No. 1, pp. 209–33.*

This historian examines in detail two accidents between trains and people traversing train tracks, both in Pennsylvania in 1915 and 1932. He uses the resulting lawsuits, particularly trial reportage, to demonstrate that when some “travelers prioritized convenience on their daily trips, their shortcuts and hacks led to unexpected run-ins with dangerous machinery. In early 1900s rural America, pedestrians and motorists used railroad tracks carelessly and intentionally—a chaotic combination epitomizing the hustle and bustle of everyday life.” An interesting account of how taken-for-granted place routines can be severely disrupted by technology.

In Memoriam: Robert Mugerauer (1945–2022)

David Seamon, Editor, *EAP*

Philosopher **Robert Mugerauer** died on May 8, 2022, in Seattle, after a long battle with cancer. He was 77 years old. Bob completed his undergraduate education at the University of Notre Dame in 1967. In 1973, he received his PhD in philosophy from the University of Texas, Austin. In the early 1980s, he was Dean and Vice President at Austin's St. Edward's University.

Beginning in 1984, he taught in the School of Architecture and Community and Regional Planning at the University of Texas, Austin. In 2000, he moved to the University of Washington, Seattle, where he was Dean of the College of Built Environments from 2000 to 2006. He then became a Professor in that College until his passing.

I first met Bob at the 1981 inaugural meeting of the Society for Phenomenology and the Human Sciences (SPHS). My dissertation advisor, Anne Buttimer (1976), had participated in a special session on "place and space" at the 1980 Ottawa meeting of the Society for Phenomenology and Existential Philosophy (SPHS). After that event, Buttimer suggested I organize another session on the topic, this time sponsored by SPHS, which she explained had recently been formed and would hold its first annual meeting in 1981 in conjunction with SPEP.

Entitled "phenomenologies of place," that SPHS session took place at Northwestern University, in Evanston, Illinois. As I remember, session participants were Buttimer, psychologist Bernd Jager, and philosophers Joseph Grange and Mugerauer. That 1981 meeting was a crucial event in my professional career because I met Bob, who had become interested in phenomenological and hermeneutic work as it might provide insights

for environmental and architectural concerns. I had written a thank you note to philosopher Richard Zaner, explaining how valuable his book, *The Problem of Embodiment* (Zaner 1971), had been for my dissertation work (Seamon 1979).

I asked Zaner if he knew any researchers using phenomenology to examine environmental topics, and he mentioned an article by Bob, one of his former graduate students (Mugerauer 1981). I wrote to Bob, and he agreed to participate in the SPHS session on phenomenologies of place.

I still fondly remember sitting in a diner near the Northwestern campus, discussing phenomenological topics with him that I had never been able to discuss with anyone else. That meeting allowed me to picture a professional trajectory focusing on phenomenological research that would consider environmental, architectural, and place concerns not readily accessible via the analytic, quantitative way of study that, in the early 1980s, dominated Geography and other environmental disciplines and professions.

Because of that 1981 SPHS session, Mugerauer and I became good friends and over the years were involved in many joint efforts, including co-editing a volume, *Dwelling, Place and Environment: Towards a Phenomenology of Person and World* (Seamon and Mugerauer 1985), which became a seminal text in environmental and architectural phenomenology.

For several years after the 1981 meeting, Bob and I organized SPHS sessions relating to environmental, architectural, and place-making themes. *Dwelling, Place and Environment* incorporated many of those presentations, including entries by Buttimer, Grange, Jager, Mugerauer, and me as well as entries by

later SPHS presenters, including philosopher Michael Zimmerman, urban planner Fran Violich, and architects Botond Bogner and David Saile. There were other contributors to this edited volume (the text included seventeen chapters), but we would not have envisioned or edited the book were it not for our co-organizational efforts for SPHS sessions dealing with environmental and architectural themes.

For several years, Bob and I organized sessions on phenomenology for the Environmental Design Research Association (EDRA). In 1989, during a breakfast at EDRA with interior-design educator Margaret Boschetti, the three of us decided that there should be a regular information bulletin on phenomenological and related qualitative research relevant to research and practice in the environmental and design disciplines and professions. The result was *Environmental and Architectural Phenomenology*, a newsletter originally subsidized by EDRA and edited by Boschetti and me. In the first issue of *EAP* (winter 1990), Bob contributed a "conference report" on the 1989 SPHS and SPEP meetings held at Pittsburgh's Duquesne University. He wrote:

The fruitfulness of phenomenology [for environmental and architectural topics] was most apparent in exploring the existential fact that the environment is never given as a pure or brute fact (as positivism would have it) but, instead, is always already interpreted.

That environmental meaning is a holistic result of architectural, artistic and perceptual patterns means an inexorable intertwining between the dual tasks of: (1) environmental research and interpretation; and (2) architectural design.

Moreover, ... a phenomenology of architecture and environment has a primary responsibility to nurture wholesome modes of dwelling in a technological age.

Such a value-centered approach is not idiosyncratic or arbitrary, but a call we ignore at our own personal and professional peril (Mugerauer 1990, p. 5).

Strikingly, in this succinct conference summary, Bob pointed to key themes that his later writings would emphasize, particularly the complex matter of recreating dwelling in our difficult postmodern age, so infiltrated by human and environmental discombobulation (e.g., Mugerauer 1993, 1994, 2008, 2014).

In the early 1990s, I became editor of a book series, “Environmental and Architectural Phenomenology,” sponsored by the State University of New York (SUNY) Press. I asked Bob to provide a book proposal, which eventually became his superb *Interpretations on Behalf of Place*, a volume that remains one of the clearest and most practicable discussions of how phenomenology might contribute to design and planning praxis in the present-day world’s uncertain, unsettling times.

In the book’s second part, “Practical Directions,” Bob considered how our postmodern world might take responsibility for the technological landscape that dominates places today. He asked how practitioners might make places that support wholeness and mutual regard as, at the same time, they allow for multiple world views. His solution is what he called *fitting placement*—a style of understanding, designing, planning, and policy-making that respects and responds to the inescapable presence of technology in our world, yet encourages the continuance of strengthening local peoples, places, and landscapes.

I always admired Bob because he instinctively had a sense of the underlying philosophical currents moving through our time. In *Interpretations on Behalf of Place*, he placed phenomenological work in the broader intellectual landscape by pointing to critics on both the “right” and “left” (Mugerauer 1993, pp. 94–95).

On the right, he placed the positivists, whose ability to garner research monies continues to mark the real power source in universities today. These researchers

see phenomenology as “subjective,” “soft,” “anecdotal,” and “interesting but useless practically.” On the “left” he placed the poststructuralists, social constructionists, post-phenomenologists, and “critical” thinkers, who question phenomenology’s attention to commonality, continuity, wholeness, order, and truth.

In phenomenology and hermeneutics, Bob saw a *middle way* between the physicalist, reductive absolutism of positivism, on one hand, and the cynical, subjectivist relativism of poststructuralism, on the other. This middle way is possible, Bob emphasized because—in its efforts to see and understand human experience and meaning in a kindly, open way—phenomenology strives for a balance between people and world, researcher and phenomenon, feeling and thinking, and experience and theory. This effort toward balance, he argued, is crucial “if we are to adequately understand, plan, and build a socially pluralistic and ecologically appropriate environment” (Mugerauer 1993, p. 94).

I cannot emphasize enough the central role that Bob played in my personal and professional development. Other than Ingrid Leman Stefanovic, Bob is one of the few philosophers I have known who sincerely saw value in and mastered the environmental, geographical, and architectural literatures. Philosophers Jeff Malpas and Ed Casey are similar in their openness, and the work that we have all done together (though mostly apart) points to the hopeful possibilities of thinking about, envisioning, and making better worlds, partly through place and exuberant placemaking.

Bob was unique professionally in the way he sought out individuals from other disciplines and professions; mastered their thinking, literatures, and practical efforts; and readily drew their work into his writings. Bob was a singular, magnanimous thinker, and I will hugely miss his encouragement, envisionings, and writings.

The advice I think he would give to younger researchers, particularly would-be philosophers, is as follows: Study his work to see how personal integrity and clear thinking can ground selfless efforts that are *real and useful*. God knows how

this engaged manner of thinking is desperately needed in the world today as philosophy and other academic disciplines mire themselves in the useless, cerebral muddle of poststructural and “critical” thinking.

May the “good sense” of phenomenology return, and I’m certain Bob would agree. In his honor, we publish a memorial essay by Ingrid Stefanovic and portions of three of his writings—“Language and the Emergence of the Environment” (1985); “Derrida and Beyond” (1988); and “Toward an Architectural Vocabulary” (1993).

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Dr. Bob: Forever a Good Friend

Ingrid Lemn Stefanovic

Stefanovic is Professor Emerita, University of Toronto; and Professor and Dean Emeritus, Simon Fraser University. Her books include *Safeguarding Our Common Future: Rethinking Sustainable Development* (2000); *The Natural City* (2015); and *The Wonder of Water* (2020). www.ingridstefanovic.com; ingrid.stefanovic@utoronto.ca. © 2022 Ingrid Lemn Stefanovic.

The comfort of having a friend may be taken away, but not that of having had one.

—Seneca

Ingrid, old friend! How great to see you!”

These words from Bob Mugerauer greeted me in my hotel lobby in Seattle just a few short years ago, as he administered a big bear hug to my husband and me. He had changed since we had last seen each other—he seemed more frail—but his laugh, the warmth in his eyes, and his boisterous love of life were still so much a part of his persona. He and his wife, Monika, hosted us for dinner in their beautiful home overlooking a vista of natural beauty of the water and urban form below. The evening was quite memorable.

Since then, Bob and I have collaborated on a few book projects. In 2020, he contributed a chapter, “Towards a Complexity Ethics: Understanding and Action on Behalf of Life-World Well-Being,” to my edited collection, *The Wonder of Water* (University of Toronto Press, 2020). Focusing on the case of the Lower Duwamish Waterway that runs down Washington’s Cascade Mountains to Puget Sound and Seattle, he illustrated how broadly one must look to pragmatically address the complexity of ethical challenges around this riverbed.

On the one hand, the waterway is seriously polluted, so much so that “no matter how much remediation cleans up the river, the water will never be safe to swim in or drink; the fish will never be safe to eat” (Mugerauer 2020, p. 216). But the ecological challenges also reflect health impacts: South Park residents along the river’s edges have, statistically speaking, a life expectancy eight years shorter than the county average and thirteen years shorter

than an affluent community situated nearby along Lake Washington.

Through complex positive and negative feedback loops, the “bad biochemical environment” is “the scene of a high crime rate, high unemployment, low property values, and marginal infrastructure and services” (p. 217). Both short- and long-term, the ethical challenges “run in many directions” (p. 218), all of which means that an “ethics of complexity” needs to address fundamental existential networks and embodied, emotional, caring relationships often exceeding even the most sophisticated cost-benefit analyses.

In such a scenario, the ethics of water should focus less on individual components and more upon the complex responsibilities communal in nature, reflecting concerns of “many who are concretely engaged together in the world, across the arc of life ... in terms of an ethics of complexity and shared life-world (*in-der-welt-mitsein*)” (p. 229).

I encourage readers to explore Bob’s chapter because it illustrates his remarkable ability to provide nuanced, phenomenological readings of place and make them legible even to a lay reader.

More recently, Bob wrote a chapter for my edited volume, *Conversations on Ethical Leadership: Lessons Learned from University Governance* (University of Toronto Press, forthcoming). His chapter addresses “The Art of Having the Right Thing Happen.” Drawing from Aristotle and Gadamer’s writings on *phronesis*, Bob provides a series of lessons learned from his days as Dean and Provost at two different universities. He provides wonderful stories to illustrate each lesson that he pretends to be offering a colleague who is stepping into an administrative role for the first time.

As someone who has spent almost half of my university career in some form of administrative position, from Associate Chair to Dean, I enjoyed reading and relating to Bob’s narratives and his words of wisdom. One piece of advice suggests that we “do as much as possible outside (and prior to) formal structures,” ensuring that we privilege our humanity over bureaucracy. “Do not force things by evoking your authority,” he counsels, so much sounding like the gentle, kind Bob we knew. As he closes the chapter, he notes that his lifelong task, his “guiding star, steady in my own experience and thinking, does agree with at least one thing [philosopher Baltasar] Gracián says in his *Art of Worldly Wisdom*: ‘See to it that things end well’.” Indeed.

I want to say a final word about a chapter that Bob wrote many years ago for David Seamon’s edited volume, *Dwelling, Seeing, and Designing*. Entitled “Toward an Architectural Vocabulary: The Porch as a Between,” Bob writes in this chapter that the porch serves as a “mediating place between house and exterior ... a *lingering* between inner and outer spheres.” (Mugerauer 1993b, p. 105, p. 107). Describing different sorts of porches, from frame houses to mansions to student unions, he illustrates how porches emphasize a spatial between that enables gathering and lingering. He writes that “The porch marks a threshold,” as it “joins different worlds” (p. 119).

It’s a moving chapter—I’ve rarely read such a thoughtful piece about the architectural form of porch anywhere else. This chapter reflects Bob’s ability to see, to interpret, and to share his love of lived spaces. Whenever I am seated on the porch at my son’s beautiful home, I can’t help but think of Bob’s chapter.

Certainly, there are other of his writings that merit our accolades, including *Interpretations on Behalf of Place* (Mugerauer 1993a), *Interpreting Environments* (Mugerauer 1994), *Heidegger and Homecoming* (Mugerauer 2008), and *Responding to Loss* (Mugerauer 2014). All of Bob's many publications speak to his approach to life: He was sensitive, humble, insightful, knowledgeable, and collaborative—so appropriate to a genuinely phenomenological calling. He was a good soul, a wonderful teacher, and an exceptional friend. And he could always make you laugh. His own email address—drbobm@uw.edu—always made me chuckle.

Henry David Thoreau counseled that “on the death of a friend ... we have henceforth to fulfill the promise of our friend's

life also, in our own, to the world.” To honor our friend, Bob Mugerauer, I would hope we each look for ways to take his kindness, his love of life and learning, his appreciation of life's complexities, his phenomenological insight, and his humility forward in our own work. It's a big task but one that he amply deserves.

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Language and the Emergence of Environment

Robert Mugerauer

This excerpt is from Robert Mugerauer 1985, Language and the Emergence of Environment, Chapter 4 in David Seamon and Robert Mugerauer, eds., Dwelling, Place and Environment: Towards a Phenomenology of Person and World, Dordrecht: Martinus Nijhoff, pp. 51–52 and pp. 66–68.

Environment, it would seem, is well understood Because the matter is complex, however, I would like to inquire, more basically, how it is possible that we sensuously experience and perceive the environment and then scientifically study both that experience and the environment itself.

I argue that scientific knowledge of environment is possible only because there is a prior experience in which the environment appears as holistically intelligible. We always find ourselves in the midst of an already interpreted environment; from this placement we both deepen our understanding and make mistakes. Further, both the primary interpretive experience and the secondary scientific abstraction are themselves possible only because *the environment and people always and already are given together in language.*

Such a claim in no way denies the importance of environmental knowledge gained through a study of sensory experience; it only points out that we first encounter environment as what stands around us, already interpreted and understood by way of language. Our topic, therefore, needs to be environment and the experience of language, or, language and the emergence of environment.

This chapter explores how mistaken assumptions underlying the common views of environment and language render these views theoretically and practically inadequate. By thinking through instances where both realism and idealism fail to provide the necessary understanding and instances where we fail or succeed to encounter language and environment existentially, one can specify the manner in which language and environment belong together and dwelling is possible.

As a result, one can find a more fundamental position from which to describe and interpret the phenomena of language and environment. One can show how language enables environment to emerge, which also enables us better to understand the places

and manner in which we attempt to dwell....

Environmental hermeneutics

The environmental disciplines need to investigate further, as a foundational issue upon which their possibility rests, how it is that person and environment are both given together in language. Indeed, often it is hardest to see what is most obvious because it is such a profoundly assumed basis for our experience. We are so sophisticated as scientists in directly interpreting and thus experiencing the environment that we proceed without noticing the epistemological and metaphysical foundations of our perceptions.

We jump in describing, sorting, analyzing, and synthesizing mountains, rivers, meadows, and so on. We lose sight of the fact that this work proceeds at a secondary level—it is a secondary abstraction from the environment in the midst of which we live without reflecting ...

We do science by analyzing in greater detail and at a different level what we are in the midst of—which is what is given to us as subject matter. We forget, even as scientists, that the subject matter we analyze—environment—already is given to us and interpreted in language. Thus, environmental disciplines are possible only insofar as they critically work from our historical interpretation of environment, which itself is possible only insofar as mountains, rivers, meadows, and the rest already show themselves, in language, to us as they are.

Such a fundamental area of study is not what has been done earlier as a result of either “realist” or “idealist” methodologies. Where environmental disciplines see language as *reporting* environmental features or the spatial patterns of cultures in an environment, what follows is analysis and correlation of those relationships and patterns. Where these disciplines see language and culture as creating the environment as a meaningful system, they systematically correlate language-symbolic-cultural

forms and spatial environmental descriptions and meanings....

Since language enables us to hold a basic interpretation in mind, we can proceed from there to different scientific interpretations, including the critical retrieval of other and earlier cultural environments. We call this new science that is beginning *hermeneutics* or, more specifically, *environmental hermeneutics*.

Environmental hermeneutics is the interpretation of the essential ways in which (1) human-cultural ways of dwelling and (2) essential features of environment occur historically, for specific places and languages, for specific regions and dialects. This new study would be not only a mapping, no matter how correct or complex, but even more importantly, a new regional-dialect discipline that would interpret the emergence, persistence, and changes of the relationships of language-scape and landscapes (and other dimensions of culture and environment).

Such an approach is difficult to explain briefly and adequately. What really is required is undertaking the project in classes, workshops, and research papers. At least, though, it is possible to specify some basic characteristics of this new way of interpretation. One can indicate at least four dimensions.

1. Environmental hermeneutics entails *understanding what a specific “local” language is saying*. Though we might begin by mapping differences in word usage, it is not adequate in the end with a mere listing and classifying, but with a reflective listening to the saying of environment, where we work out the meanings as carefully as we would for a great poem or novel.

2. Environmental hermeneutics involves understanding the ontological aspects of the language event. In addition to and beyond the interesting, idiosyncratic, and expressive aspects of language understood by way of sociology and psychology, and apart from the categorical knowledge

of linguistic science, the primary subject-matter of environmental hermeneutics is *the being or reality of environment*—whether natural or cultural. The goal is understanding the essential environmental characteristics that are disclosed and concealed by local language. The focus is not on environment in general, or on homogeneous space, but on particular regions, places, and environmental features.

3. Environmental hermeneutics goes on to *describe the essential features of the environment* that shows itself as it is (or fails to, insofar as it remains concealed). Also, care is taken to *describe the way in which this happens for a particular language*. Such a project must be scientific in the sense of a theoretically grounded craft practiced by a community of master interpreters who are also learners—a community that can critique, refine, and share their understanding with each other and with students.

4. Environmental hermeneutics insists that *the first three emphases must be allowed their historical dimension*. Fuller interpretation and understanding are possible

only where it is recognized that, over time and in different epochs of language, essential features of environment are both disclosed and concealed in complexly intelligent ways. “Mountain,” for example, may in different historical languages, enable mountains to emerge as the scene of paradigmatic actions of the gods, as a despicably desolate and humanly useless track, as the creation and sign of the Judeo-Christian God, as a material object to be known by scientific method and manipulated with technology, as an exquisite source of sublime feelings, as a sign of God’s favor and blessing on a people and nation, as a reservoir or stockpile of raw material, as a place where the earth stands firm and endures for mortals, and so on. In these larger historical-linguistic contexts, the features we name “gorge,” “ravine,” “shale,” “pine,” and so on, take on vastly different meanings and possibilities

Taken together, these four dimensions of environmental hermeneutics indicate how it is that language enables the environment to come forward

into experience. It is clear that understanding environment by way of language is part of a change that puts a renewed focus on such themes as place, dwelling, and regional geography. In this regard, an environmental hermeneutics would be both an area of specialization in itself (as a regional-dialect discipline proper) and a foundation for other areas of environmental study.

Hence, its peculiar local character: environmental hermeneutics concentrates on and illuminates its own special concerns. At the same time, it does so precisely because it gathers together a variety of approaches currently practiced in philosophy, literary criticism, geography, architecture, regional planning, anthropology, traditional studies, art history, and history of religion.

In the end, environmental hermeneutics would be the gathering place where we could see how environment emerges and can be understood.

“Recovering a genuine belonging with reality and truth”

Robert Mugerauer

This excerpt is from Robert Mugerauer, 1988, “Derrida and Beyond,” Center, Vol. 4 [special issue on “buildings and reality”], pp. 66–75. Austin, Center for the Study of American Architecture, School of Architecture, University of Texas, Austin. The following passages are on p. 66 and pp. 74–75.

What do buildings and reality have to do with one another as we enter the last phase of the modern era?

We might suppose that buildings themselves, unlike, say, stories, are quintessentially real, that they have a meaning we can discover, or that they embody something you can count on. But over the last hundred years, a line of Postmodernist theorists and critics have contended that such “naïve” beliefs misconstrue the situation. Indeed, French philosopher Jacques Derrida now appears to be completing the project that Frederick Nietzsche began: the nihilistic and subjectivistic devaluations and annulment of what traditionally has been taken as the truth about reality.

According to the now dominant view, our culturally built world is a desire that imposes itself as a false comfort and oppression. *Our posturing takes the form of pretending that there is some permanent transcendental-metaphysical reality to be known, whereas there is not.* Consequently, since access to any objective, privileged meaning is illusory, philosophical or scientific truth is unmasked as a kind of error.

Art alone suffices to retain and enhance the power we desire to unfold for ourselves, while simultaneously freeing us from the tyranny of deceptions of “objectivity.” Therefore, architecture, as an embodiment of will and meaning, can function both to avoid the error of posturing values and to prescribe for itself the environment that increases our power and satisfaction. For instance, the architectural gestures of Peter Eisenman, Coop Himmelblau, Emilio Ambasz, and I.M. Pei are Postmodern and radical precisely because they *deconstruct* “naïve” assumptions about buildings and reality [later in this article, Mugerauer discusses the work of these four architects/architectural teams].

The question then, of the relation of buildings and reality becomes the question of whether Postmodern architectural processes and buildings can escape the realm of reality-as-convention by becoming unreality and, in some sense, free. Or, insofar as they successfully embody new conventions of discourse, will they inevitably arc back to pose as new realities?

The postmodern condition and the future

It seems that in the Postmodern era the task of thinking and building is to remain free from “naïve” illusions. Not only our modes of discourse but the very built environment, whether woven by gestures of the media or architecture, are fictions for which we need to take responsibility. The cultural project is to renew the coming of fresh meaning by elevating process over object, so that buildings become interpreted and used as critical events.

The architect’s task is to devise strategies whereby we hold off a building’s reification and concretization as conventional meaning systems. Even if we know that in the end we will fail to hold, the goal is to keep deconstructing and reconstructing, forever weaving our environment afresh.

The freedom from the illusion of the metaphor and metaphysics of presence, both in theory and philosophy, should be a permanent gain. The question of how to go on remains to be continually asked, however, since it is not clear how the act of deconstruction can persist.

How can deconstruction remain continuously an event? As we have seen, destruction is not enough; we must necessarily generate our own discourse and new conventions, which assume the position of being meaningful, in turn needing to be undone. Derrida acknowledges that his work, too, is a strategic fiction, which has no privilege and should not (could not, since

he is self-consistent) become a new presence. If Derrida is right, it would mean that the only available next move is through and beyond “deconstruction.”

Is there yet a way in our time to recover a genuine belonging with reality and truth? It would have to result from a deconstruction and overcoming of Derrida.

Heidegger and “unconcealment”

The strongest line of thinking for the task emerges from the work of philosopher Martin Heidegger, which shows how neither Nietzsche nor Derrida is radical enough! Because their inversions or metaphysical ideas still remain tied to the metaphysical system, they remain necessarily within its history, even as they approach its end. The task, according to Heidegger, is to move to the no-longer-metaphysical.

Heidegger agrees that the illusions of the past need to be displaced and stripped away. Yet, *against Derrida and Nietzsche, Heidegger contends that the revelation of the power of our fictive grasp of the world simultaneously conceals within itself—and from itself—the reality and truth of the natural and cultural world. The world itself need to be brought into “unconcealment.”*

In such a move beyond deconstruction, reality and truth are not understood as some reassembly after our disassembly of the false, posturing relations of sign and signified. Rather, Heidegger advances the interpretation of truth as the disclosure of the dynamic unfolding of natural, human, and sacred dimensions of the cosmos, somewhat like the best science. Further, according to Heidegger, it is possible to establish a genuine belonging with what-is-given-to-us, rather than an ironic or alienated relationship with it.

We can say yes to a self-releasement from the prison of willful power and purely fictive discourse; thoughtfully and responsibly, we can remain open to the possibility

of true dwelling and authentic building. Such openness calls for a new mode of building.

We could no longer build as in the past, nostalgically replicating historical forms; both Heidegger and Derrida would agree. Architecture, as a primal mode of interpreting the world, brings forth order, setting out an individual's place in nature and the community.

Harries' natural symbols

We have some hints as to what a post-deconstructive architecture would look like. To note one example, Karsten Harries calls for a recovery of architecture's natural symbols [1]. In our life as participants in the world, we have access to the meaning

of the body's matrix of motion and orientation, to the sense of boundary and center, of vertical and horizontal, darkness and light, of inside, outside, and between.

Because things do still speak to us, we can achieve an architectural vocabulary of doors, columns, roofs, and so forth, which is non-arbitrary. In its power to transform space into place, building could provide a dwelling place to transform space into place, building could provide a dwelling place where we could belong in a community, in a specific—regional—landscape.

The agreement that the best architecture must sweep away cultural posturing and nostalgia leaves us with the final—still open—questions: Is Derrida or Heidegger the more insightful about truth and reality?

Should building be deconstruction as Eisenman, Coop Himmelblau, Ambasz, and Pei indicate, or the attempt at recovery of place as Harries and others advocate?

Note

1. Karsten Harries, "Thoughts on a Non-Arbitrary Architecture," *Perspecta*, 20 (1983): 9–20; also see Karsten Harries, "The Voices of Space," *Center*, Vol. 4 [special issue on "buildings and reality"], pp. 34–49. Austin, Center for the Study of American Architecture, School of Architecture, University of Texas, Austin, 1988; Karsten Harries, *The Ethical Function of Architecture* (Cambridge, MA: MIT Press, 1997).

Toward an Architectural Vocabulary

The Porch as a Between

Robert Mugerauer

This excerpt is from Robert Mugerauer, 1993, "Toward an Architectural Vocabulary: The Porch as a Between," Chapter 6 in D. Seamon, ed., Dwelling, Seeing, and Designing (Albany, NY: State University of New York Press) pp. 103–105 and pp. 125–26.

Martin Heidegger's interpretation of building and dwelling provides a means to understand the nature of architecture and the possibilities of design vocabulary. Heidegger argues that the primal sense of "arche-tecture" is restored when it is understood as an opening that subsequently makes buildings and building possible (Heidegger 1971a, b, c). The "arche" in "arche-tecture" originally meant "first principle" or "first element." "Tecton," today echoed in "techne" and "technology," means making or setting into work. "Arche-tecton," then, refers to the first skill, primary craft, or chief work.

But what does "arche-tecton" say? Heidegger's language presents a rejuvenating directive: architecture, in actually setting its joining capacity into concrete work, accomplishes the opening of a site where the fundamental dimensions of reality can be gathered together. Architecture is a careful attention and response to what nature, people, and their sense of the sacred need to come forward into a vital and proper relationship—that is, into a *world*. These three dimensions must be mediated in appropriate historical and regional traditions (Heidegger 1971c, pp. 220–21).

According to Heidegger, architecture originally was the measuring that enables the opening for the cosmos and the fundamental placement of human life. This measure was a "meting out" and a "measuring of the between," which encompassed heavens and earth, divinities and humans (ibid.). Such an architectonic was the province of the gods, who humans emulated in their building by following sacred models. From this original sense, measure as design came to be identified with architecture. As the gods have given way to humans, and we have assumed almost entirely the power to measure, partaking in the measuring has emerged as a fundamental human task. We have inherited the responsibility to design appropriately, with care that all

the relevant dimensions are included and balanced. We need to think of architecture as the originary opening and measuring according to the appropriate standards so that we can live commensurately with the world. Since poetry was also a *techne* for the Greeks, we can adapt Heidegger's description of genuine poetry to architecture: "[architecture] as the authentic gauging of the dimension of dwelling is [a] primal form of building" (Heidegger 1971c, p. 227). Recovering this prototypical understanding would help architecture's primal power to continue as an original admission to dwelling.

Suppose, following Heidegger, we accept this language used to understand and practice architecture, so that architecture appears as the opening of sites. In this phrasing, design and building attune themselves to the use and needs of things and help gather the dimensions of the world. The question in regard to design vocabulary is, How to attend and respond appropriately to our traditional architecture and design elements as part of people's responsibility to provide an opening for future building and living? This question simultaneously asks about our concrete historical manner of living and the character of specific architectural elements, particularly how they are joined into a building and the mode to which they help a world unfold.

Developing a design vocabulary from the implications of Heidegger's approach agrees with the work already begun by Karsten Harries (1983, 1988), Christian Norberg-Schulz (1985), and Christopher Alexander (1977), all of whom focus on specific, traditional elements in the discussion of architectural language. Both Harries and Norberg-Schulz explicitly utilize Heidegger and, in many ways, Alexander efforts are implicitly Heideggerian.

Harries's view is that we need an architecture based on a natural symbolism. He

argues that designers might move toward a non-arbitrary architecture by patiently rethinking the fundamental dimensions of their buildings—for example, the essential nature of windows, doors, and roofs. Such basic elements, usually taken for granted, need to be explored according to their particular logic and mode of enabling human being-in-the-world to occur (Harries 1983, 1988)

Here, in a way somewhat like Alexander's [in *Pattern Language*], I explore *between* in terms of one architectural element—the *porch*. Whereas yard lies between house and neighborhood or nature, porch appears nestled between house and yard (Mugerauer 1986). The Midwestern and Texas porches with which I am familiar provide the empirical basis for this project.

Other versions of the porch are considered insofar as they methodologically contribute to the phenomenological reduction, which aims to analyze and describe the essential characteristics of the Midwestern and Texan porches. To look at the porch as part of a common environment does not imply that it is uniquely American. Still, according to current research, "porches in the American sense—that is roofed but incompletely walled living areas"—are rare in Europe (McAlester and McAlester 1986, p. 52).

What would a phenomenological approach say about the porch as a distinctive element of an American architectural vocabulary and about architecture as opening for the world?

Porches disclose themselves as the scene of the gift of admittance and meeting. It is because of this admittance and meeting that people linger and enjoy themselves on the porch. "Gift," "admittance," and "history" are deeply related in Heidegger's thinking. "Mittance" means to give permission to enter into a place or

one's fellowship. "Admittance" refers to acceptance and reception. The household grants entry to others by way of the porch and, in turn, is granted the company of people and environment. Further, the porch's specific mode of gift and admittance help us to understand how architecture is a historical opening of sites for human dwelling.

According to Heidegger, the giving of admittance never happens once and for all, nor through architectural elements that would somehow be unchanging. Rather, the giving occurs as a continual unfolding of diverse modes of being, brought about in part by epochal changes in buildings and interpretations of specific architectural elements.

Since architecture helps mediate our existence in natural and cultural contexts, it gives the gift of the between. This gift is

primal, not only because it was necessary to make our dwelling possible in the first place, but because to dwell now and in the future, we always need the gift anew.

In a continuous but changing manner, architecture gives what sustains us: sites for the establishment and cultivation of human worlds.

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In Memoriam: Christopher Alexander (1936–2022)

David Seamon, Editor, *EAP*

One day, when we have learned the timeless way again, we shall feel the same about our towns and we shall feel as much at peace in them as we do today, walking by the ocean or stretched out in the long grass of a meadow—Timeless Way of Building, p. 549.

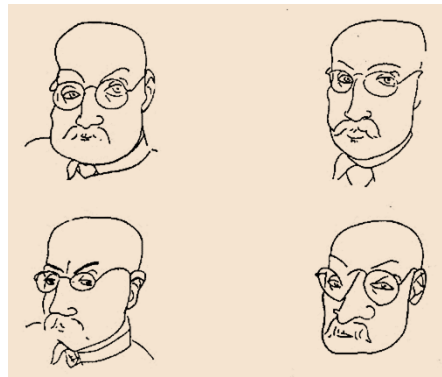
Architect **Christopher Alexander** died on March 17, 2022, in West Sussex, England. He was 85 years old and best known for his many books on understanding and making wholeness, including *The Timeless Way of Building* (1979), *A Pattern Language* (1977), and his four-volume masterwork, *The Nature of Order* (2002–2005).

Alexander was prolific as an architect and designed more than a hundred buildings, including a homeless shelter in San Jose, California; the West Dean Visitors Centre in West Sussex, England; and the Eishin School near Tokyo, a college and high-school campus. This superb project is presented in Alexander's last book, *The Battle for the Life and Beauty of the Earth* (2012), perhaps his most outspoken and insistent writing.

Alexander was born in Vienna, but his family emigrated to England when World War II began. He studied at Trinity College, Cambridge, earning a bachelor's degree in Architecture and a master's in Mathematics. He then did doctoral work at Harvard University, where in 1963 he earned the first PhD ever awarded in Architecture. That dissertation was eventually published as *Notes on the Synthesis of Form* (1964), a distant prequel to *Pattern Language*.

For most of his professional life, Alexander was a Professor of Architecture at the University of California, Berkeley, where he taught, wrote, and practiced architecture. Alexander received many awards, including the American Institute of Architects' inaugural Medal for Research (1972); selection as a Fellow of the American Academy of Arts and Sciences (1996); and the Vincent Scully Prize (2009).

In 1967, Alexander co-founded the Berkeley-based nonprofit Center for Environmental Structure (CES), the archi-



tectural firm via which most of Alexander's buildings and other designs were envisioned and constructed. Alexander was one of the few American architects who also had a contractor's license.

Alexander's thinking, envisioning, and designing is encapsulated most succinctly in his understanding of wholeness, which he defined in *Nature of Order* (Vol. 1, p. 90) as "the source of coherence in any part of the world." He associated wholeness with other related qualities, including comfort, freedom, health, healing, vitality, and life.

One of the most penetrating depictions of wholeness is his account of four self-drawings by artist Henri Matisse (figure, above). Though each of these depictions is literally different, there is an underlying commonality that speaks to Matisse's personality and character. It is this ineffable, less visible "ambiance" and "presence" that for Alexander marked the core feature of authentic wholeness, which he sought to clarify in his writings and make in his buildings. He wrote:

[Wholeness is] the overall vector, the overall qualitative structure, the overall field effect of the face.... [We see that] wholeness is a global thing—easy to feel, perhaps, but hard to define. You cannot get the portrait of a person right unless you can see this underlying wholeness ... In portraiture, as in architecture, it is the wholeness that is the real thing that lies

beneath the surface and determines everything (Nature of Order, Vol. 1, p. 98).

As illustrated by this description, Alexander's understanding of wholeness speaks to an indivisible, intensive connectedness—what he describes in the passage as an "overall vector—that runs "beneath" the drawings' markings and integrates them into an underlying "togetherness" globally present but impossible to pinpoint or describe precisely, even though the visual result is a trenchant portrayal of Matisse as a personality and unique person.

In his efforts to understand wholeness more thoroughly, Alexander generated a remarkable theory that he variously described as "pattern language," "the timeless way of building," "the quality without a name," "the nature of order," and "wholeness-extending transformations."

Particularly important to his understanding of wholeness was the concept of *center*, which he defined most broadly as any spatial concentration or organized focus of more intense pattern or activity—for example, an intricate carpet pattern, an elegant entryway, a handsome arcade, a gracious building, or an animated plaza full of users finding pleasure in the place.

Whatever its specific nature and scale, a center is a region of concentrated physical and experiential order that provides for an intense spatial and lived relatedness among things, people, situations, and events. A center is "an organized zone of space ... which, because of its internal coherence, and because of its relation to context ... forms a local zone of relative centeredness with respect to the other parts of space" (*Nature of Order*, Vol. 1, p. 84).

A pivotal question for Alexander is how an understanding of centers might help architects to actualize vigorous places and environments that sustain thriving human life. As he explained:

Wholeness is made of centers. Centers appear in space. When the wholeness becomes profound, we experience it as life, in buildings and other artifacts, in nature, even in actions. The life is able to be more profound or less profound because the centers themselves have different degrees of life, and the life of any one center depends on the life of other centers. The life of a building thus comes about as a recursive phenomenon in which different centers prop each other up and intensify their life cooperatively. [This spatial coordination] is responsible for the functional life in a building (the way it works) and for the geometric life (its beauty). These are one and the same thing (*Nature of Order*, Vol. 1, p. 314).

In Alexander's memory, we reprint several passages from *A Timeless Way of Building* (1979). Following, we reprint Alexander's essay first published in a 2007 issue of *EAP*, two years after the last volume of *The Nature of Order* had been published. This essay is a summary of that four-volume work.

We also include two essays relating to Alexander—the first by anthropologist Jenny Quillien; the second by computer-science researcher Richard Gabriel. We end by providing a book note on *Shifting Patterns*, a volume originally published in German and discussing Alexander's remarkable Eishen School, a combination college/high school near Tokyo, Japan.

Sustaining wholeness

Places that have [a quality of wholeness] invite this quality to come to life in us. And when we have this quality in us, we tend to make it come to life in towns and buildings that we help to build. It is a self-supporting, self-maintaining, generating quality. It is the quality of life. And we must seek it, for our own sakes, in our surroundings, simply so that we can ourselves become alive (p. 54)

This quality [of wholeness] can only come to life in us when it exists within the world we are part of. We can come alive only to the extent the buildings and towns we live in are alive. This quality without a name is circular: it exists in us, when it exists

in our buildings; and it only exists in our buildings, when we have it in ourselves (p. 62).

The routine events of place

If I consider my life honestly, I see that it is governed by a certain very small number of patterns of events that I take part in over and over again. Being in bed, having a shower, having breakfast in the kitchen, sitting in my study writing, walking in the garden, cooking and eating our common lunch at my office with my friends, going to the movies....

There are surprisingly few of these patterns of events in any one person's way of life, perhaps no more than a dozen. Look at your own life and you will find the same. It is shocking at first, to see that there are so few patterns of events open to me.

Not that I want more But when I see how very few there are, I begin to understand what huge effect these few patterns have on my life, on my capacity to live. If these few patterns are good for me, I can live well. If they are bad for me, I can't (pp. 67-68). ... we must recognize that what a town or building is, is governed, above all, by what is happening there Activities; events; forces; situations; lightning strikes; fish die; water flows; lovers quarrel; a cake burns; cats chase each other; a hummingbird sits outside my window; friends come by; my car breaks down; lovers' reunion; children born; grandparents go broke ... My life is made of episodes like this. The life of every person, animal, plant, creature, is made of similar episodes. The character of a place, then, is given to it by the episodes that happen there ... (p. 62).

The life of a house, or of a town, is not given to it, directly by the shape of its buildings, or by the ornament and plan—it is given to them by the quality of the events and situations we encounter there A building or a town is given its character, essentially, by those events that keep on happening there most often (p. 65, p. 66).

Each pattern a field

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 (p. 223).

Integrating parts and whole

It is only possible to make a place that is alive by a process in which each part is modified by its position in the whole ... In short, each part is given its specific form and its existence in the context of the larger whole The form of the whole and the parts come into being simultaneously (p. 369, p. 370)

When a pattern language is properly used, it allows the person who uses it to make places that are a part of nature because the successive acts of differentiation which the patterns defined are ordered in such a way that at each new step new wholes are born, infinitely various because they are adapted to the larger wholes in which they sit and with the parts between the wholes themselves whole, because the acts of differentiation have made them so (p. 374).

You can only use these patterns if you are willing to combine the discipline they give you with the spontaneity and immediacy of direct experience. You cannot create a design by patchwork, on pieces of tracing paper. You can only create as if it were a real experience of a real building: and that you can only do in your mind It is only in the mind's eye, eyes shut, not on paper that a building can be born out of the vividness of actual experience" p. (423).

Empirical Findings from “The Nature of Order”

Christopher Alexander

Originally published in the winter 2007 issue of *EAP*, this essay was Alexander’s effort to distill the major discoveries in his four-volume *The Nature of Order* (2002–2005), published by the Center for Environmental Structure in Berkeley, California. He thanked Maggie Alexander and Randy Schmidt for helping to edit this essay. © 2007 Christopher Alexander; © 2022 Maggie Alexander.

I am a scientist. The science of the last four centuries and especially the science of the last 150 years has profoundly shaped our culture and our civilization. We are now living in a world defined by a widely accepted group of statements and kind of knowledge that was non-existent before. These have changed our view of what a human being is. The offshoots of science have changed how we look at ourselves, how we think and feel, and how we view our social institutions, political institutions, love, war, and race. How we view children and how we view old age. How we view art and the making of things. How we view the birth and death of the cosmos.

Yet in this exuberant and fascinating surge of modern science, with all its authority and power, the divide between fact and value remains hardly changed at all. The questions of what we ought to do, how to solve problems, how we may attain the peaceful form of existence in which a person lives with quiet in one’s heart, how to act to protect the planet, how to act to protect and help the wretched of the Earth, how to bring loving kindness into the workplace—these issues have hardly changed. If anything, they have become more extreme, and every day more painful.

Science rarely helps us with these matters. We scientists have not yet laid down a way of thought that gives us a foundation of careful and tender action that deals with everyday life, makes common sense, and leads to actions that make the Earth more whole in its people and in its soil and substance. Indeed, the philosophy of science, which has brought us so far, has also made it more difficult to address these issues. The findings of science have intentionally separated the process of forming mechanical models of physics from the process of feeling and from appreciation of the poetic whole that forms our own existence.

In brief, then, we have not yet found a model through which we may understand things in an overall, wholesome way that is both rooted in fact, as deciphered by scientific effort, and gives us a foundation for ethical daily thought and action. As a result, to put it bluntly, *we do not know who we are*. We can hardly act without floundering morally or emotionally. Often, we find ourselves in the greatest pain because things do not hold together. We cannot find a comfortable picture of our daily actions in relation to the larger whole of the Earth and universe.

In *The Nature of Order*, a four-volume work mainly written in the thirty years from 1975 to 2005, I have tried to construct a coherent picture that makes sense of these matters and gives us something worth living for. How does *The Nature of Order* work? First, although the book is long, it is modest in intent and deals with something so ordinary that most scientific works never touch it—namely, the everyday world around us, the world of rooms and streets, houses and trees. The four books of *The Nature of Order* continually try to describe our everyday world in objective terms, yet at the same time deal with the emotional world that this objective, ordinary world raises in all of us. It is an exploration of the way that we sentient, feeling creatures interact with our surroundings, and of the way that interaction leads us to understand ourselves and the nature of our lives, and ultimately even to understand, in part, the nature of our own souls.

At the heart of this exploration there is a logical and empirical thread of argument that may be viewed as the core of my four books and that establishes the necessity of a new view of ourselves in relation to the world. This view ultimately nourishes (and, if accepted, could become the foundation of) a new kind of hope that is profound because it integrates knowledge from philosophy, science, and religion to help us to experience the wholeness of the whole. It could even shed light on the way wholeness occurs in the universe so that we might find help wrestling with the question of God. It might give us a path for our own access to that mystery, yet couched in acceptable, concrete terms of scientific reference.

The sequence of my argument follows a brief introduction to each of the four books and is arranged, as the books are, in four parts.

Book 1: “The Phenomenon of Life”

To lay a groundwork for understanding built environments that support human well-being, I began about 40 years ago, searching for, defining, and identifying patterns of space that recurred in buildings, each one dealing with a particular range of problems that was likely to occur. By about 1975, these investigations, which I undertook with five colleagues, gave us gold. We discovered about 250 invariant spatial patterns, each one associated with the stability of a human-environmental system. These were published in *A Pattern Language* (Oxford University Press, 1977) and in several other books published in the same decade. They have become a standard part of what is known and used by architects.

During the late 1970s and early 1980s, I began to notice that these 250 patterns were themselves special cases of a small number of much deeper configurational properties. I began to hunt for these and try to purify them. In the end, after ten years of work, I had identified fifteen of these properties. It began to seem more and more certain that all living structure—indeed, all “good” structure—is composed of these fifteen fundamental properties. It is significant that these fifteen properties are not confined to buildings and works of art but are equally visible in nature. In naturally occurring physical systems, one could see that virtually all phenomena had, in one form or another, a configuration that was “composed” from, or at the very least strongly molded by, these fifteen properties.

My co-workers and I began to feel that there was, in these phenomena, a recurrent structure of some kind—almost as if one could see the same deep structure in a huge variety of actual phenomena, and that it was so deep that each time it occurred, it took a different form, and was, nevertheless, always the same. The argument of Book 1, *The Phenomenon of Life*, may be captured by the following results that summarize thirty years of observation and experiment.

1. A previously unknown phenomenon that may be called “life” or “wholeness” has been observed in artifacts. This quality has been noticed in certain works of art, buildings, public space, parts of buildings, and in a wide range of other humanmade things.
2. The idea of how much life is in things is objective in the sense of observation and is thus common to people of different inclinations and cultures. This is a surprise, since the finding seems to contradict the accepted wisdom of cultural relativity. (demonstrated)
3. This quality of life seems to be correlated with the repeated appearance of fifteen geometric properties—or geometrical invariants—that appear throughout the object’s configuration. (demonstrated)
4. We began to refer to this quality, in its geometrical aspect, as “living structure.”
5. The appearance of living structure in things—large or small—is also correlated with the fact that these things induce deep feeling and a quality of connectedness in those who are in the presence of these things. (demonstrated)
6. Degree of life is an objective quality that may be measured by empirical methods. The empirical test that most trenchantly predicts “life” in things is a test that asks which of two things induces the greater wholeness in the observer and which of the two most nearly resembles the observer’s inner self. (demonstrated)
7. Astonishingly, in spite of the vast variety of human beings and human culture, there is substantial agreement about these judgments, thus suggesting a massive pool of agreement about the deep nature of a “human self” and possibly suggesting that we may legitimately speak of “the” human self. (at least strongly indicated)
8. The fifteen properties are the ways in which living centers can support other living centers. A center is a field-like centrality that occurs in space. (demonstrated)
9. In phenomena ranging in scale from 10^{-15} to 10^{-8} meters, on the surface of the Earth ranging from 10^{-5} to 10^5 meters, and at cosmological scales ranging from 10^9 to 10^{26} meters, the same fifteen properties occur repeatedly in natural systems.
10. There is substantial empirical evidence that the quality of buildings and works of art as judged by knowledgeable people who have the experience to evaluate quality with some objectivity is predicted by the presence and density of the fifteen properties. (demonstrated)
11. It is possible that the properties, as they occur in artifacts, may originate with cognition and work because of cognition, and that is why we respond to them.
12. But that cannot explain why they also occur, recur, and play such a significant role in *natural* phenomena.
13. Centers appear in both living and non-living structures. But in the living structures, there is a higher density and degree of cooperation among the centers, especially among the larger ones. This feature comes directly from the presence of the fifteen properties and the density with which they occur. (demonstrated)

Books 2 and 3: “The Process of Creating Life” and “A Vision of a Living World”

How does this living structure come into being? Where does it come from? And why do these structural properties keep recurring? It is more important to ask this question about the phenomenon in nature than in architecture, since in nature living structure is being created all the time, in architecture only sometimes. Yet it is a question that—in this form—has hardly ever been asked from within the mainstream sciences.

As a rule, scientists take it for granted that naturally occurring structures are beautiful. So much so, that the questions “Why?” or “How do things become beautiful?” do not usually seem important to a scientist and are rarely posed as

scientific questions. But when seen through the eyes of an architect or looked at in the scale range that I look at professionally, these two questions come into sharp relief. They are questions that need answers. When one looks at architecture and modern cities, it is obvious that human beings can manage to make a terrible mess of their surroundings. This shows us by default that beauty does not come about automatically. Yet in nature it does seem to come about without effort!

Evidently, then, we must conclude that there are particular kinds of processes occurring in nature that, repeatedly and without effort, make things beautiful. It must be that somehow these natural processes are constrained or specialized in some way that allows nature's phenomena to become beautiful, while the same particular specialization of process is missing from most contemporary architecture, planning, and development. It is not impossible for beauty to arise in human artifacts, but it is relatively rare.

What process is it that is universally present in the processes of nature but is rarely present—indeed, most often missing—from contemporary town building and architecture? This is a new and important scientific question. Having arrived at the description of the fifteen properties and seen them as vitally important structures in *both* nature and architecture, the question regarding good and bad process gave me a clue to the answer, especially since both nature and the best architecture are characterized by a special kind of harmony, beauty, and wholeness. By the early 1990s, I had begun to focus on this particular class of processes—what I later came to call “unfoldings”—and asked why the underlying processes of nature and traditional architecture are able to create harmony and beauty without effort, while the processes of modern urban construction are almost never able to do so.

I believe these kinds of processes are common in nature—at all scales. But it is easier to identify them in architecture, because as an architect, one is more blatantly forced to ask how harmony comes about in the scale range of architecture. I believe this is why these transformations first surfaced in my studies in architecture and why they have not previously come to light or been described in physics or biology. I continue the sequence of my argument, now focusing on the logic set forth in Book 2, *The Process of Creating Life*.

14. **The structure of living things has been shown to have a predictable geometric coherence at least partly governed by the fifteen properties presented in Book 1. (demonstrated)**
15. **In examining the origin of those things in nature and in art that possess living structure, we find that this living structure comes about, almost without exception, as a result of an unfolding process that draws structure from the whole by progressive differentiation. (demonstrated)**
16. **More particularly, it is possible to define a new class of transformations—“wholeness-extending transformations”—that allow continuous elaboration of any portion of the world, according to non-disruptive and healing acts. [Note: In Book 2, the term “structure-preserving transformations” is used throughout. Since its publication, I have adopted the more expressive term “wholeness-extending.”]**
17. **This progressive differentiation and coherence building can be shown to depend on the system of wholeness-extending transformations that preserve and extend wholeness. (demonstrated)**
18. **In addition, it can be shown that these transformations generate the fifteen properties as a natural by-product of their wholeness-extending actions. (demonstrated)**
19. **It is precisely the use of these wholeness-extending transformations that has generated the greatly loved, and now treasured, traditional environments throughout the world. (demonstrated).**
20. **It can also be shown that the environments typically created by commercial development in the last 100 years are generated by an almost diametrically opposed system of wholeness-*disrupting* transformations. (demonstrated)**
21. **It may be concluded that healthy environments can only be generated by actions and processes based on wholeness-extending transformations. If we hope for health or living structure in our built environment, it is reasonable to say that the efforts of project initiation, design, planning, and construction must be revised to incorporate the necessary processes.**
22. **Not surprisingly, the new methods and processes required to achieve this healing will need to be substantially different from present-day commercial methods, thus requiring great courage and a widespread willingness to make serious changes in society. (demonstrated)**
23. **Examples throughout Book 2 demonstrate how a great variety of sequential-holistic processes can give rise to effective unfolding and produce new buildings and environments that have greater than normal coherence, adaptation, and harmony with their surroundings.**
24. **It is shown, above all, that it is the holistic and sequential nature of the unfolding that governs the coherent quality of end-product configurations. As far as we are aware, only this kind of process places appropriate emphasis on the well-being of the whole.**

I continue the argument as presented in Book 3, *A Vision of a Living World*.

25. The core quality of an environment that is unfolded through wholeness-extending transformations is its deep relatedness to human beings in a way that may be called “belonging.” (demonstrated)
26. This belonging must be something related to people’s everyday inner feelings. This relatedness is not trivial but leads, rather, to a far deeper substance than the artificial constructions currently hailed as “art.” (demonstrated)
27. In addition, structures created by a process of unfolding are likely to have a wider range of physical and human characteristics—far wider than the range of those visible in the homogeneous commercial projects of our time. They will, by their nature and by the nature of wholeness-extending transformations, nourish the land and people and give rise to a great depth and substance that provides genuine support for human beings and the Earth. (demonstrated)
28. Made in this way, the environment will be *sustainable as a whole*, and in a deeper and more comprehensive way than the partial technological sustainability that has become fashionable in recent years.
29. Book 3 provides many examples of buildings and building complexes where wholeness-extending transformations have been at work in different environmental and human settings. From these examples, one sees how much richer and more various both the processes and the resulting products are. (widely demonstrated)
30. Furthermore, in all these examples, there is a richer variety and greater number of living centers, at all scales, ranging from the very large to the very small. When one examines these examples, the characteristic change of overall quality that these techniques induce is plain to see. (demonstrated)
31. It is anticipated that such environments will, by their nature, give honor and respect to all people on earth. (Partially verified, but certainly not yet truly demonstrated, since many more examples from different cultures still need to be built and tested.)
32. As far as the extant examples are concerned, they seem to come closer to a new form of collective art that evokes the true nature of people able to express and live their own aspirations, culture by culture. All these examples encourage people to increase their own self-esteem and that of others.
33. By honoring the wholeness of the Earth and its neighborhoods, these newly built places, in their physical character and presence, are also likely to encourage and support new depths of spiritual seriousness in the people who make them and for whom they are made.
34. Such environments have not previously been an object of scientific study. The in-depth analysis and description of such profoundly made environments advances our understanding of the basic qualities and characteristics of the environment and offers an approach to healing.
35. Most important is that the many experiments described in Book 3 use the generating processes put forward in Books 1 and 2, and one can *see the results*. Briefly put, the places are experienced by people who live in them, work in them, or visit them, as something that establishes a deeper connection. In some fashion, which appears inescapable, the theory of Books 1 and 2, is confirmed by the physical results in building and by the way these places work—far more deeply, so it is argued, by people who have been in them—than the normal buildings and plans made by other contemporary methods. (demonstrated)
36. It is to be hoped that the empirical base will not only provide a sturdy underpinning for a new way of regarding the world we live in but will also provide a foundation for social and political methods of achieving these results on a wider scale. This empirical base also validates an interpretation that describes the interaction of people and their environment in a much deeper fashion than we have been used to in contemporary dialogue. Something has shifted.

Book 4: “The Luminous Ground”

In the fourth chain of my argument, I come back to the process of *doing* any work of unfolding and the core activity that needs to be followed for the unfolding to arise successfully. This depends on a cognitive state that will allow a human being—any artist, maker, architect, or planner—indeed, anyone—to perform an unfolding successfully. This requires that he or she pay attention to the *whole* (not always easy)—a skill that must be learned, since it requires that the person forget himself or herself sufficiently to be able to act as nature does.

Let us now take a deeper look at the nature of these centers from which wholeness is composed. In Book 1, I defined a center as a field-like centrality that occurs in space. It is not an object. It is not a point. It is a holistic phenomenon that appears within a larger whole. Wholeness is composed of centers. So we have a recursive phenomenon here:

centers appear in wholeness; wholeness is composed of centers. Each center has some degree of life. The life that a center has is a function of the configuration of centers that surround it and of the degree of life that these surrounding centers have. In slightly different language, a living center is a center that is unusually dense in other living centers.

Conceptually, it is not easy to hold on to this enormous multiplicity of interconnected living centers, each working on others and doing so through the action provided by the fifteen properties. Toward the end of my efforts to understand this phenomenon, I came to a formulation that expressed this in a helpful way. Namely, I chose to use the word “beings” to describe living centers. This language was slightly shocking, since it smacked of sensationalism, even of exaggeration. I found it extremely helpful, however, to think of and to see living centers—the focal points of a living structure—as “beings.”

What the word does that is especially useful is to avoid the often antiseptic language of mathematics and admit, into the phenomenon of living structure, a sense that life in some form—biological, artistic, poetic, mythical—is a *real* thing, a thing that has spirit. When one conceives a living structure as made of a multitude of beings, it allows one to give dignity to the fact that it really is *life* that is being created and that has established its presence there, not only an antiseptic shell. In the first part of Book 4, I describe this apparent life as it appears in technically “dead” stones, in marks of paint, in the roof of a certain building, in a window, or a windowpane. This way in which an inanimate configuration springs to life and calls forth life is what brings us face to face with the significance—and meaning—of the phenomenon!

I do not want to go *too* far with the concept of beings and have introduced the term only because it conveys a better sense of the enormous nature of what is going on when centers form in space. Nevertheless, the concept does underline what has already been established in early sections of this argument—namely, that one must conclude that space itself is somehow being-like, has the potential for beings to appear in it, not in the mechanistic sense of assembly from components, but in the far more startling sense that something within space and matter can be awoken by the presence of the proper configurations. It is this that begins, firmly, to close the argument and point toward a much deeper nature of matter and space than to what we are accustomed.

Completing my summary of the argument, the following steps are laid out and explored in Book 4, *The Luminous Ground*.

- 37. The empirical arguments presented in Books 1, 2, and 3, are fairly straightforward. They provide a concrete, substantial way of understanding the quality of artifacts, works of nature, and works of building. But what has not been visible so far is that the web of these empirical findings leads to an altogether deeper and somewhat mysterious picture. This picture must be understood so that one can fully grasp the significance of the earlier empirical discoveries.**
- 38. Let us come back, then, in this fourth book, to the whole: the nature of the living whole and the way that any one part of that whole plays its role within the larger whole, binding everything together. To some degree we have a picture of the way this happens, also of the processes that make it happen. But what is the meaning of these processes? What is their significance in the larger scheme of things?**
- 39. We have seen that living structure occurs when centers unfold from the whole and form complex binding schemes in which larger centers emerge from the whole, intensify the life of whole, and are built from smaller centers. (demonstrated)**
- 40. We have also seen, repeatedly, that any example of living structure creates a connection between that structure and the human self and is in some definite sense “personal.” (demonstrated)**
- 41. These observations gain empirical support from the experiments in Book 1, which indicate that perception of a self-like quality in a thing (whether it be natural or humanmade) provides the most direct access to the degree of life in the thing. (demonstrated)**
- 42. The observations also gain strong empirical support from the experiments described in Book 3, where attention to the living structure in an environment strongly increases the feeling of belonging that people experience there. (demonstrated)**
- 43. These two conclusions suggest that what I call “living structure”—whether it occurs in nature or in art—is entangled with the human self, in some fashion that we have not previously understood.**
- 44. More specifically, every single living center that appears repeatedly in living structure, at many overlapping scales, has a character connected to the human self.**
- 45. Even more exactly, any environment that has life or, for that matter, any system or work of art that has life incorporates multiple and sometimes very large numbers of living centers that appear to be being-like—i.e., self-like. This appears to be a fact of nature—not merely a psychological or cognitive interpretation.**
- 46. Experiments, observations, and descriptions of these phenomena finally bring us to the brink of something one can hardly avoid saying—namely, that the natural phenomena and artifacts made in**

this way and the living structure they exhibit strongly suggest the need for a modified understanding of the nature of matter.

47. It appears that the process of making a living environment succeeds or not to the degree that the making process is based on the repeated use of the criterion, “How much is this part, that part, or that whole like my true, inner self?” We thus find a substantial, empirically-based clue for making ecologically wholesome places, spiritually sustaining places, and energetically self-supporting places.
48. By empirical standards, this is a startling proposal. All these forms of making are dependent on perceptions and actions that might be imagined as appropriate and natural for a 14th-century Christian monk or a Sufi saint. They are far removed from the current late-20th century version of our scientific world view and what it tells us to do.
49. If the view presented turns out to be a sound and testable picture of reality, as my experiments suggest, we must then be prepared to contemplate and perhaps in the end *accept* a modification in our present-day view of the nature of space and matter.
50. In any case, whether we succeed in this renewal or not, it does seem that there are good grounds for reviewing our picture of the nature of living structure and the matter from which we are made and which surrounds us. (demonstrated)
51. At the very least, in my experience, thoughtful people who have contemplated these issues and thought about them carefully, find—sometimes with a sigh of acceptance and relief—that, within this frame of reference, they are finally able to live in a world that makes sense. They act in a way that makes sense and without those actions being based on any current canons of morality.
52. This is a world view in which acceptance of the whole and efforts to heal the whole can be seen as the most profound and most important forms of prayer. This world view is consistent with modern science and yet calls into question some of science’s most deeply rooted assumptions.
53. It is a new kind of thought about matter, in which our understanding of the world is coupled with the idea of healing the world, and in which our relation with the world is to be understood through realizing that our own selves are in the world, part of it, and not separated from it.
54. In such a modified world view, science can perhaps be brought into alignment with human feeling and awareness.
55. An apparent link between environment, self, God, and matter has shown itself. It has been uncovered by carefully raking through the ashes of our mechanical civilization and in the attempt to build a phoenix of living structure that may arise again, if we choose to pay sufficient attention to it.
56. In any case, the world can become beautiful as a result of efforts based on this new understanding. (demonstrated)
57. As a result of these investigations, it may turn out best if we redefine the concept of God in a way that is more directly linked to the concept of “the whole.” This would permit the reconciliation of our daily efforts with the wellbeing of the whole—something that is anyway necessary from a scientific point of view. But in so doing, we may be able to unite the mental and emotional territory of what was traditionally called God in a way that provides the connectedness that people crave and in a way that allows people to feel humility and responsibility for the whole as part of the sum total of mentality that once existed in other cultures and that must exist in our own highly modern civilization in a way that is true to the facts.
58. We would then have the goal of making a world that is literally made, as far as possible, from “self.” This means, of course, the eternal self that lies in each of us and manifests in living structure. This also means that the world is to be made of *this* substance.
59. But, even more shocking and exciting, there may lie ahead new ways of understanding physics and biology in these terms so that space and matter would be linked and entangled, literally, with the source of all consciousness, by reference to the whole and its hitherto misunderstood properties.

The empirical findings—those that I have marked above as “demonstrated”—are expressed in the four books with sufficient background so that it is clear they are testable and *have* been tested. It is also clear that more rigorous experiments along the same lines can be done, with larger samples, to reach conventional standards of scientific acceptance. I have not pursued this traditional scientific avenue to its full conclusion, since the construction of the *logic* of this chain of reasoning was a harder and more important task, arduous in the extreme. I spent most of these last thirty years working to make the chain of argument as clearly and as logically as I could. My experiments brought results that have established a *prima facie* case that the findings are reasonable and plausible. They now simply need confirmation through experiments conducted along more exact lines.

I look to my colleagues and to a new generation of scientists to carry this work forward with the necessary rigor.

Fertile Failures

Jenny Quillien

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*Turn sideways into the light as they say
the old ones did and disappear
into the originality of it all.
Be impatient with easy explanations
and teach that part of the mind
that wants to know everything
not to begin questions it cannot answer.*

—David Whyte, lines from *Tobar Phadraic*

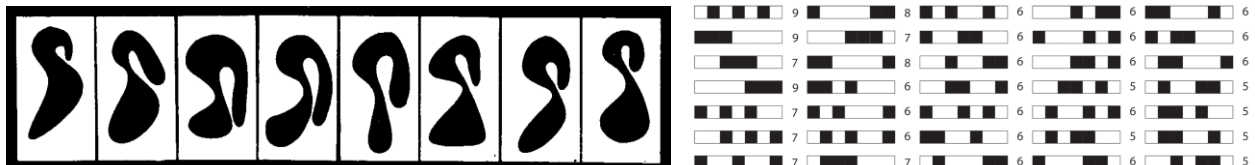
Christopher Alexander passed away in March 2022, disappearing, *as they say the old ones did ... into the originality of it all*. Perhaps that wording—the *originality of it all*—is appropriate for what Alexander so doggedly pursued during his long career: the ineffable mystery and beauty of life, always out of reach but tantalizingly near, like the disappearing smell of spring from a recent rain. In his chase, Alexander was *impatient with easy explanations*, his mind never learning to *not begin questions it cannot answer*. The coupling of his insistent quest with the unanswerability of his questions led him, again and again, into thick thorn patches of false starts, flops, and flubs.

As a celebration of Christopher Alexander’s prodigious contribution, and in memory of my time working with him, I would like to respectfully call attention to his willingness to risk and fail and then see the promise of fecundity hidden within his failure. I have chosen two misfires for illustration.

The limitations of mind

Alexander’s earliest (1960s) efforts consist of a few experiments (mostly forgotten and forgettable), *Community and Privacy*, the HIDECS notes, and his doctoral research [1]. My hunch is that these attempts reflect his desire to reconcile his childhood bent for aesthetics with his schooling in mathematics and forays into computing. As a child, Christopher had spent many hours sketching the Sussex downs where he lived and had fancied a career in the arts. His father, a tough bird, insisted on something more manly—so, Christopher did the math.

We also know, because he was quite vocal about it, that Alexander found modern architecture deeply unaesthetic and his architectural education sorely misguided. In addition, we know that he reported walking around stunned by Gödel’s paper on mathematical proofs—some things could be true but not provable [2]. As part of his early efforts to explore the power of programming in design tasks, he had tried to codify aesthetic perceptions. For example, he had people compare drawings, such as those in the figure below, left, for preferences and dimensions (ways of looking). He also recorded people’s perception of symmetries and coherence with the sorts of tiles shown in the figure below, right. In *Community and Privacy*, Alexander tried a simple program to lay out design constraints in courtyard housing. As part of his Ph.D. research (published as *Notes on the Synthesis of Form*), he wrote computer programs to sort out construction traditions in a village in India.



As readers of these early results, we don't learn much about visual aesthetics. What do we learn about the usefulness of computer applications in design? As for myself—confession here—not being a programmer or mathematically savvy, I had blithely skimmed over the details and gone straight for the conclusions. We are entitled, as readers, to some basic expectations of reliability. Scientific methods (which Alexander claimed), mathematics, and programming should lead to replicable results.

Alas, Alexander's material does not survive scrutiny. The credit for serious reading, evaluation, and detective digging goes to Richard Gabriel, who thought he caught a whiff of un-rigor and decided to check it out. Richard's following essay provides the full story [pp. 26–34]. Basically, there is no way to obtain Alexander's results with the methods described, the programs used, and the computers of that day—unless luck and the god of random number generators smiled down on his computer. For simple problems—not the Indian Village problem described in *Notes*—the programs can come close, but real problems are out of their reach. Alexander's reporting (when read carefully) is, at best, fuzzy and, at worst, evasive. Something in these early publications got glossed over. What was going on?

When I first listened to Richard talk about his investigative efforts, I imagined the young Alexander furtively sweeping irksome results under the rug and then—one fine night—sitting bolt upright in bed declaring, “*AHA! My failure is the answer, my flop shows the way! That persistent and bothersome untidiness of data that won't line up in my diagrams like good soldiers—that is the key to the health of the village building traditions! The combination of structure and undisciplined mess is the wellspring of life and vitality!*”

Richard corrected me with, “*That's really most unlikely. More probably he experienced a very bumpy aaaa-aaah...hhhhhaaaa—a slow dawning of how his programs and mathematical approaches would not and could not produce the desired results.*” Richard gave me an understanding of Alexander's mixing and matching (but not labeling) different types of efforts to grapple with non-simple problems of cohesion (strong links) and coupling (weak links).

It is most regrettable that Alexander didn't leave us with a thorough, accessible recounting of his efforts, frustrations, and workarounds when it came to computer tooling. If we limit ourselves to just his formal publications, there seem to be the early efforts, then a silence, a hiatus, and then, a bit out of the blue, “A City Is Not a Tree.” Perhaps a subtitle of “A City Is Not a Tree” could be “My failures and lessons from graduate student days.”

In writing “A City Is Not a Tree,” Alexander is painfully clear. Design is too difficult to be programmable. The essence of human life must not be reduced to the cold abstractions of computers. We need to work with our innate limitations and the innate complexity of the task. We are wrong to force fit data into linear boxes simply because that is all we know how to do. We need other approaches—more iterative, more piecemeal, more loose fit, more permissive of after-the-fact adjustments. These lessons of utmost significance about the limitations of our minds and tools were Alexander's takeaway from his early failures. The lessons remain important. Shame on the rest of the profession where these insights have yet to be really taken on board.

From whence comes quality?

Consider now another series of efforts of the following decade (1970s) wrapped up in the trilogy: *A Pattern Language*, *The Timeless Way of Building*, and *The Oregon Experiment*. The prevailing thought of the day was: Mission Accomplished. The trilogy gave the world the keys needed for beautiful buildings within a humane built environment. But disappointingly, this turned out not to be true. Ordinary well-meaning folks, books in hand, were building funky not profound. Quality went begging. So, Alexander, once again, had to assess his failure [3]. He concluded that more information and better formulation was needed. In one interview he said:

...I began to see this happening over and over again—that even a person who is very enthusiastic about all of this work will still be perfectly capable of making buildings that have this mechanical death-like morphology, even with the intention of producing buildings that are alive So there is the slightly strange paradox that, after all those years of work, the first three books are essentially complete and, from a theoretical point of view, do quite a good job of identifying the difference but actually do not accomplish anything. The conceptual structures that are presented are just not deep enough to actually break down the barrier. They actually do not do anything [4].

At this point in time, we have a fork in the road that has not yet been sufficiently scrutinized. Alexander takes off solo in one direction to address the Quality shortfall through study and communication, while his co-authors, students, and fans take off in the opposite direction of putting rubber to the road. Perhaps Alexander made a tactical error and should have joined his colleagues on the more traveled path of practice and implementation. The three trilogy books, which are pretty stories, evocative for sure, could never provide sufficient scaffolding for the do-it-yourselfer wanting to build a summer cottage with the Quality of *QWAN*.

The trilogy, to be effective, had to be in the hands of skilled professionals capable of combining the new material with existing competences in the crafts of construction: those professionals who had spatial acuity (for example, student Gary Black who grew up in a family of builders); or those who had a nose for creating ideal working conditions (for example, co-authors Murray Silverstein and Max Jacobson who built homes for clients educated, wealthy, and caring enough to support experimentation); or those who had acquired the street smarts necessary to form alliances with grant writers and financing institutions (for example, Andres Duany); or those who had mastered the social skills to combine construction with user-based project languages (for example, Tom Kubala).

These are the people who could (and did) take the trilogy and move forward because they had accepted, à la Zen archer, the necessary years of mindful practice. This is where the gold is. Quality, subtle and complex, is an embodiment of deep integration. Somehow, as a community, we now need to find way to “crowdsource” the accrued but disparate knowledge and wisdom of this first generation of skilled Alexander implementors. On his long separate solo journey, Alexander was never dismissive of hands-on experience as a teacher, but he stayed mostly in a head space and wandered far into the conceptual woods of process and structure. Those readers with the fortitude to wade through all four volumes of *The Nature of Order* know that gold nuggets abound, but will it advance their on-the-ground-skills for building that sweet summer cottage? If we read the three trilogy books and fall short, will reading *The Nature of Order* shore us up? A likely failure.

However, taking a step back, we can legitimately question just what kind of communication effort *The Nature of Order* turned out to be and how we should see its purpose. Is *The Nature of Order* a scientific treatise? Alexander certainly makes scientific-sounding propositions about, say, the fifteen properties as the real structural essence of the world as it objectively is “out there.” Personally, I see those propositions as a thorn patch in the making.

Most clearly, *The Nature of Order* is a cosmological treatise. Cosmology lends itself less to proposition and more to disposition. We tend to find that which we are disposed to find. Our dispositions allow us comprehension through *presence*, a more phenomenological “entering into” a wholeness or an in-betweenness, or a sentient “I”; this is in contrast to our propositional efforts that are more procedural—linear, logical. We—in the West anyway—are in sore need of a revitalized cosmology, a new Big Story with values, metaphorically rich enough and relevant enough to pull us together, provide meaning and direction.

Does a God Almighty ordain us to build as Alexander would have it, or do we need, as civic-minded citizens, to conscientiously place our building habits within a cultural debate of how to live decent human lives? Either way, can we possibly move toward a more beautiful built environment without a revitalized cosmology? Arguably not. In addition to the necessary integration of skills that the first generation of implementers worked on, Quality requires coherence. The wellspring of coherence, from whence it will come, will be cosmology—which Alexander worked on and has now left for us to continue.

I think it fair to conclude that when we study the works of a significant thinker, we must read the words carefully. At some point, however, we must also study the human being who penned them. From the years I spent working with Christopher Alexander (in the 1990s as a first reader of early drafts of *The Nature of Order*), I would, personally, assign more significance to his disposition than to his propositions. His disposition was to chase the mystery, to value the ineffable beauty of life, *the originality of it all*. That is what made him tick. With his relentless investigation came a remarkably calm acceptance of failure. He knew that a dead-end is also, and always, a teacher already pointing toward the next beckoning door.

Notes

1. This early “packet” comprises: “A Result in Visual Aesthetics,” *British Journal of Psychology*. 1960. 51 (4): 357–371; *Community and Privacy*, co-authored with Serge Chermayeff (NY: Doubleday, 1963); HIDECS 2 and

- HIDECS 3, <https://www.gregbryant.com/gatemaker/HIDECS2.pdf>; <https://www.gregbryant.com/gatemaker/hidecs3.pdf>; *Notes on the Synthesis of Form* (Cambridge, MA: Harvard Univ. Press, 1964). For a summary of the experiments on symmetry, see Richard Gabriel and Jenny Quillien, “A Search for Beauty/A Struggle with Complexity: Christopher Alexander,” *Urban Science* [special issue, “New Applications and Development of Christopher Alexander’s *The Nature of Order*], 3 (1): 30; <https://doi.org/10.3390/urbansci3010030>; expanded version: <https://dreamsongs.com/Files/urbansci-526122-nice-appendix.pdf>.
2. Gödel’s incompleteness theorem, *Encyclopedia of Mathematics* (Berlin: EMS Press, 2001).
 3. Interview with Alexander; available at www.sustasis.org.
 4. Stephen Grabow, *Christopher Alexander: The Search for a New Paradigm in Architecture* (London: Oriol Press, 1983), p. 128.

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Notes For “Notes On “Notes””

Richard P. Gabriel

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*Outside the window,
next door,
a shovel scrapes along the surface
of concrete and I’m guessing
something sloppy is happening.*

—Richard P. Gabriel, lines from *Clinical Locution*

[This short note is a prolegomenon to a longer, more thorough essay on my experiences trying to reproduce Christopher Alexander’s Indian Village design results as presented in *Notes on the Synthesis of Form* (Harvard Univ. Press, 1964) and “The Determination of Components for an Indian Village”—rpg]

I first heard of Christopher Alexander around 1990. I started with *The Timeless Way of Building*, dipped into *A Pattern Language*, absorbed *The Oregon Experiment*, moved to *A Foreshadowing of 21st Century Art: The Color and Geometry of Very Early Turkish Carpets*. In 1996, I received pre-publication photocopies of the four volumes of *The Nature of Order*.

In the early 1990s, Alexander started to become popular with software developers, and I wrote a series of essays about his work for my column in *The Journal of Object-Oriented Programming*. These essays turned into a book, and Christopher Alexander wrote its Foreword. Later, I supervised his work on the Gatemaker program [1].

Notes on the Synthesis of Form (henceforth *Notes*) was among the last of Alexander’s books that I read—around 2015. Unlike some computer scientists who loved his concept of misfits and his algorithmic approach to design modularity, I considered this formalism non-Alexandrian, and therefore a distraction. But so many people talked about this book that I felt I needed to read it to be a complete Alexandrian scholar. I was intrigued by the idea hinted at that a program written around 1960 could solve as complex a problem as the Indian Village redesign/rebuild—the “Worked Example” reported in the Appendix to *Notes*.

The essential problem that Alexander laid out in *Notes* was to take a set of 141 design “requirements,” a set of some 1400 interactions among them, and partition the requirements into groups that represent coherent design subtasks, or “components.” Alexander’s approach was to create a “goodness” measure that would numerically determine how good a partition was. Then the idea was to *generate* disjoint partitions and *test* them using this measure. Computer scientists call this algorithmic search technique *generate and test*.

The *Notes*’ Appendix included a pretty decomposition of the problem. When I tried to reproduce Alexander’s results, however, I was immediately confused by the many clerical-like errors in the raw data supplied in the Appendix and the odd mathematical approach he took to creating his goodness measure. The clerical errors and sketchy definitions of terms made interpreting the apparently straightforward goodness measure difficult [2]. Moreover, *Notes* did not contain a direct statement that the program hinted at actually produced the presented decomposition.

The references in *Notes* mention two research reports that seemed to promise explanations: I call them “HIDECS 2” [3] and “HIDECS 3” [4]. I was unable to obtain these reports until long after the start of my investigation. The problem to be solved is essentially the problem of *cohesion and coupling*, a pair of technical characteristics of programs in modern software modularity: One must gather together programming “concerns” that strongly belong together (*cohesion*) while isolating less strongly binding concerns (*coupling*). One way to think about these two concerns is that the members of a family typically do many things together (*cohesion*), while members of different families do

fewer things together (*coupling*). These modern concepts of cohesion and coupling were probably not available to Alexander in 1959 in this exact form—that is, with these names.

In addition to trying to decipher Alexander’s approach, I tried several now-classical algorithms: K-Means clustering, Silhouette clustering, Karger’s algorithm, and several of my own devising. For generate-and-test, I used dynamic programming, greedy algorithms, simulated annealing, genetic programming, and some simple hill-climbing techniques. None worked well enough to come close to reproducing the decomposition in *Notes*.



After many failed tries at reproducing Alexander’s results, I finally obtained the two HIDECS reports as well as a version of the HIDECS 2 program transliterated into Python programming language [5]. At the same time, I obtained a paper entitled “The Determination of Components for an Indian Village,” in which Alexander shows a slightly different goodness measure from the one in *Notes* and states directly that “minimization according to this function has been programmed for the IBM 7090. It is this function that gave the decomposition of the village problem that follows” [6]. The decomposition that followed was exactly the one in *Notes*.

Of the 50 errors in Alexander’s interactions table, 30 involve requirement 33: “Fertile land to be used to best advantage.” The errors are that some requirements list asymmetric interactions. That is, whenever we see a statement like “33 interacts with 56,” we (and Alexander’s algorithm) expect to see “56 interacts with 33.” The key to Alexander’s mathematical analysis of complex decomposition problems and the goodness measure he creates is counting the number of links between sets of requirements. Before I had the source code for his program, these errors made it hard to understand his analysis and therefore his goodness measure [7].

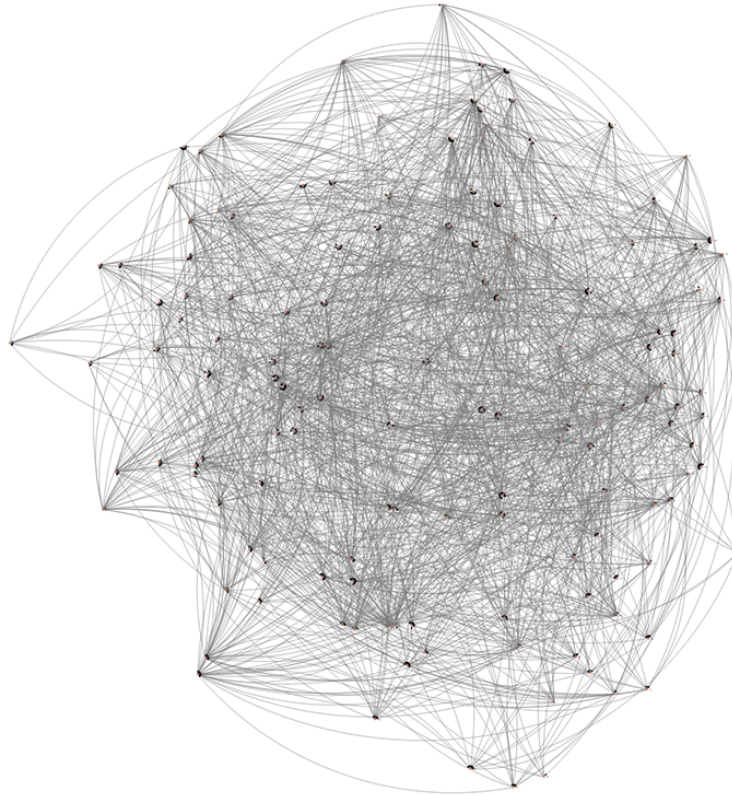
The two HIDECS reports describe five different programs, each using a different approach to partitioning a design problem. After receiving the new material, I coded my own program versions, but none produced exactly the decomposition in *Notes*. That, however, was not the interesting conclusion. The program called HIDECS 2 was designed to separate components into clusters with minimal information transfer between them, meaning that the number of interaction links across cluster boundaries is small. Alexander was trying to solve the coupling part of the cohesion/coupling problem. Using the family analogy, he was trying to identify families in a population by finding clusters of people where each cluster doesn’t do much with the other clusters.

In the HIDECS reports, Alexander calls the design requirements “vertices” or “misfit variables” and the interactions between them “links.” HIDECS 2 proceeds by splitting the set of all the vertices into two disjoint subsets (*partitions*) using a random-selection process that produces two subsets of, typically, unequal size. Next the program systematically tries moving single vertices from one subset to the other, one at a time, measuring the goodness of partition at each step, and selecting the best [8]. This procedure yields a binary partition of the set of vertices into disjoint subsets; the program moves ahead by doing the same process on the two partitions separately. The result is a binary tree: Each node in the tree has exactly two subtrees below it. Computer scientists describe this strategy as a “top-down algorithm.” Note also that the goodness measure needs to measure the goodness of a partition of only two sets.

In my early investigations, I had discovered that trying to find clusters by looking for weak coupling did not work well when the interactions were dense, such as in the Indian Village problem. I also tried looking at cohesion as well as cohesion/coupling combined. In the main body of *Notes*, Alexander shows what he calls “a typical graph” as part of his description of how to decompose design problems using a program. Here is that typical graph:



Every program I wrote and every program in the HIDECS reports can decompose this typical graph. By way of contrast, here is a visualization of the network of interactions for the Indian Village problem:



Once one starts to look for strongly cohesive clusters instead of loosely coupled ones in a dense network of interactions, overlap naturally occurs. I know that Alexander noticed this too: First, because playing with Alexander's earliest program and seeing it not do a good job or not doing a consistent job would lead anyone with curiosity to try alternatives. Second, because he said so:

HIDECS 2 has three important weaknesses:

- 1. The fact that the decomposition is made in a series of binary steps leads to certain "mistakes," since the holistic relatedness of system and subsystems is not properly taken into account.*
- 2. The fact that the decomposition criterion INFO [the goodness measure] is based on very stringent assumptions about the nature of the system $G(M,L)$. Namely, that the elements of M are binary variables, that the two variable correlations are very small, and that the many variable correlations vanish altogether. These assumptions make it hard to find systems in the real world which the formalism of HIDECS 2 can adequately represent.*
- 3. The fact that the subsets of elements which make the most natural subsystems of a system are not always disjoint, but often overlap [4].*



In the HIDECS 3 report, Alexander addresses these flaws. He describes four programs. The first flaw is that by going top down, HIDECS 2 never looks at the total, fine-grained partition presented by the leaves of the binary tree. The approach in the first HIDECS 3 program is to start with a partition of the vertices into sets of single elements—for the Indian Village problem, this is 141 sets. The program systematically tries combining pairs of partitions, measuring the goodness of the entire partition; to do this, Alexander extended the HIDECS 2 measure. This produces a decomposition into disjoint sets, not a tree.

Alexander then observes a flaw with this program: A vertex with many links to a single other vertex in the same potential partition might be pulled into a different partition because it also has many single links to the vertices there. Returning to the family analogy, someone with many friends in another family might be considered a member of that family and not of their real family. The second program proceeds by starting with a partition into single-vertex sets and then systematically tries moving one vertex at a time from the set it happens to be in to each of the other sets, one at a time. Alexander also created a new goodness measure that looks only at cohesion—that is, to how strongly each vertex is linked to other vertices in the same potential partition. The algorithms using the earlier goodness measures try to minimize those measures—that is, minimize coupling; this algorithm tries to maximize the goodness measure—that is, maximize cohesion. Keep in mind Alexander likely did not have available the named concepts of cohesion and coupling.

Once the first move was made for working with cohesion, Alexander moved more strongly in that direction. In 1957, researchers Frank Harary and Ian Ross developed an improvement to one of the first *clique-detection* algorithms [9]. Alexander adopted this algorithm (by direct reference to their paper) for the third and fourth programs in the series of four in the HIDECS 3 collection. The essential idea is that a partition is very strong when each vertex interacts with every other one—this is the definition of a clique. For example, if there are three vertices, each interacts with the other two; if there are four, each interacts with the other three. The third and fourth of the programs in HIDECS 3 are variations on this. In the typical graph illustrated earlier, one can see three strongly interacting triangles of vertices; these are cliques.

Alexander noticed such tight cohesions in the HIDECS 2 paper and program. While partitioning a set into subsets, when the program notices such *complete graphs*, it does not try to subdivide them. The Harary and Ross algorithm has flaws, as reported by Harary in his 1969 text, *Graph Theory*. Instead of using that algorithm, I used a more modern one—the Tomita variant of the Bron-Kerbosch algorithm. In 1967, Edward Bierstone and Allen Bernholtz developed a semi-lattice recomposition program described in their report “HIDECS-RECOMP PROCEDURE” [10]. I implemented that algorithm as well, which can be used to visualize the various decompositions that start from clique detection.



Once I had all the bits of source code I needed to understand what the HIDECS programs were doing, my interest in improving the results faded, as I suspect they did for Alexander. It became clear that the original program, HIDECS 2, being a randomized algorithm, could spit out a different partition each time it ran, but that there was a limit to how well these partitions would measure out according to the goodness measure. Moreover, as far as I know, Alexander never reported a complete partitioning of the Indian Village problem, and what he did report did not conform to what the program would produce. Namely, Alexander presented a decomposition of the full problem into four sets, each likely the union of two that were produced. This makes it difficult to judge how well his original program compares to my modern version, which I wanted to do for the sorts of problems he described.

The basis for comparison was to use my recoding of his program running on modern hardware to try to reproduce results he recorded. Alexander wrote in the HIDECS 2 report:

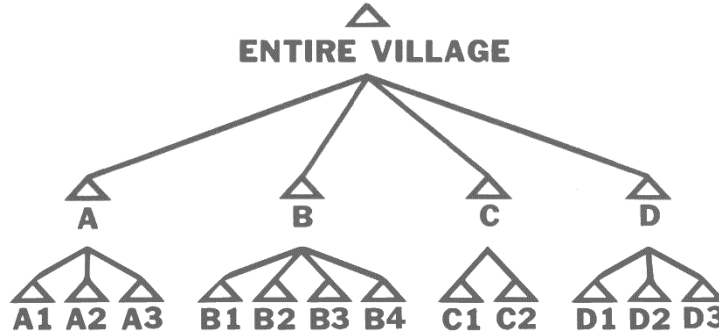
...the program requires as input...LATIS, the number of starting sets for the hill-climbing algorithm to be chosen from the lattice.... The larger the value of LATIS selected, the more likely that the sampling procedure will discover the optimal TSET—but as the sample size increases, so does the amount of computer time used [3].

My program running on my computer can support values for LATIS 50–500 times larger than his could for a given expected duration of computation. For the goodness measure, I decided to use the one he described in “Determination of Components,” which is not quite the same as the one in the HIDECS 2 report, but it preserves ordering—if G_D is the measure in “Determination of Components” and G_H is the measure in HIDECS 2, then

$$G_D(\pi_1) < G_D(\pi_2) \text{ if and only if } G_H(\pi_1) < G_H(\pi_2)$$

where π_1 and π_2 are two partitions. G_D is the measure that produced the decomposition of the Indian Village problem as reported in both “Determination of Components” and *Notes*.

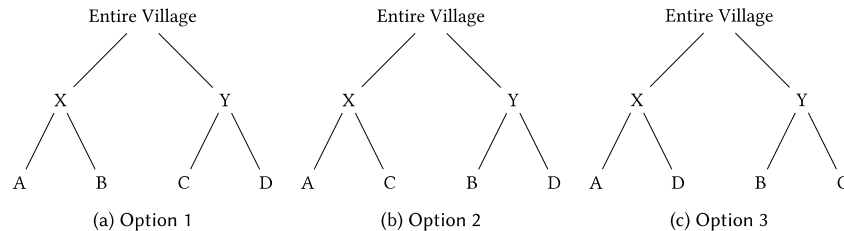
In general, the results for the Indian Village were that his program found partitions with worse goodness measures than mine. The only directly stated example of a partition into exactly two sets is the partition of C into C1 and C2:



The goodness measures for Alexander’s partition and the one my program produced using 250 times more starting sets is as follows, where smaller is better (−91 is better than −89):

	C
CA	−89.60
rpg	−91.60

I discovered one extraordinary anomaly while looking at the top two levels of decomposition in *Notes*. I wanted to see the relative success of Alexander’s program for partitioning the Entire Village—the hardest partition of all. Alexander presents a partition of the whole problem into four sets, A, B, C, D. As noted, his program actually produces a binary partition of the whole problem (X,Y), and then each of those was further partitioned into two, yielding four. But, of the four shown, which two came from the same initial partition? That is, the Indian Village must have been partitioned in two sets, X and Y; does $X=A+B$, $X=A+C$, or $X=A+D$? [11]. Here are the possibilities:



We know what vertices are in A because we know what vertices are in A1, A2, and A3: they are listed on page 151 of *Notes*:

Group	Elements
A1	7, 53, 57, 59, 60, 72, 125, 126, 128
A2	31, 34, 36, 52, 54, 80, 94, 106, 136
A3	37, 38, 50, 55, 77, 91, 103

Similarly for B, C, and D. Therefore, we know what vertices would be, for example, in X if $X=A+B$ and in Y if $Y=C+D$. To find out which two came from the same initial partition, I tried all possible pairings—that is, I tried Options 1, 2, and 3. The pairing that produced the best goodness for X and Y using the goodness measure is Option 1. For concreteness, here are the raw values (smaller numbers are better, so −645 is better than −562):

Option	Goodness
Option 1	-645.04
Option 2	-434.40
Option 3	-562.65

I guessed Option 1 was what Alexander’s program did. Then I tried running my version of HIDECS 2 on the Entire Village; its result at the first level, X_1 and Y_1 , measured out to -655.12 —clearly better than all the options derived from Alexander’s partition into four sets. I expected that if my program took that X_1 , it would produce A_1 and B_1 that would measure out better than Alexander’s A and B; and taking that Y_1 , it would produce C_1 and D_1 that would also measure out better. This was a naïve idea: the resulting partitions from my program were not much like Alexander’s; it proved problematic to come up with an apples/apples comparison [12].

While trying to figure out how to proceed, I ran an exhaustive pairwise computation of the goodness measure on Alexander’s A, B, C, and D:

Pairs	Goodness
A & B:	-197.83
A & C:	-257.00
A & D:	-197.98
B & C:	-341.70
B & D:	-345.84
C & D:	-297.75

From this table, I guessed that Alexander’s program partitioned the Entire Village into $X=A+C$ and $Y=B+D$. This is the worst of the three options. When I used those for starting points and derived my versions of A_2 , B_2 , C_2 , and D_2 , they were exactly the same as Alexander’s. Stated bluntly: the overall best partition (for A, B, C, D) is not necessarily obtained by doing the best job starting at the top and working down to get the best X and Y, followed by getting the best A and B from X and the best C and D from Y. This is possibly what Alexander meant in the first of his three observed weaknesses of HIDECS 2 as discussed in the HIDECS 3 report: “The holistic relatedness of system and subsystems is not properly taken into account.” Alexander’s other HIDECS programs produced single levels of partition; some produced partitions with overlaps. In general, the results shed confusing light on the Indian Village problem, and I believe this was how it seemed to Alexander.



During my investigations, I was struck by the cold abstractness of the problem statement: 141 vertices and some 1400 links binding them together. However, these requirements came from real people and state real issues. Alexander writes:

All these misfit variables are stated here in their positive form; that is, as needs or requirements which must be satisfied positively in a properly functioning village. They are, however, all derived from statements about potential misfits: each one represents some aspect of the village which could go wrong and is therefore a misfit variable [Notes].

Moreover, the vertices are broken into 13 groups: *Religion and Caste; Social Forces; Agriculture; Animal Husbandry; Employment; Water; Material Welfare; Transportation; Forests and Soils; Education; Health; Implementation; Regional, Political, and National Development*. Here is a selection from each group:

- 7. Cattle treated as sacred, and vegetarian attitude.
- 23. Men’s groups chatting, smoking, even late at night.
- 36. Protection of crops from thieves, cattle, goats, monkeys, etc.
- 53. Upgrading of cattle.
- 65. Diversification of villages’ economic base—not all occupations agricultural.
- 67. Drinking water to be good, sweet.
- 79. Provision of cool breeze.

- 98. Daily produce requires cheap and constant (monsoon) access to market.
- 106. Young trees need protection from goats, etc.
- 112. Access to a secondary school.
- 125. Prevent malnutrition.
- 129. Factions refuse to cooperate or agree.
- 133. Social integration with neighboring villages.

In *Notes*, Alexander writes:

Above all, the designer must resist the temptation to summarize the contents of the tree in terms of well-known verbal concepts. He must not expect to be able to see for every S some verbal paradigm like “This one deals with the acoustic aspects of the form.” If he tries to do that, he denies the whole purpose of the analysis, by allowing verbal preconceptions to interfere with the pattern which the program shows him. The effect of the design program is that each set of requirements draws his attention to just one major physical and functional issue, rather than to some verbal or preconceived issue. It thereby forces him to consolidate the physical ideas present in his mind as seedlings, and to make physical order out of them.

While trying to reproduce the decomposition in *Notes*, I entertained the hypothesis that Alexander made it by hand, and that he looked at the realities expressed in the requirement statements. Some of my speculative, pre-HIDECS-informed programs took into account the 13 groups or various other groupings of them based on what they meant. And in fact, when Alexander describes his decomposition, he spins a story of how they are connected. Here is the start of one such:

The sacredness of cattle (7) tends to make people unwilling to control them, so they wander everywhere eating and destroying crops, unless they are carefully controlled. Similarly, the need to upgrade cattle (53) calls for a control which keeps cows out of contact with roaming scrub bulls; and further calls for some sort of center where a pedigree bull might be kept (even if only for visits); and a center where scrub bulls can be castrated. Cattle diseases (57) are mainly transferred from foot to foot, through the dirt—this can be prevented if the cattle regularly pass through a hoof bath of disinfecting permanganate....



What can we learn from these investigations? Christopher Alexander’s journey was of slowly dawning insights, not a grand aha! He created flawed software that hinted at approaches to decomposition instead of reliably solving the problem. Although he did not have the concepts of cohesion and coupling as they are now known, he navigated the waters between them. He was not shy about using techniques and algorithms invented by others: some randomized algorithms already existed and were generally known in the late 1950s [13]; clique detection algorithms were known and Alexander acknowledges using one [see note 9]. Alexander and Manheim were not inept programmers—the HIDECS programs were written in assembly language and exhibited a sophisticated use of so-called “bumming” techniques [14].

The HIDECS reports are not part of Alexander’s formal publications; they are technical or research reports internal to a research organization and, in that sense, not very different from lab notes. It isn’t fair to criticize based on deep analysis of such ephemeral materials. It is fair, however, to note the progression of thought from these very early investigations to those near the end of Alexander’s career. Imagine the mind that progressed as follows. He wrote the following in the early 1960s:

The tree of sets this decomposition gives is, within the terms of this book, a complete structural description of the design problem defined by M; and it therefore serves as a program for the synthesis of a form which solves this problem The organization of any complex physical object is hierarchical. It is true that, if we wish, we may dismiss this observation as an hallucination caused by the way the human brain, being disposed to see in terms of articulations and hierarchies, perceives the world. On the whole, though, there are good reasons to believe in the hierarchical subdivision of the world as an objective feature of reality [Notes].

Next from “A City is not a Tree” written in 1965:

For the human mind, the tree is the easiest vehicle for complex thoughts. But the city is not, cannot and must not be a tree. The city is a receptacle for life. If the receptacle severs the overlap of the strands of life within it, because it is a tree, it will be like a bowl full of razor blades on edge, ready to cut up whatever is entrusted to it. In such a receptacle life will be cut to pieces. If we make cities which are trees, they will cut our life within to pieces [15].

Around the same time, in an essay, “On Value”:

Myself, as some of you know, originally a mathematician, I spent several years, in the early sixties, trying to define a view of design, allied with science, in which values were also let in by the back door. I too played with operations research, linear programming, all the fascinating toys, which mathematics and science have to offer us, and tried to see how these things can give us a new view of design, what to design, and how to design Finally, however, I recognized that this view is essentially not productive, and that for mathematical and scientific reasons, if you like, it was essential to find a theory in which value and fact are one, in which we recognize that here is a central value, approachable through feeling, and approachable by loss of self, which is deeply connected to facts, and forms a single indivisible world picture, within which productive results can be obtained [16].

Finally, in *The Nature of Order*, Volume 4:

The I, that blazing one, is something which I reach only to the extent that I experience, and make manifest, my feeling. What feeling, exactly? What exactly am I aiming for in a building, in a column, in a room? How do I define it for myself, so that I can feel it clearly, so that it stands as a beacon to steer me in what I do every day? ... What I aim for is, most concretely, sadness. I try to make the volume of the building so that it carries in it all feeling. To reach this feeling, I try to make the building so that it carries my eternal sadness. It comes, as nearly as I can in a building, to the point of tears [17].

We see in the early mind what the mind became. When we read the backstories in the HIDECS reports and read carefully the words in Alexander’s formal publications, we learn that the reality of the computer and the poverty of programming languages were stern teachers, teaching him that cold abstraction requires a warm human hand and experienced, tear-filled eyes, that machines can be partners for exploration, and that a city is not a tree [17].

Notes

1. <https://www.youtube.com/watch?v=o8b7ZBWGmu4>.
2. There are either 1383 interactions or 1433, depending on how you treat the errors. In the HIDECS 2 report, Alexander makes it clear he used 1383, regarding the 50 others as essentially cardpunch errors.
3. Christopher Alexander and Marvin Manheim, “HIDECS 2: A Computer Program for the Hierarchical Decomposition of a Set with an Associated Graph,” MIT Civil Engineering Systems Laboratory Publication No. 160 (Cambridge, MA, 1962).
4. Christopher Alexander, “HIDECS 3: Four Computer Programs for the Hierarchical Decomposition of Systems Which Have an Associated Linear Graph,” MIT Civil Engineering Systems Laboratory Research Report R63-27 (Cambridge, MA, 1963).
5. <https://gitlab.com/Zenbagailu/hidecs-2-python>.
6. In Christopher Jones, *Conference on Design Method*, Pergamon, 1963. <https://beautiful.software>.
7. Such errors are not uncommon in his early work. While doing a close reading of his earlier 1960 paper, “A Result in Visual Aesthetics,” I noticed a handful of similarly careless and sloppy statements and data. When something like this happens in fiction, it’s called an “unreliable narrator.” See “Christopher Alexander, “A Result in Visual Aesthetics,” *British Journal of Psychology*, 51 (4): 357–71 (November 1960). For a discussion of errors in this paper, see Richard Gabriel, “Notes on “A Result in Visual Aesthetics,” <https://dreamsongs.com/Files/Aesthetics.pdf>.
8. Being a randomized algorithm, HIDECS 2 runs these steps (random partition followed by hillclimbing) a number of times, choosing the best partition. My computer and version of this program can run these steps hundreds of times more than his could in a tolerable amount of time.

9. Frank Harary and Ian C. Ross, "A Procedure for Clique Detection Using the Group Matrix," *Sociometry*, 20 (3) (September 1957).
10. E. Bierstone and A. Bernholtz, "HIDECS-RECOMP PROCEDURE," Department of Civil Engineering, MIT, (Cambridge, MA, March 1967).
11. "A+B" means the vertices of A and B are combined into a single set (set union). And note that if $X=A+B$, then $Y=C+D$, etc.
12. My program partitioned X_1 into pairs with goodness -320.53 and Y_1 into pairs with goodness -173.39 .
13. Simulated annealing, which I used in this investigation, was invented in 1953 by *Nicholas Metropolis*.
14. Bum: "to make highly efficient, either in time or space, often at the expense of clarity."
15. Christopher Alexander, "A City is Not a Tree," *Architectural Forum*, Vol 122, No 1, April-May 1965, pp. 58–62.
16. Christopher Alexander, "On Value," *Concrete* 1965.
17. Christopher Alexander, *The Nature of Order, Vol. 4: The Luminous Ground*. Berkeley: Center for Environmental Structure, 2004.

Book Note

Eva Guttman, Gabriele Kaiser, and Claudia Mazanek, eds., 2019. *Shifting Patterns: Christopher Alexander and the Eishin Campus*. Zurich: Park Books AG.

Originally published in German in 2017, this collection of essays and interviews relates to Christopher Alexander's Eishen campus in Japan. The reader is unsure why the book was published, since the editors are ambivalent about Alexander's work. The six substantive essays included in the volume do not discuss Alexander's Eishen campus at all or mostly criticize his work unfavorably. For example, the Austrian architectural journalist Christian Kühn writes:

Why "living" architecture is not able to develop beyond this type [illustrated by the Eishen School] cannot be explained by Alexander's theory. His architecture

burdens itself with the task of having to invent a radically new architecture with the formal means of the past. The entire potential of spatial strategies built up by the architecture of modernity thus remains unused without deeper explanation (p. 150).

This criticism makes little sense, particularly because Alexander aimed to move away from present-day modernism and return to a way of designing that revitalized placemaking. Unfortunately, none of the six authors contributing formal entries to this edited collection appear to have knowledge of Alexander's aims or designs and therefore provide commentaries

offering little help for understanding Alexander's way of designing and its application for the Eishen campus.

The main value of this volume is its interviews with Alexander associate **Hajo Neis** and client **Hisae Hosoi**, Principal of the Eishen school. Here, we reprint portions of the interview that the editors conducted with Hosoi. His supportive comments demonstrate Alexander's aim to create a school campus that, via its design, would contribute to a wish in students to study, learn, and understand.

Interview with Hisae Hosoi, Principal of the Eishen School

Hosoi: I was thinking a school was very close to "a house to live in" because faculty and students lived everyday there like a house. A school is a place completely released from the labor pains of learning. "Going back home" sounds like a kind of release from labor. A school should be a comfortable place to enjoy everyday school life like a house with spaces of sweet memory ...

At the time, I accidentally picked up Alexander's *The Oregon Experiment* from a pile of books on my desk I felt that he seemed different from any other ordinary modern architects who usually told a client to leave everything in their hands ... In this book, Chris was trying to establish general rules and principles that could be applied to the relationship between a client and an architect. He proposed "user participation" He described how to proceed with the designing work with [our faculty] through continuous discussion

Chris came to Japan in April 1981. When the contract was concluded at the school, Chris made a statement to the board that he would try his best to create a small and beautiful village as a new campus. I was very happy. I knew that I had hit right on the target ... My image about a school was exactly materialized in the wording of a small and beautiful village

Before leaving Japan, Chris asked a land surveyor to make a survey map with 20 cm contours He wanted to leave the original geography of the land as much as he possibly could ... It was a pleasant surprise for me to see how strongly he focused his attention on the project. Chris wore a white shirt with no tie and cotton pants through the year. His casual fashion and frank personality worked well to relax the teachers. They were talking about various aspects of school activities and about their dreams of a new campus.

One of the interesting questions Chris asked them was, "What is the most holy place in the school? Let me have your ideas, please." They were embarrassed when faced with this unexpected question. One of the teachers came to me to ask if it was alright for him to say anything he wanted to. I said to him that it was quite okay as long as it was his true desire.

Except for Chris, there may not be many architects who proceed by interviewing one-hundred employees. Actually, Chris did it. Sometimes he talked with teachers for one hour or more. It took lots of time and energy I now summarize:

1. Chris completed individual interviews with one-hundred faculty members and students.
2. Through the interviews, Chris and his staff tried to break the hard shell of common sense covering them and reached the true desire hidden behind the hard shell.

3. Teachers gave their requests and ideas about a new campus, from minor things to what they wanted on the campus as a whole.

4. Even if a request only came from one person, it could be picked out in a very positive way as long as it gave the campus its own life.

5. It was very important to pay attention to the school's educational policy, respecting and growing the individuality of students and faculty, when implementing a place for their everyday school life like a house to live in.

In May, Chris returned to Japan with a first draft of the Project Language. Takaaki Aida, a geography teacher, said: "It is a poem, it expressed the faculty's true desire about a new campus in the form of a beautiful poem. [see Alexander et al. 2012 for the complete Eishen pattern language].

An image of a new Campus as a whole, which came from this "poem," was completely different from any kinds of subjective images that architects thought of individually. Because when the draft of the Project Language was introduced to the faculty, many teachers shared and supported the image of this poem. As a result, the draft was accepted by them in a faculty meeting

The site for the school was in Iruma City, Saitama Prefecture and its area was 6.7 hectares [16.5 acres]. The land was covered with tea bushes and had a slanted slope from west to east The site plan

was done on the site itself with many bamboo sticks with flags, used to identify the four-corner points of buildings described in the Project Language

The first task was to decide where the entrance of the Campus was. The first entrance building (small gate), the main entrance building and the entrance street connecting these two buildings were described in the Project Language. [It was decided] to place the location of the first entrance building in the east-northeast [portion of the site] so that the entrance street to the main entrance building was roughly flat. It was quite natural to reach that final decision....

We used flag sticks to define where to place [all] buildings on the site. We used blue flag sticks to define the shape of the lake. Regarding the other buildings, different colored flag sticks we used to show their four corner points. We used red-flag sticks for the Great Hall, gymnasium, multi-purpose building, and Judo Hall.

For smaller buildings ..., we used yellow-flag sticks to define the four-corner points and white to show the center lines between the buildings. It was a lot of fun for faculty members to walk around the site with Chris ... to decide the location of the buildings. Very often their location would be changed by moving flag sticks

We enjoyed the wonderful "mirage" appearing in front of us as the symbol of the work between Chris, his staff, and the faculty. A layout resulting from such a long journey was then drawn down on paper to

become part of the final site plan [see Alexander et al. 2012]

In this project, Chris tried to recover the regional culture, the natural shape of the land, the harmony with the surrounding environment, as well as the harmony among facilities on the campus, which modern architecture abandoned to get freedom for the individual images.

From the first stage of making the Project Language, Chris proceeded with the work through continuous discussion with one-hundred faculty members and students. It was a typical, traditional way of building houses through discussion between a client and a master carpenter. Such an attempt by Chris, of course, goes against the stream of modern architecture and the current way of construction by the big companies in Japan.

The actual work of Chris and the faculty on the site with the many bamboo poles with flags made us once again realize the true meaning of an ordinary way of building houses in the old days in Japan and to see what problems modern architecture has caused today.

Reference

Alexander, C., Neis, H., and Moore Alexander, M., 2012. *The Battle for the Life and Beauty of the Earth*. NY: Oxford Univ. Press.

Photographs of the Eishen Campus

On the following two pages is a series of photos of the Eishen Campus taken by Japanese photographer **Takeshi Kakeda**. We are grateful for his permission to reprint these images, which offer a vicarious visual sense of Eishen's vibrant sense of place. In an email, Kakeda wrote of his visit to the Eishen campus:

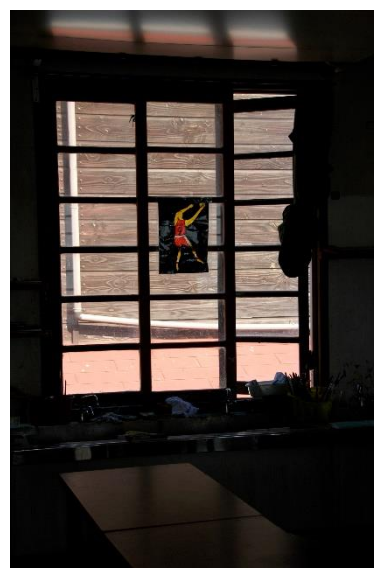
The most impressive memory was a student's father pulling a cart on campus [see last photo in sequence]. At first, I thought the man was a teacher, but I spoke to him, and he explained he was doing the chores of the school himself on his day off. I felt that not only students, but also their parents cared about the school campus. I had the strange feeling that the campus was a mixture of nostalgia and novelty—in other words, comfortable and curious. I liked it.

The campus was like a village. There were the buildings, pond, and trees. Most Japanese high school campuses have monotonous buildings, poor greenery, and flat ground. They focus on efficiency only, but the Eishin campus doesn't. I sensed that the students felt comfortable and open.

To see more Eishin photographs by Takeshi Kakeda, visit his Flickr site at: <https://www.flickr.com/photos/kakeda/albums/72157622334241919>.

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Questions relating to environmental and architectural phenomenology (from *EAP*, 2014 [vol. 25, no. 3, p. 4])

Questions relating to phenomenology and related interpretive approaches and methods:

- What is phenomenology and what does it offer to whom?
- What is the state of phenomenological research today? What are your hopes and concerns regarding phenomenology?
- Does phenomenology continue to have relevance in examining human experience in relation to world?
- Are there various conceptual and methodological modes of phenomenology and, if so, how can they be categorized and described?
- Has phenomenological research been superseded by other conceptual approaches—e.g., post-structuralism, social-constructionism, critical theory, relationalist and non-representational perspectives, the various conceptual “turns,” and so forth?
- Can phenomenology contribute to making a better world? If so, what are the most crucial phenomena and topics to be explored phenomenologically?
- Can phenomenological research offer practical results in terms of design, planning, policy, and advocacy?
- How might phenomenological insights be broadcast in non-typical academic ways—e.g., through artistic expression, theatrical presentation, digital evocation, virtual realities, and so forth?
- What are the most important aims for future phenomenological research?
- Do the various post-structural and social-constructionist criticisms of phenomenology—that it is essentialist, masculinist, authoritative, voluntarist, ignorant of power structures, and so forth—point toward its demise?

Questions relating to the natural world and environmental and ecological concerns:

- Can there be a phenomenology of nature and the natural world?
- What can phenomenology offer the intensifying environmental and ecological crises we face today?
- Can phenomenology contribute to more sustainable actions and worlds?
- Can one speak of a sustainable lifeworld?
- What is a phenomenology of a *lived* environmental ethic and who are the key contributors?
- Do the “sacred” and the “holy” have a role in caring for the natural world? For places? For lifeworlds broadly?
- Can phenomenology contribute to environmental education? If so, in what ways?

- Can there be a phenomenology of the two laws of thermodynamics, especially the second law claiming that all activities, left to their own devices, tend toward greater disorder and fewer possibilities? Are there ways whereby phenomenological understanding of lifeworld might help to reduce the accelerating disordering of natural and human worlds?

Questions relating to place, place experience, and place meaning:

- Why has the theme of place become an important phenomenological topic?
- Can a phenomenological understanding of place contribute to better place making?
- Can phenomenology contribute to a generative understanding of place and place making?
- What roles do bodily regularity and habitual inertia play in the constitution of place and place experience?
- What are the lived relationships between place, sustainability, and a responsive environmental ethic?
- How are phenomenological accounts to respond to post-structural interpretations of space and place as rhizomic and a “mesh-work of paths” (Ingold)?
- Can phenomenological accounts incorporate a “progressive sense of place” argued for by critical theorists like Doreen Massey?
- Can phenomenological explications of space and place account for human differences—gender, sexuality, less-abledness, social class, cultural background, and so forth?
- Can phenomenology contribute to the politics and ideology of place?
- Can a phenomenological understanding of lived embodiment and habitual inertia be drawn upon to facilitate robust places and to generate mutual support and awareness among places, especially places that are considerably different (e.g., different ethnic neighborhoods or regions)?
- Can phenomenology contribute to mobility, the nature of “flows,” rhizomic spaces, the places of mobility, non-spaces and their relationship to mobility and movement?

Questions relating to architecture and environmental design and policy:

- Can there be a phenomenology of architecture and architectural experience and meaning?
- Can phenomenology contribute to better architectural design?
- How do qualities of the designable world—spatiality, materiality, lived aesthetics, environmental embodiment etc.—contribute to lifeworlds?

- What are the most pertinent environmental and architectural features contributing to a lifeworld’s being one way rather than another?
- What role will cyberspace and digital technologies have in 21st-century lifeworlds? How will they play a role in shaping designed environments, particularly architecture?
- What impact will digital advances and virtual realities have on physical embodiment, architectural design, and real-world places? Will virtual reality eventually be able to simulate “real reality” entirely? If so, how does such a development transform the nature of lifeworld, natural attitude, place, and architecture?
- Can virtual worlds become so “real” that they are lived as “real” worlds?

Other potential questions:

- What is the lived relationship between people and the worlds in which they find themselves?
- Can lifeworlds be made to happen self-consciously? If so, how? Through what individual efforts? Through what group efforts?
- Can a phenomenological education in lifeworld, place, and environmental embodiment assist citizens and professionals in better understanding the workings and needs of real-world places and thereby contribute to their envisioning and making?
- Is it possible to speak of human-rights-in-place or place justice? If so, would such a possibility move attention and supportive efforts toward improving the places in which people and other living beings find themselves, rather than focusing only on the rights and needs of individuals and groups without consideration of their place context?

Questions relating to Covid-19:

- Will demands of Covid-19 have a lasting impact on physical places and bodily sociality?
- Can social media and virtual realities effectively replace face-to-face presence and physical places?
- Will human beings return to physical place and firsthand intercorporeality once the pandemic ends?
- Can human life really survive if people lose their direct lived relationships with other human beings and an entrenched physical involvement in real-world places?
- Does the crisis of Covid-19 demonstrate the central phenomenological principle that human beings-are-inured-in place? If that inurement collapses, is human life at risk?



Environmental & Architectural Phenomenology

Published digitally twice a year, **EAP** is a forum and clearing house for research and design that incorporate a qualitative approach to environmental and architectural experience, actions, and meanings.

One key concern of **EAP** is design, education, policy, and advocacy supporting and strengthening natural and built places that sustain human and environmental wellbeing. Realizing that a clear conceptual stance is integral to informed research and design, the editor emphasizes phenomenological approaches but also gives attention to related styles of qualitative research. **EAP** welcomes essays, letters, reviews, conference information, and so forth. Forward submissions to the editor.

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Exemplary Themes

- The nature of environmental and architectural experience;
- Sense of place, including place identity and place attachment;
- Architectural and landscape meaning;
- The environmental, architectural, spatial, and material dimensions of lifeworlds;
- Changing conceptions of space, place, and nature;
- Home, dwelling, journey, and mobility;
- Environmental encounter and its relation to environmental responsibility and action;
- Environmental and architectural atmospheres and ambiances;
- Environmental design as place making;
- Sacred space, landscape, and architecture;
- The role of everyday things—furnishings, tools, clothing, interior design, landscape features, and so forth—in supporting people's sense of environmental wellbeing;
- The progressive impact of virtual reality on human life and how it might transform the lived nature of "real" places, buildings, and lifeworlds;
- The practice of a *lived* environmental ethic.

For additional themes and topics, see the preceding page, which outlines a series of relevant questions originally published in the 25th-anniversary issue of **EAP** in 2014 (vol. 25, no. 3, p. 4).

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