Three Investigations for Clarifying Alexander's Properties of Life

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Abstract:

A brief summary (up to 150 words) of your article to help the reader quickly ascertain the paper's purpose. Please be sure to include:

- The problem/research issue addressed
- Your main results/findings
- The main conclusions and recommendations

Keywords: Keyword 1; Keyword 2, Keyword 3; Keyword 4; Keyword 5;

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1. Introduction

Christopher Alexander's four volume "The Nature of Order" presents a metaphysical vision by which all of life, in the broadest sense, is brought forth by relentless application of a single fundamental transformation which manifests itself through 15 properties of life. (Alexander, 2002a). He argues for the reality of these properties by providing evocative examples, especially in architecture, and by discussing how the properties function together. I personally like his vision and value his intuition. I therefore am curious how to define the properties so that they would be metaphysically sound and scientifically usable. What is a property of life? In what sense are there distinct properties of life? How many are there? What is the structure of the complete set of properties? I seek answers which would yield something like a table of physical particles or chemical elements.

For twenty years, Alexander spent two or three hours a day looking at pairs ot things and asking himself: Which one has more life? He asked himself further, about the examples which had the most life: What are their common structural, geometric features? He came up with fifteen structural features which are ways that centers help each other in space to come to life. (Alexander, 2002a, 144-145) As centers grow stronger, space grows coherent. The properties are the glue through which space is able to be unified. (Alexander, 2002a, 241) He describes them roughly in the order that he came to notice them: 1. Levels of Scale, 2. Srong Centers, 3. Boundaries, 4. Alternating Repetition, 5. Positive Space, 6. Good Shape, 7.Local Symmetries, 8.Deep Interlock and Ambiguity, 9.Contrast. 10.Gradients. 11.Roughness, 12.Echoes, 13.The Void, 14.Simplicity and Inner Calm, 15.Not-Separateness. Among these, Strong Centers has a kind of logical priority over the others, and Not-Separateness, which is to say, oneness with the world, is perhaps the most significant.

The number fifteen is only rough. At various stages in the evolution of this theory, I have had a catalog of twelve, fourteen, thirteen, fifteen, sixteen. The precise number is not significant. But I do believe that the order of magnitude of the number is significant. Throughout my efforts to define these properties, it was always clear that there were not five, and not a hundred, but about fifteen of these properties. (Alexander, 2002a, 241-242)

Alexander's vagueness is honest. However, I think the lack of a program for ascertaining a system of definitive properties has kept a scientific community from transcending Alexander's personal intuition.

I propose three investigations to lay a basis for scientific agreement with a rigor characteristic of mathematics, physics and other exact sciences. First, we may explore an illustrious fractal, the incredibly intricate Mandelbrot set, as an abstract testbed for identifying each property and expressing it mathematically. Second, we may collect evidence for cognitive frameworks from which we might derive the properties as basic to the human mind. Third, we may identify the properties with the purposes that artists and others attribute to creative work. These three investigations would allow scientists to agree on what they mean by the properties and in what sense they constitute a complete set.

2. Literature

Alexander believed that the properties of life are more fundamental than the patterns and pattern languages which he is best known for. The software developers in Silicon Valley who

embraced his ethos were very sympathetic to his new ideas. But from Amazon Best Sellers Rank it is clear that "A Pattern Language" (Nr.14,000) and "The Timeless Way of Building" (Nr.49,000) are vastly more popular than "The Nature of Order" Vol.1 (Nr.450,000) and Vol.2, 3 and 4 (Nr.700,000). (Amazon.com, Inc., 2017) Only 10% of Helmut Leitner's recent overview of pattern research is devoted to the properties of life. (Leitner, 2016)

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Leitner points out:

Every now and then I meet researchers who feel that the list of properties is incomplete or that the descriptions are not perfect. I therefore also suggest the completeness of the set of the 15 properties as an open research question. (Leitner, 2016)

For example, Markus Petz has remarked about the property of Simplicity and Inner Calm:

I struggle with this property, it seems to refer to a minimalist aesthetic and one that is decluttered, yet it does not seem to offer anything that is not already covered with other properties. I wonder if it is also a subjective cultural aspect. (Petz, 2017)

He is skeptical that we can be assured of the properties, and in any event, believes that we are prone to think of them as disparate elements, whereas they only apply in a spirit of wholeness.

There is a tension in Leitner's understanding of the fifteen properties. On the one hand, he believes that because they are constitutive of living systems, they are intrinsically positive features which can't be criticized for what they are. On the other hand, he sees that the properties are not simultaneously present because they partially contradict each other. He argues that each property can function as either a poison or a medicine, depending on the dose. Their positivity depends on their interaction and how the field of centers resolves their contradictions. Leitner proposes a sixteenth property, changeability, which means being continuously in transformation, and which he reads between the lines of Alexander's books. (Leitner, 2016)

Takashi Iba and his colleagues at Keio University have

Kohls and Köppe have

In addition, I believe the fifteen properties have something to do with our cognitive system. We probably can't describe systems without referring to differences, boundaries, and most of the other properties. So I suggest another favorable interpretation of the 15 properties as categories of form. If this interpretation of his work is accepted by philosophers, then Alexander belongs with Aristotle and Kant to a small group of thinkers who enumerated fundamental categories. (Leitner, 2016)

Properties of a good lecture: Domain coverage, Effectiveness, Motivation, Inspiration, Excitement, Flow, Economy, Engagement.

Takashi Iba generates many principles.

The basic strategies are as given: investigate pattern languages of human action in order to find out the mechanism that is creating the liveliness behind each pattern; verify the universality necessary for the properties of the mechanism by checking if they can describe

other patterns' liveliness; express how the discovered properties generate the mechanism for liveliness by illustration and description while thinking about the relationship between the properties.

Centers intensify themselves with their own energy: 1. BOOTSTRAP, 2. SOURCE, 3. SPREADING, 4.ATTRACTION, 5. INVOLVING, 6. TOGETHERNESS,

Centers grow by the influence of other centers: 7. BUILDING UP, 8. ORGANIC GROWTH, 9. REFLECTING, 10. ACCOMPANY, 11. ENHANCEMENT, 12. EMPATHY

Properties become strengthened when centers are in a complex situation: 13. SELECTION, 14. SIMPLIFICATION, 15. CONSISTENCY, 16. LOOSENESS, 17. FLEXIBILITY, 18. ABUNDANCE

Centers intensify with the differences or commonality that centers have: 19. ENDEAVOR, 20. CONNECTING, 21.POSITIONING, 22.DIFFERENTIATING, 23.OVERLAPPING, and 24.CONTINUOUS RELATION.

Present them in a way that would make sense to a blind person.

Claim the 15 principles can be considered as 3 perspectives and 12 circumstances.

Will ground this claim in 3 open-ended investigations for which research can gather evidence.

Alexander ultimately concludes that there is a single fundamental transformation underlying all of life. An intuitive way to investigate that is to study episodes in life where our own self-identity changed. I led such a workshop and preliminary results suggest that there are 12 building blocks for transformations of our self-identity.

Alexander draws on his personal intuition to describe the process of life in terms of 15 transformations which he calls the properties of life. He doesn't claim there are exactly 15 properties, and Helmut Leitner adds a 16th, mutuality. I will argue in terms of cognitive structures that Alexander's intuition is basically correct and comprehensive. I will distinguish three of the properties - strong centers, strong boundaries, levels of scale - and account for the other 12 separately.

Problems with Alexander's approach - he does not make explicit what human consciousness contributes to the process. The act of making patterns explicit - even as timeless "rules of thumb" - gives them a life.

Creating from a sense of peace - even a tentative sense - but even more so, an absolute sense.

Iba's purposes do not include enriching the sense of wholeness - his are 1) bridging the gap between designers and users, 2) bridging the gap between expert and non-expert designers, 3) connecting people who have different experiences.

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Whether patterns are simply best practices. And what does it mean to have best practices for suicide, genocide, creating alcohol, cars, nuclear power plants, for recruiting members to the Communist party, for watching television or for classroom learning.

Alexander's example (Timeless Way of Building) - a parking garage (290) - how does it make us feel? Madhouse balcony (283) - not a pattern.

3. Mandelbrot Set

1) Mandelbrot set - a testbed for mathematically and algorithmically attesting the properties

I rely on the Mandelbrot set, an endlessly intricate mathematical structure, for the sake of illustrating these properties. A separate investigation of the Mandelbrot set could show how to define these properties as mathematically real.

4. Cognitive Frameworks

Our minds, in thinking about participation, make use of three perspectives, a cycle of taking a stand, following through and reflecting. This cycle is the basis for the scientific method: affirming a hypothesis, testing it with an experiment, appraising the results, and then affirming a new, improved hypothesis.

In living this cycle, and being perfected by it, we exhibit a perfect stillness which may be deep within us or may be far beyond us. This stillness is what defines a center as such. For example, the center of the earth is the point to which it gravitates, but also the axis along which it rotates. Stillness is an invariant, and thus a sign of a metalevel higher than our own.

Centers stand out from the activity around them. And that activity distinguishes the centers from each other. The conflicting activity inevitably is separated by a boundary of stillness, like the line which separates traffic on the right and left sides of a road. There is likewise a stillness, albeit as thin as possible, which keeps level and metalevel distinct.

Every pattern works on four levels: recurring activity, structural solution, competing forces and optimized preferences. There are eddies of stillness within activity, a core of stillness in a structure, a web of stillness across forces, and an overall stillness in the decree of the creator. Thus we have a range of stillness, from narrow to broad, reflecting how God has gone within us and around us from beyond us.

Stillness is unknowable. Grappling with stillness gives rise to 4 mind games which yield 12 circumstances, that is, 12 empty slots for our imagination to fill. They are rather similar to Kant's 12 categories.

Robert Genn has collected about 100 quotes about the purpose of art. In sorting these quotes, I came up with 12 different answers. Each answer finds the purpose of art to be in one of the 12 circumstances I will present to you. And each answer inspires one of Alexander's transformations.

Significance is the narrowest form of stillness. No matter how immersed we are in life, we have a speck of stillness from our metalevel. In the spirit of Descartes, if thinking is significant, then being is significant, but then doing is significant, and then again thinking is significant. Our creative purpose may be to be ourselves, and so we create roughly. Or we may live as a tool of art, and so we vary continuously, yielding gradients. Or we may master a conceptual language, and so we respect relationships, and value nonseparateness.

Constancy is the stillness of something, such as the core of a structure. Let us search for constancy. Either we find one example of constancy, or we don't, in which case all is constantly unconstant. And each time we select and inspect something, we suppose they stay the same, and so are multiply constant. Thus we define "one", "all" and "many" as circumstances wherein we can imagine stillness, a center, a purpose. You immortalize in a work of art by making a good shape; transform the world by tiling it symmetrically; inspire creativity by dividing space positively.

Directness is the stillness of anything, as in competing forces. Our attention can be directed to something else, an object, but then can become directed to itself, yielding a process. And a subject is the one whose attention is directed. Similarly, your bring out what is unnoticed by contrasting; you lose yourself in the joy of creating by echoing; and you foster sensitivity to feelings by interweaving, thus creating ambiguity.

Truth is the stillness of everything. For truth is what can't be hidden, what will be revealed, what is obvious, which all makes sense in the metalevel. Truth demands that we be rational, give up our emotions and our very selves so that we can weight, without prejudice, God and the individual, what is true and what shows it to be true. If they are one and the same, then truth is necessary; if one follows from the other, then truth is actual; and if what is revealed is their relationship, then truth is possible. If your purpose is necessary, then you get into your role by simplifying; if you want to present reality, then you must free a path, opening up the void; and if you want to open up possibilities, then you alternate extremes. The formal nature of truth means that we are perfectly free to objectively compare opposites, namely, life and love, yang and yin, what is with what is not but makes room for it.

Systematizing these explorations, we are validating Alexander's intuition, but also we are clarifying what kinds of purposes we can imagine. For example, the void is not a purpose, but rather, a clearing which results upon freeing a path for the sake of presenting reality. The stillnesses of nothing, something, anything and everything allow us to think, analogously, of centers of different scope. We can imagine a God who questions whether God is necessary, and thus creates godless conditions for us and our answers. Immersed in life, we are unconsciously, emotionally driven to reject aspects of our world, to seek a higher purpose, and thus step out of ourselves and take a rational, truthful view, that of peace.

Compare with my original idea in 2003.

5. Purpose of Creative Activity

More than 100 quotes

6. Questions for Independent Thinkers

7. Conclusion

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Andrius Jonas KULIKAUSKAS is a Lecturer at Vilnius Gediminas Technical University. As a child, he dedicated himsef to know everything and apply that knowledge usefully. He has a B.A. in Physics from the University of Chicago and a Ph.D. in Mathematics from UCSD. From 1998 to 2010, he led Minciu Sodas, an online laboratory for serving and organizing independent thinkers around the world. He teaches Philosophy, Ethics and Creative Writing. He is currently investigating How do people behave?

9.1. Headline 2

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9.1.1. Headline 3

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Figure 1: Dependencies between A and B. (name the source, if the figure is taken from/adapted from another publication – this source will need to allow re-publication under a CC licence)