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# Teaching the Nature of Order- Draft

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## Introduction

Alexander's magnum opus *The Nature of Order* (Alexander, 2002-2005) changed and shaped my life as a professional and academic. This essay describes the book, its teaching over the years, and the impact it has on our students. The essay starts with a short summary of the four books, and their place in the development of Alexander's thought. It continues with describing how I came to be interested in Alexander, my experience of studying and working with him at Berkeley and its influence on my development afterwards. The seminar on these books, taught over the two semesters of the program is the main theoretical basis for [Building Beauty](#) – a post-graduate program in architecture, which we started in Sorrento in the fall of 2017, and is now taught also online. The course has evolved over the years, and it is now partly also a free [webinar](#) that allows people from all over the world to get a glimpse at Alexander's theory.

*The Nature of Order* transformed the way I look and see the world. Our post-course survey shows that, substantially, it has a similar impact on our students. The essay concludes with a short reflection on some of the ways it still falls short of describing living process, and on the importance of its vision of life, wholeness and beauty as a scientific and spiritual basis for resolving the multiple ecological and civilizational crises faced by humanity.

## What is the Nature of Order?

With *The Timeless Way of Building* (1979) and *A Pattern Language* (1977) Alexander hoped that he gave people a tool with which they could create places that have “The Quality without a Name”, similar in quality to the traditional examples these books are full of, but appropriate for our time and culture. However, Alexander felt that, while the houses built using pattern languages by other people were nice, and more humane, they did not have the same strength as the buildings that were created in traditional society. They were not as beautiful, strong, and moving emotionally as the examples that one could see in traditional and vernacular architecture, or in traditional arts and crafts.

Alexander realized that, despite providing a good account of socio-spatial patterns that worked throughout human history, from a functional, social and psychological aspect, *A Pattern Language* did little to describe the formal, geometrical aspects of objects and places that seem to have life, and with which we are able to connect emotionally.

So, he turned his thinking towards trying to figure out what was it specifically in the geometrical form of things that have life that gave them that character. That exploration took something like 25 years starting in the late 1970s early 80s, and finally published in beginning of 2000s in the four volumes of *The Nature of Order* (2002-2005). It turned out not to be just about the geometric form of things, but even more so about the process of making things, in how you make beauty, and ultimately in the underlying conception of the world by all the people involved in the act of making.

Alexander became convinced that it was not possible to achieve buildings or settlements that have wholeness, life and beauty, and I use all three of these terms at once because they are rather interchangeable in the text, within the existing process of procurement and building, either private or public. The very process that exists at the moment, a process that is based on the separation of design from building, development which has the maximization of profit as its goal, the fragmentation of responsibility for the built environment and the distancing of control of the built environment from the people who actually live and work in the places that are produced, all make it very unlikely to achieve a living built world.

At the basis of the difficulty in achieving a living world lies the question of value. Already in the *Timeless Way of Building* (1979) and *A Pattern Language* (Alexander et al., 1977), Alexander posed the hypothesis that certain kinds of spatial configurations allow us to feel more wholesome, free from internal conflicts and comfortable, and thus improve our sense of well-being. In fact, much of the criticism of those books denounced this ethical objectivism as arbitrary, or as imposing on the world "West coast values." Critics felt that architecture should reflect the contemporary lack of a privileged system of values, or a shared moral basis for architecture, and therefore uphold the freedom of expression of the individual architect (Dovey, 1990). *The Nature of Order* delves deeper into the question of value, and the surprising connection between the structure of the world in which we live, and our own sense of wholesomeness and well-being.

The divorce of value from our conception of the world has its origin in the mechanistic world view which dominates our scientific culture. This exploration further led Alexander to question these very foundations. In the end, according to Alexander, the reason for our inability as a culture to create deep wholeness, beauty and life, is the dominance of the mechanistic world view. A world view in which questions of value cannot have a meaning, but are always external to the mechanism, arbitrarily imposed from without. This leads him to postulate a transcendent reality. A reality that serves as the ground, or source of all life, and which when we are building, making, or shaping our world, we are able, if we pay close enough attention to create the "centers" that allow us to connect with that ground, or allow the light which is that ground to shine through.

The first book called *The Phenomenon of Life* starts with a recognition that places, events, people and artifacts have life, and we're able to feel that life through our own sense of being alive. Life exists to a degree in each bit of space, depending on its spatial geometrical configuration, and the way it relates to its context, or the *wholeness* it is embedded in. The central concept established by the book is the concept of *centers*. A center comes to life, by cooperation and definition by other centers, and itself

contributes to the life of other centers and the larger wholeness in which it is embedded. The difficulty with the definitions of centers, is that the definition is recursive, as a center is defined as a field of other centers. However, there is no way around that, as centers are a fundamental concept, and can only be understood within the field they help form with other centers.

Alexander describes the *15 fundamental properties* which exist in things that have life (either natural or artificial). These can also be understood as 15 ways in which centers can help each other to bring the wholeness to life. To understand the 15 properties properly relies on seeing the centers in the configuration. One cannot apply them mechanically because they are relationships between centers. It is also not easy to diagram the centers, as any abstraction of them will also have to be a field of centers in order to capture their particular character. In the end they must be felt, so even in that sense the definition of centers is recursive because you rely on feeling to recognize centers, and yet the centers are what brings out feeling in us, or what touches us and our feelings.

This brings us to the second claim of book. The affinity between a well-formed field of centers, or wholeness, and our sense of self. Looking at the wholeness is like looking at a *mirror of the self*. This allows us to make distinctions between objects, places, events and even people. Our ability to judge wholeness in the real world grows with our ability to recognize our own self. However, this self is not only the unique individual self that each one of us has, but also includes a shared self, that touches what is shared between us as human beings, and perhaps what is shared between us and all beings.

Throughout the book Alexander makes a point of showing wholeness, life and beauty in nature, as well as in human artifacts from different cultures. This is to convince us that the wholeness and the field of centers are objective facts, and are not culture dependent, or a result of our cognitive apparatus. In fact, he points out that our own 'modern' or industrial culture, is unique throughout history in its relative inability to create wholeness, or objects and places which have a well-formed field of centers. The failure to create living structure is a result of the mechanistic understanding of the world, our inability to see the wholeness, and our disregard for feeling as being entirely subjective and therefore non-important.

The second book, *The Process of Creating Life* grapples with the question of how living structure is created, in nature and in human artifacts. Alexander describes the *Living Process*, which lies at the basis of the millions of detailed processes that create life in nature, and the human cultural processes that were able to create life and beauty in the traditional cultures. The key point in the book is the idea of *structure preserving transformations* (SPT's) or as Alexander later called them: *wholeness enhancing transformations*. At each point in the process, some centers in the wholeness are more developed, and some are still latent in the configuration. SPT's are the emergence of new centers that embody the latent centers – and thus strengthen the existing centers, make the field of centers stronger and enhance the wholeness. In doing the SPT feeling is a key guide to recognizing where the weaker areas are in the wholeness, and for judging whether our intervention is increasing or decreasing the wholeness.

In this depiction of the life and beauty as the outcome of a particular kind of process, the failure to create living structure is due to the fragmentation of building processes, and the lack of feedback structures that allow feeling and the personal sense of well-being to be the governing criteria in making development, design, and construction decisions. At the basis of our inability to create life and beauty lies not just our difficulty to grasp the wholeness, or our reluctance to rely on human feeling as a criterion for the success of development, but stronger cultural, legal and economic structures. Even when we are fully aware of the wholeness, and attempt to increase its life and beauty, we come against the established separation between design and construction, often mandated by law, and embodied in standard contracts, the nature of the planning process, and the rules and expectations of all the players in the real-estate market, which are driven by profit, and not by the increase of life and beauty in the land.

The third book, *A Vision of a Living World*, was originally part of the second book, but as that book grew bigger, Alexander decided to separate it into two volumes. The book is an illustration of the processes that could succeed in making wholeness in today's world. Differently from the first and second book, where the structure and process of things that have life are described in more general terms, this book is more specifically about building and planning processes, in response to typical problems of urban design and building. The main problem that the book engages with is the problem of connection, making a world in which people are able to connect once again to themselves, to each other, and to the earth as a living entity. The examples are mostly drawn from the Center for Environmental Structure's own work. It looks at typical urban and building design problems such as site planning, organizing the massing of a building, designing a building's structure, planning or renewing a neighborhood, laying out the public space of streets and squares, enabling communities to be controlled by their own people, dealing with high density housing in a way that allows each home to express the individuality of families, designing beautiful and comfortable rooms, down to the making of ornament that enhances the structure of a building and brings it all to life. At the end of the book Alexander envisages a whole different way in which building and architecture is organized, in order to be able to allow this vision of a living world to emerge.

Finally, in the fourth book, *The Luminous Ground*, Alexander goes deeper into the nature of centers, and the connection between living structure, and our feeling of self or the "I". The "I" is, to quote his own words: "the interior element in a work of art or work of nature, which makes us feel related to it" (Alexander, 2004, 2). His belief is that the nature of matter is "soaked through with self, or I" (ibid., 8). This means that our sense of self is not just a product of mechanistic processes in the brain, or between the brain and the body, but on the contrary, a real thing, which exists in all matter of the universe and which, obviously, we share with the whole universe. Here, then is the core of the problem of our inability to create beauty and wholeness in the world. It lies in our fundamentally mechanistic view of the world, which in the end, does not take the sense of self seriously enough, and cannot conceive of all existence as endowed with it. This conception leads Alexander to reinterpret the idea of *center* as a window, an opening to that luminous ground which lies below or behind all existence. Thus, a well formed field of centers, a particularly beautiful place in nature, the crashing waves at the sea shore, a

work of art, a piece of furniture, a beautiful room, or a wonderful street are able to connect us with that ground.

## My experience with the Nature of Order

I discovered Alexander, as a high school student when I was searching for something on rationality and architecture. I read *Notes on the Synthesis of Form* and it made a huge impression on me, so I started looking for everything I could find that he wrote. By 1979, as I was getting ready to start my studies in architecture at the Technion, I already bought and read the first three books in the Center for Environmental Structure series (Alexander et al. 1975, 1977, Alexander, 1979).

I tried to use patterns in my design studios and encountered firsthand how little guidance the book actually gave to geometric form. While it was clear how to use patterns to create a qualitative program for the project, and for the spatial organization of the plan, there was no guidance in it on what should be the form and details of the buildings in the end. What do they look like? What are they made of? How are they shaped? I also encountered the enmity of some of the teachers towards the more traditional aspect of the spaces, and the way that they were defined by the structure of the buildings that I designed, rather than being intentionally divorced from it and “free flowing”.

When studying a few years later at Bezalel, Jerusalem School for Art and Design, and doing some work at architect Nili Portugali's office in Tel Aviv, I first came across the manuscript of *The Nature of Order* as it was in the early 1980's. Nili spent a year at Berkeley, took some courses with Alexander's, and also collaborated with him on the planning of Shorashim, a village in the Galilea. I remember reading about the *15 properties* and the *mirror of the self* test for the first time, and it made a huge impression on me because it seemed to solve problems with which I was struggling in my own work as a student and as a beginning professional.

In 1990 after I finished my bachelor's degree and worked as an architect for a few years, I went to Berkeley to study with Alexander, and I did my Master of Architecture with him. That year Alexander for the first time lectured on *The Nature of Order* to undergraduates as well. It was a big class of about 160 students in the main auditorium of the college. Alexander recorded the lectures in the hope that they would help resolve some of the issues that he felt to be still unresolved in the books, or that some of the questions by the students would bring out issues that had to be addressed that he hadn't thought about. He was looking for someone to transcribe the lectures, so I applied for the job. It paid a little bit of money, which I definitely needed, and it was an opportunity to work closely with him on the book. Therefore, I heard those lectures, not only one time in the auditorium, but several times each because I was working with a small cassette tape and as I typed I had to go back, rewind and listen to some sentences again. The transcribing work developed, later in the year, to working directly with him on aspects of the process as described in book II.

In the first year it was just a lecture course. The graduate students had a one-hour seminar with Alexander after the lecture, which gave them an opportunity for discussion and experimentation with

the concepts presented in the lecture. The undergraduate students did not have any way to exercise and use the concepts in practice. In the second year, we decided with Alexander, to add discussion sections for the undergraduate students. This required six graduate student instructors, and I was the head instructor responsible with organizing this teaching. Working with the undergraduate students, and with my fellow teaching instructors helped me reach a more profound understanding of the books as an outcome of having to answer and respond to students' questions and discuss the parallel experiences with my colleagues.

I came to Berkeley with the intention of studying with Alexander, and in that year the Building Process was established as one of the Areas of Emphasis in the department that students could concentrate their studies in. Together with *The Nature of Order* I was taking the introductory design studio to the Building Process with Alexander and Hajo Neis, and also participating in a construction course where I was working in construction on one of the CES's projects. Often, it felt that the theory in *The Nature of Order* was like a commentary, or an instruction book for the studio. Whereas sometimes the studio, or the work in construction, was helping me understand the concepts of the theory. There was a very intimate connection between the theory and the practice, and I don't think it is really possible to understand the theory unless you actually try to implement it in practice, nor is it possible to do the practice well if you don't understand or at least are exposed to the theory.

*The Nature of Order* continued to shape my professional and academic career. In my Ph.D dissertation I showed empirically that people's feelings in their neighborhood environment were rather similar, and that they depended more on where they were in the neighborhood than who they were sociologically and demographically. To do that I have developed a method of mapping feeling that has proven to be useful for public participation in neighborhood planning and urban design projects (Rofè, 2004, 2014).

## The Nature of Order in the context of Building Beauty

When we set up the Building Beauty program in Sorrento five years ago, it was obvious that the core theoretical course will be based on *The Nature of Order*. The vision of the program was basically modeled on the vision of the Building Process Area of emphasis as it was set up by Alexander and Neis in the beginning of the 1990s at Berkeley, and as it existed there until the end of the 1990s when Alexander retired and Neis left for Oregon. It is based on the theory developed in *The Nature of Order*, on a design studio, that builds up the student's understanding of self, and the use of one's feeling of wholeness to make judgements and choose between alternatives in the process of design and making, and on the actual making of objects and places, which allows for continuity between design and construction.

We decided to do it as a seminar course for the students. I've experimented with teaching the first book of *The Nature of Order* to non-architecture students at Ben Gurion University. I have never wanted to give it as a lecture course, because teaching it like that would necessarily entail interpreting it for the students in my own particular way. I felt that it was much better to do it as a reading seminar where each session we would be reading two or three chapters. I feel that this method of teaching is less

authoritative and lets the students encounter Alexander's text directly on their own terms and find their own special understanding of the concepts. I would usually present the introduction and conclusion chapters. Sometimes I would give a short lecture about some of the concepts that I felt were important. We would also do some exercises to understand the concepts more profoundly and discuss these exercises in relationship to the text. Often the students would bring ideas and thoughts from their own readings and experience, and that would enrich the intellectual content of the course. Already in the first year, because I couldn't be in Sorrento the whole academic year, but only in the second semester, some of the lessons were taught where I was online, and the group of students in a room at the Sant'Anna Institute.

In the second year, because of our wish to open the program to people from all over the world and also because we wanted to make it easier for invited lecturers to come and talk to the group we started experimenting with online teaching. It was the first year we opened the course up also as a webinar to people all over the world. In fact, in the third year of our existence, that was the only course that was given because we didn't have enough students to open the course in Sorrento. Last year, because of the travel restrictions brought about by Covid-19, online teaching became our main teaching method for all the courses. The course took on a somewhat more complex form where we combine a seminar with the registered students with an open webinar that is free and open to everyone.

In the third year, I was joined in teaching the course by Architects Munishwar Nath Ashish Ganju (Muni) and Narendra Dengle, authors of *The Discovery of Architecture*. We have tried to combine the teaching of that treatise, which has many similar and complementary insights to *The Nature of Order* in the course. An experiment that did not work, perhaps because within the vast scope of *The Nature of Order*, it was hard to devote to *The Discovery of Architecture* the attention it deserves. Muni and Narendra remained on the teaching staff, and were later joined by Savyasaachi, an anthropologist and sociologist. They all brought valuable insights and approaches based on their knowledge of Indian culture and traditions, and their own professional experiences.

Gradually the methods of teaching the course changed. The reading seminar was kept as the main teaching method for Books I and II. Three years ago, we began to change the approach Book III: *A Vision of a Living World*. This book is more specifically about planning, design and construction of buildings, and discusses typical problems in the field, and solutions to them that are mostly based on Alexander's own practice at CES. Rather than discussing Alexander's examples, we started inviting other practitioners to show their work, and discuss it in the context of the relevant chapters. Some of them are former students of Alexander, others are professionals who have found their own ways to his insights, or who hold similar and compatible views of design, building and making. Several of them are also regular participants in the webinar. The reasons for the change are twofold: one to bring in the experience of other practitioners, and show the students that it is possible to practice the living process, aiming for the achievement of wholeness and beauty, even if you are not Christopher Alexander; two, to separate the ideas and practice from his own particular personality, and show the students that it is possible to use the living process in different ways than his. These lectures were also an opportunity to connect with people in the world who practice and do things that are similar or akin to Alexander's way



of doing things, but without even being aware of him. The responses we have gotten from the students and participants show that these lectures have been very well received, and they have also connected us to many more practitioners.

The teaching of book IV: *The Luminous Ground* was always a mix between the two methods: the reading seminar and the invited lectures. In this last year of the webinar there is actually a departure. While the students in the seminar continued with their readings of the chapters, followed by discussion in class, the invited lectures this year were critical lectures of *The Nature of Order*, and Alexander's body of work as a whole. Lectures either exploring alternative explanations to his observations, connecting his work to other disciplines, or placing him in the context of philosophy, theology and the psychology of knowledge.

## Impact of the course

When I took the Nature of Order course at the beginning of my Master's of Architecture, reading the book, hearing Alexander's lectures, and in parallel working in the studio, has significantly changed my way of looking at the world, and it has done so forever. It began a shift to seeing centers and their interaction everywhere, and as a result being more aware of the space between objects (and within them), and the operative forces in human events. It is as if objects disappear, and only a web of relationships exists.

At the end of each year of teaching *The Nature of Order* at Building Beauty, we carried out a survey to learn to what extent the students' outlook on, or conception of, the world has changed as a result of being exposed to the books and discussing them. We ran the survey separately to our registered students in the seminar, who are also usually taking other courses with us, and to the participants in the webinar, who are by nature a much more diverse group, and are also less invested in the study.

The survey includes several questions that gage the level of comprehension of the theory by the participants, and their level of acceptance of it. For example: Did *The Nature of Order* make you question or change the picture of the world you had? Please explain why it did or didn't? What is a center? What is the field of centers? What do we mean when a place, an object or an event is alive? What is the nature of our feeling towards objects or places? What is the principal aim of building and construction? Is value in the environment objective or not? The level of agreement with the statement that space and matter are inert and subject only to mechanical laws which in principle are able to explain everything there is to know about the world; and the level of agreement with the statement that science has nothing to say about spirit, the soul and God. Most of the questions are multiple choice, or an evaluation of agreement with the statement on a scale from 1 to 5, but there are also some open questions that allow the students to freely express their views.

The results show that most students and participants accept Alexander's structural analysis of buildings and objects, and the conception of centers as focused areas in space (about 85% of responses). A majority of them agree that the field of centers is a real phenomenon that goes to the core of how the

world is constructed (73% of the webinar's participants and 58% of the seminar students). Most of the students and participants are willing to entertain that value in the environment is an objective matter and has to do with its degree of life (90% of them either strongly agreed or agreed with the statement). Participants were willing to accept Alexander's challenge to the mechanistic conception of the world (over 70% of students and 90% of webinar participants either strongly disagreed or disagreed with the statement that asserts that the world is subject only to mechanical laws and that they will be able to explain all there is to know about the world). However, there was somewhat less certainty among students about the connection possible between science and an understanding of the soul, spirit and God (only 54% of the students disagreeing with the statement that science has nothing to say about these matters, with the rest being undecided; among webinar participants 75% disagreed and the rest were undecided).

Here are some of the things students and webinar participants wrote on how reading and studying *The Nature of Order* changed their view of the world:

"... I feel that I found in the readings the true meaning of architecture, which is essentially humanist."

" Broadly speaking it didn't dramatically change my worldview, though it has definitely deepened my understanding of the world as being interconnected through giving me further tools and processes to attempt designing in a holistic manner. Having my mistakes in perception (designing from a place of separation) reflected back to me in studio has taught me invaluable lessons and were always 'mistakes' that were a joy to make. There is so much in my conditioning that is oriented in separation that is hard to shake loose, but in making the unconscious conscious I feel like I'm heading in the right direction, and starting to make more decisions from that place of wholeness. That's by no means to say I've got it completely, but I feel like I'm developing confidence in perceiving, working and being in this way."

"The Nature of Order, as Alexander describes it, is broadly compatible with ecological, developmental, and Taoist views on the world. I feel very comfortable with Alexander's way of seeing things. Where I felt challenged was imagining how I might apply his methods and practices in my work; they seem right, but very different from the conventional way of doing things."

"His principles and processes for identifying and adapting structure to context were new to me and have already totally shaped how I go about repairing and influencing my decisions in design, adjustment, repair and construction of the world around me. In particular when working on the various properties I have the pleasure of helping to build up, the principles and patterns and approach he lays out became immediately useful once read."

"Through sharing thoughts and ideas from the series on Twitter and with friends in person, I've met amazing folks of high resonance that are interested in creating a beautiful world as well. It's been a wonderful experience :)"

## Conclusion

*The Nature of Order* is the summation of Alexander's life and work. As he writes in the acknowledgements at the end of book IV dedicating these words to his students over the years at UC Berkeley: "The continuous re-writing I have done for twenty seven years has been largely stimulated by my effort to give them something more clear, each year, and my wish to make it worth the time which they spent studying it." (Alexander, 2004: 350).

I have by now spent a similar amount of time studying this magnificent work. Learning it first directly from Alexander's lectures in the early 1990's. Reading it when it came out about a decade later. Teaching it to students, both of architecture as well as other fields, discussing it with colleagues and participants in the webinar from all over the world, different levels of knowledge and experience, and many diverse outlooks. There isn't a time I prepare for a class, read a chapter, or discuss it, that I don't find a new insight, some statements that I haven't noticed before, some ideas that help me think through problems that I am pre-occupied with. Alexander main vision, which ties together the idea of life and the configuration of space, that eliminates the separation between our own self, and the objective reality of the world, and that potentially unifies the building processes of human beings with the living processes of the natural world has the potential to pave the way to a science, technology and a spiritual belief system that is urgently necessary to help us resolve the multiple crises of human civilization with which we are confronted.

I am not in complete agreement with everything Alexander writes. The living process he describes works mainly through differentiation and integration at the local scale, but the living processes that create the living world work at many scales, and so do cities in history. Large scale order is often imposed from above, but then gets elaborated, softened, eroded and adapted at the smaller scales. The role of competition, conflict and strife is fundamental in the natural world, and probably in the evolution of human society, just as much as cooperation, but is not understood well within Alexander's description of living process. I believe there is still work to be done to understand living process better. I also share the students' unease about the statements of book IV. I am uneasy about a transcendent reality underlying our world, as was Alexander himself about this notion, although I must say that I haven't found any good alternative explanations as to what 'ultimately' are centers. Not being a religious person, I find the reference to God more disturbing than illuminating. The grandness of the universe, our own fleeting moment within it, the intricacy of life and its fragility, the beauty of the world, that humans are able to touch and emulate, if they just pay attention to it and to the way it resonates with our own self - these are enough for me as an ideal to strive toward, in my teaching of *The Nature of Order*.

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