In ***Systems intelligence: A new lens on human engagement and action***, eds. Raimo P. Hämäläinen and Esa Saarinen: pp. 65–79. Espoo: Helsinki University of Technology, Systems Analysis Laboratory.

Chapter 5

Alexander, Architecture and Systems Intelligence

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Architecture is basically about relatedness, as is systems intelligence. Christopher Alexander is an architect and a scientist who has argued the case for a living and profound connection with our built environment. Systems intelligence suggests perspectives on living in complex systems. In this chapter I will study the interconnections of systems intelligence and Alexander's approach, suggesting that they share certain key convictions. Both provide powerful perspectives and tools for the study and practice of architecture.

An Introduction to Alexander

Christopher Alexander was born in 1936 in Vienna, Austria, grew up and studied mathematics and architecture in England, and received his doctorate at Harvard University in the U.S.A. In 1963, after working for some time at Harvard and at MIT, Alexander became professor of Architecture at University of California at Berkeley, where he taught continuously for 38 years.

Alexander's first book *Notes on the Synthesis of Form* (1964), although about architecture, also influenced the study of artificial intelligence and programming language design in computer science during the following decades[1]. Starting in the late 1960s Alexander developed his "pattern language" idea (Alexander 1979, p. 186), creating a generic and extremely adaptable pattern language for building in different scales. He developed the concept in *The Timeless Way of Building* (1979), presented (with other writers) the patterns with thorough comments in *A Pattern Language* (1977) and reported the appliance of his theories in real building projects in several books, e.g. *The Production of Houses* (1985).

[1]In fact, this may relate to the phenomenon, confusing to an architect, that searching the databases in the Internet with the word 'architecture', you end up with a lot of references to computer science and astonishingly few to building. It may be that by adopting Alexander's ideas in the programming language developments people seem also to have adopted the word architecture to replace concepts like structure, constitution or layout. Maybe this highlights the focus not only on forming structures, but structures with internal coherence and grace.

The central ideas in Alexander's theory include insisting on people's own ability to build their houses, neighborhoods, and even towns: "The people can shape buildings for themselves, and have done it for centuries, by using languages which I call pattern languages" (Alexander 1979, p. xi). "Once the buildings are conceived this way, they can be built, directly, from a few simple marks made in the ground – again within a common language, but directly, and without the use of drawings" (ibid., p. xiv). "These pattern languages are not confined to villages and farm society. All acts of building are governed by a pattern language of some sort, ..." (ibid., p. xi). "Finally, within the framework of a common language, millions of individual acts of building will together generate a town, which is alive, and whole, and unpredictable, without control" (ibid., p. xiv).

Alexander studied and sought out examples of timeless, comforting and even nourishing features in every level of the human built environment, from cities to houses, from interiors to ornamental details. He then formed a collection of 253 patterns that could be used in a generative way in creating better environments for people. The inhabitants or users would participate in every stage of this gradual planning/building process. The patterns would work in a hierarchical structure, always based on the particular conditions of the site, but forming a networking system, that would at every stage offer several choices for advancing. Thus, every house would be both similar to the nearby houses and totally unique, depending on the set of patterns chosen for each individual enterprise. Alexander compares this pattern language to spoken languages, where every individuals usage of the language is unique, although all share the same grammar and basic vocabulary.

Alexander's approach was strongly opposite to the mainstream attitude towards building and architecture of those years. The building industry was impregnating the market with standardized, mass-made building parts, the scale of housing projects was increasing at the same time as the time resources for planning and building were decreasing, and the faith in the superiority of the new solutions reigned. The profession of architecture was getting more and more divided between urban planning on the one hand and the design of buildings on the other. The connection between the future users and the planners and designers had deteriorated, excluding maybe the commissions of wealthy house-builders (and even they sometimes had to fight to get their views accepted by the architect!). But very few professionals saw a real possibility of returning to local decision-making, self-help housing, and hand made details, which seemed indispensable when applying Alexander's patterns.

No wonder then, that Alexander's views did not at first gain the attention and effect they could have. I recall, when first making acquaintance with Alexander's writings in the 1980s, a distinct sadness over the fact, that these books were not compulsory reading for every designer- and planner-to-be. Yet I feel Alexander may have contributed to the negative reception of his ideas by objecting too one-sidedly to all authorities and to all official planning. Alexander's thoughts on building did, however, win numerous followers throughout the world, and over the years his work has not only taken a firm position in the theory of architecture, but also affected and enriched the practices of the profession.

Towards the end of the 20th century Alexander continued his practice and carried out further research and development concerning his theories. In this

millennium he has collected his legacy of a living environment in a four volume series *The Nature of Order*. Alexander's work still continues, maybe even on a broader basis than before. Besides his books, his teachings are nowadays available to a wide public via the Internet (www.patternlanguage.com). In this latter forum Alexander has developed the concept of patterns into a more flexible system of sequences. He has also conformed to some restrictions of our institutionalized society, offering people tools, not only to work without authorities, but also to work with them.

The Nature of Order

In *The Nature of Order* Alexander states his fundamental findings and elaborates on them with many examples, using both text and pictures. The key concepts include:

- The concept of Life, as a quality: "a general condition, which exists, to some degree or other, in every part of space: brick, stone, grass, river, painting, building, daffodil, human being, forest, city." (*The Phenomenon of Life*, p. 77) Alexander suggests that people are in agreement about the "feeling of life", and irrespective of their culture, age or education, when confronted with spaces or artifacts.

- The concept of Wholeness, existing in space and modellable in mathematical terms. "The wholeness is created by parts; the parts are created by wholeness" (ibid., p. 84). Wholeness is a character of things, and is something deeper than features (ibid., p. 96).

- The concept of Centers, as organized of zones of space. "Centers are coherent entities, often marked by local symmetry, by differentiation, by the presence of a boundary, and by convexity, which co-operate to cause a field effect." (ibid., p. 121)

- The concept of a Living Structure: "A structure gets its life according to the density and intensity of centers which have been formed in it" (ibid., p. 110). Alexander proposes that a living structure impacts human life by enhancing the feeling of freedom. In volumes 2 and 3 Alexander discusses the ways in which living structures can be created.

- The list of 15 properties that allow centers to help each other. These are described in detail in chapters 5 and 6 in *The Phenomenon of Life*, and their use as a tool of design and planning is further developed in volumes 2 and 3.

- The nature of order as something personal, as a way of including the "I" in the world-picture: "... ultimately we must understand the awakening of space, which occurs when a center gets more life, as a measure of the degree to which that center becomes associated with the human 'I', or self." (ibid., p. 439). In volume 4 Alexander elaborates on the understanding of space as a material that is capable of this awakening.

In the four volumes on the *Nature of Order* Alexander thus proposes a new coherent basis for nothing less than all of Architecture; "a platform which gives architecture new content and meaning" (ibid., p. 442). This is a bold enterprise that aims to salvage architecture from the alienation caused by modernism.

After decades of work, Alexander's message is getting through: e.g. Nyman (2006) suggests in his thorough review of these four books that Alexander may be the most important architectural theorist of the past century, alongside Le Corbusier.

Le Corbusier argued for disconnecting architecture from its past history and developing it towards an "independent art". According to Diane Ghirardo (1996, p. 9) "... the ideas of most Modernist architects retained as an underlying constant a belief in the power of form to transform the world, even if it was usually linked to some vague broader goals of social reform". Thus in practice the human conditions were often overpowered by formalism. In much of the modern architecture this negative attitude still prevails and is something that should be rejected.

Against all dehumanizing tendencies in architecture, Alexander urges for a return back to the people, or in other words, to get the human perspectives back as the central premises of architecture. We may not agree with all the methods he proposes or we may be doubtful as to what extent he succeeds in bringing the theories into practice, but we must agree that the aim is just, the effort is thorough and enormous, and the message is well worth hearing (see also e.g. Kruft 1994, pp. 443–444, Johnson 1994, p. 98, and Farmer 1993, pp. 334–335).

Architecture as a System

Architecture is a word of many meanings (see footnote 1 on page 65). According to the dictionary[2] it is used varyingly to describe the art, practice, or profession of designing and erecting buildings. It can also mean a particular method or style, or refer collectively e.g. to all the buildings of a place. Sometimes it is used to describe a quality, as in distinguishing a "noble" building from a "profane" one. All these aspects, and more, are simultaneously present in the ambiguity of this one concept.

The many realms in which architecture operates and draws from add to the difficulty of grasping its fundamentals. Architecture seems to spread out in many different directions and it appears to overlap with even contradictory fields of study and aspects of everyday life. Architecture seems to be distributed "all over the place". We can, of course, focus on different aspects of architecture, for instance, by restricting attention to the differences and similarities between architecture and other arts, or by conducting technical research concerning new (or old!) construction products and methods, or by discussing the interaction between man and the built environment. All these activities shed light on some part of the whole, but they do not address architecture in its entirety. Architecture, in its entirety, is a challenging phenomenon to grasp.

[2]The Penguin English Dictionary, 2nd Edition, 2003.

Hämäläinen and Saarinen (2007b, p. 53) define the principal features of a system as follows:

- A system is characterized by the interconnections of its elements, as well as by the internal nature of those elements.
- A system has generative power. It produces effects beyond the modes and functionalities of its elements.
- A system has primacy over its elements while at the same time the elements influence the system.
- A system has emergent features, not reducible to the features of its elements.

Architecture, in each and every interpretation of the concept, is indeed characterized by the interconnections of its elements. Architecture could be conceived as a large system including a lot of sub-systems that each operate according to their own inherent laws. These laws can be exact and clear, like many of those in the field of physics. They can also be restricting, inexplicit, causal, implicit, statistic, probabilistic or whatever, but they do expose and conduct the way things happen in these systems and thus also have an effect on the whole.

Architecture also certainly produces effects beyond the modes and functionalities of its elements. Even in a small and simple building task many features come about besides those that are proposed in the beginning and those that are actually handled in the processes or subsystems of architecture. I have discussed some of these aspects in my previous chapter (Ojala 2007), where I examined architecture from the viewpoint of leadership.

In the perspective of the "primacy of the system over its elements" we actually touch a major problem in the field of architecture. When a subsystem of architecture takes the leading position, we may get results that are severely one-sided. Thus, overly focused economical efficiency can produce monotonous and depressing housing districts, while overly art focused architecture can produce spaces that are improper for their intended use, and so on. In architecture, and again in the many meanings of the concept, the primacy of the system over its elements is not only a feature, but a crucial precondition for its existence.

This is true likewise to the emergent elements in architecture. Every room must be more than the cubic meters it contains and the quality of the surfaces that surround it. Every home must be more than a set of rooms where to perform the necessary acts of dwelling. And if a building can be reduced to its elements, it is just engineering, not architecture. It may be necessary to point out, that I am not speaking of ornament here, although ornament may be an instrument to achieve what is wanted. What I am aiming at is a spirit or an atmosphere, something maybe undefinable in words, but intelligible to the people who visit or use these spaces.

It seems natural therefore to regard architecture from the systemic point of view. In fact, it may well be the only perspective through which some kind of general and holistic understanding is forthcoming concerning architecture. It will be an interesting task to survey the subsystems of architecture and their

interconnections and dimensions, but for the purposes of this chapter I will focus upon some key systemic aspects of architecture.

Operating Inside Systems

In systems research we find many tools to learn about systems and to operate with them. Systems thinking is a valuable asset when operating with complexity (Richardson 2004, Jackson 2006). A key feature of architecture is that it includes a number of different parties and stake holders with different kind of needs, hopes and aspirations (many of them implicit). In order to cope with the kind of complexity that emerges in architecture, it seems that we need a framework where we can operate without the misconception of "knowing it all" or "having total control".

Systems intelligence is a newly developed concept that has its roots in philosophy and mathematics, especially in systems theory. It was formulated in 2002 and introduced in 2004 by philosopher Esa Saarinen and mathematician Raimo P. Hämäläinen in "Systems Intelligence: Discovering a Hidden Competence in Human Action and Organisational Life".

Systems intelligence is neither an explicit theory nor a new type of paradigm. It is more like an umbrella concept which allows us to interpret familiar phenomena from a fresh and intuitively appealing perspective. It highlights a competence humans have used since very early times. The key idea is to focus upon "our systems endowment, the human systems intelligence we possess as human beings" which is "far more than ability to think about and know about systems" (Hämäläinen and Saarinen 2007b, p. 296). We live within and with respect to systems, we act and react in them, we emerge through systems – and systems intelligence is the ability to operate intelligently in the midst of such systems even in the absence of explicit knowledge of what the systems in question might be.

Thus the perspective of systems intelligence

> ... takes the pragmatic intelligence of us humans as its starting point, seeking to highlight what we do right even when we do not know exactly why it is right or know for sure if it will be right – all that in contexts of dramatic, perhaps humanly impenetrable complexity. Systems Intelligence approach, in other words, seeks to connect two distinct intellectual and life-orientational paradigms: the tradition of rationally controlling, engineering and commanding complex structures, and the tradition of sensing, experiencing and sharing the subtleties of one's environment through human connectivity and the subjective dimension. (Hämäläinen and Saarinen 2007a, p. 5).

Systems intelligence does not turn its back on objective realities, quite the contrary. In the work of say an entrepreneur, an architect, or a builder it is always vital to command as much relevant knowledge as possible, and especially not to dismiss any inconvenient truths. But systems intelligence also takes seriously the fact that no amount of information can ever yield perfect knowledge. And whatever may seem complete at the beginning of a process, will soon fade as change takes over.

Systems intelligence pays particular attention to human perspectives and sensibilities. People come to situations with feelings, intuitions, hopes, likes and dislikes, and all these are present and active in decision making, in interaction, in the forming of interpersonal systems. An external, object-based systems outlook may easily overlook such matters as irrelevant, and in the context of architecture may for instance focus on the objective dimensions of the building process. A more complete understanding of architecture cannot overlook the human dimensions, however; this is one of the reasons why the systems intelligence perspective is so useful in the context of architecture.

Systems intelligence approach has been applied to architecture in several chapters of systems intelligence books. The chapters have discussed the built environment from the viewpoint of a planner (Lahdenperä 2006), architecture and leadership (Ojala 2007), the concept of a home (Tervo 2007), the aesthetic interrelation between persons and their environment (Tallberg 2007), and the design of learning environments (Alho-Ylikoski 2008). In this chapter my aim is to extend the perspective further by opening a dialogue between the work of Christopher Alexander and the systems intelligence approach.

The Loss of a Relationship – and the Re-Creation of It

One central concept in Alexander's *Nature of Order* is Life. Alexander proposes that this property exists in some degree in every material object in our environment and that it is possible for each of us to recognize it.

The phenomena underlying Alexander's concept of Life-property and the concept of systems intelligence are both as original and basic as humanity itself. As mythical and religious stories of the origin of humanity tell us, in the very beginning of humanity people began to be aware of themselves, as part of and yet as separated from the "outer" world. They started to experience themselves as similar to, but still separated from the other beings that share this self-awareness. Research into the developmental stages of an infant show that something similar happens in the early months and years of the human life. In his groundbreaking book *The Child's Conception of the World* (1929/1972, p. 167), Jean Piaget writes:

> In fact, during the primitive stages, since the child is not yet conscious of his subjectivity, all reality appears to be of one unvaried type by reason of the confusion between the data of the external world and those of the internal. ... From the point of view of causality, all the universe is felt to be in communion with and obedient to the self. There is participation and magic. The desires and the commands of the self are felt to be absolute, since the subject's own point of view is regarded as the only one possible.

A baby thus expects her surrounding world to supply her everything she needs in a matter-of-fact and natural way. To her the environment is a living entity that she herself is a part of, and although she encounters different phenomena – varying light, floating faces, different kinds of sounds, changes in temperature and so on – they all belong to the seamless whole she herself is a part of. Only

gradually does she become aware of separate entities, some of which are hers – as in the miracle of a baby finding her fingers!

Even before the baby can separate herself from her surroundings, she acts and reacts, she adapts to and brings about incidents in her surroundings. She acts with inherent systems intelligence. It is a vital skill for a baby to be able to act intelligently with a system she knows almost nothing of. The baby is an active partner in what Daniel Stern has called "the interpersonal world of the infant" (Stern 1985), and with her systemic endowment she is to survive and get a chance to grow up and flourish.

To a very young child the environment is still a very living entity, even after she gradually grows to the awareness of her being separate from her environment. She associates feelings and personality to objects, she senses characteristics in her environment and she even feels that her emotions can have real effect in the material world. (For a description of the stages of the child's development according to Piaget, see Piaget 1929/1972. For some more recent discussions, see Stern 1985 and Hobson 2002). This magical relationship of immediate connectivity with the world is later lost. We might also get alienated from our environment and from other people as we learn life's "realities", gear towards an objectifying and materialistic world-view, and become distrustful of our bodies and our feelings. There are, however, even in our western – so called advanced – cultures some sensitive people, who keep something of this magical connectedness with the environment in them, even in adulthood. I am sure we find them for instance amongst artists.

I suggest that Alexander's concept of Life is about this living connectedness with our physical environment. Just as systems intelligence is a phenomenon and a capability that expresses itself in what Hämäläinen and Saarinen call "the human in-between", the emergence of Alexander-like Life-property is something that comes about in the interaction between human beings and their physical environments. It points to a capability and sensitivity that we possess to begin with, but which may languish, because there is so little in our modern lives to support, encourage or nourish it.

Around the world many cultures have been found which have lived in a closer connection with their environments than that which is usual in the western world. Not yet overpowered by our "civilization", many "primitive" cultures have preserved much more of the living connectedness with their material world. In his book *Language and Myth* Ernst Cassirer (1953) discusses many native cultures of both Americas, Australia, Africa, and Asia and quotes ethnologists that have gathered a vast data and numerous examples about a very different notion of man's place in the big picture of Nature and about the very different nature of this interaction.

Cassirer gives a compact and clear account of what he calls "the mana-taboo formula" of native people. Cassirer is tracing the phases of religious thought and the mana-taboo formula is regarded to be the "minimum definition of religion". According to it, there are places or persons that possess so much of the positive (mana) or the negative or dangerous (taboo) property which transcends all nature, that they can and must be separated from everyday life, and thus become "holy" or "cursed" (Cassirer 1953, pp. 62–73).

We are dealing here with a worldview where "how" matters as much as "what".

This pre-religious formula is thus preceded by the "notion of a universal, essentially undifferentiated Power", which is called with many different names in different parts of the world: "mana" by the Melanesians, "manitu" by the Algonquin (an Indian tribe of North America), "wacanda" by the Sioux (ibid.), "orenda" by the Iroquois (ibid.), "mulungu" by the Shambala people in South Africa, and many others (Cassirer 1953, pp. 64, 69). These concepts were usually interpreted to be parallel with the concept of the Christian God[3] (Christian missionaries were often the first people to study these cultures). Such a straightforward interpretation, however, passes the impersonal, indefinable and unclassifiable nature of the concept. Cassirer quotes Söderblom in his treatise:

> The words in question (mana, manitu, orenda, etc.) have ambivalent meaning and are variously translated as remarkable, very strong, very great, very old, strong in magic, wise in magic, supernatural, divine – or in a substantive sense as power, magic, sorcery, fortune, success, godhead, delight (Cassirer 1953, p. 66). Even the attempt to determine the wordclass to which these words would belong seems to encounter major difficulties – indeed, no English sentence of reasonable length can do justice to the idea of the words in question (Cassirer 1953, pp. 67, 69).

Clearly the idea behind these words is very similar to each other, no matter where or under what name this conception is found. We are dealing here with a certain type of mental attitudes; a worldview, where "how" matters at least as much as "what". The same attitude is found in many eastern religions and cultures. I propose that these old concepts comprise very much the same fundamental aspects as that which Alexander's Life-property is all about (Alexander himself makes indications towards this direction, if only in endnotes. See *The Phenomenon of Life*, pp. 62, 444). Alexander is thus focusing on an age-old phenomenon and bringing it to the present, as well as trying to define it explicitly and scientifically.

If we take the position that the understanding of the Life-property, the deep knowledge of our connectedness with everything else in nature, is a basic human quality, which we have to a great extent lost, we face two direct consequences. Firstly, we have at least a partial explanation for the overwhelming feeling of alienation that seems to corrode our modern cultures. Secondly, what we need is, not so much a new way of thinking, but rather to resuscitate an already existing one, which is only hiding.

Hämäläinen and Saarinen (2007b) state in their essay "The Way Forward with Systems Intelligence":

> Instrumental reason has created techniques and technologies that are superbly efficient in increasing productivity, efficiency and well-being

[3] See also Piaget 1929/1972, pp. 169–170.

> in separate segments of life. Taken together, they create a clear and present danger – a system of destruction – for living on planet earth.

The belief of man's power over nature may prove to be one of the most destructive ideas that mankind has ever fostered. Many innovations have furthered the well-being of mankind, or at least the well-being of some part of mankind. It also seems however, that every new accomplishment has come at a price; a price that is to be paid gradually and with potentially devastating effects in the long run, in a form that is hard or impossible to predict. Every action that mankind takes, which is not in harmony of with the life-supporting systems of nature, will backfire sooner or later.

James Lovelock's justly famed book *The Ages of Gaia* (2000) he gives a thorough account of the impact of humans on the systems of earth. As long as mankind possessed only a minor role in the big picture of nature, nature on earth could survive and eventually heal the traces of human activity. But with the means the mankind possesses now, the total balance of the planet is at stake. According to Lovelock, this is not likely to be fatal to planet earth, which will survive by adapting to the catastrophes that may follow, but it may well be fatal to many species living on this planet, including humans.

It is clearly high time that we learn anew the ways of living in harmony with nature and with ourselves. It is high time we started to appreciate "the life" in us and everywhere around us, and start to act more systems intelligently with the systems that sustain life. This does not mean that we should, or could, step back in time. We have to meet the demands of our time with the answers from our time. Taking this into consideration we must include in the processes of our time the understanding of our deep connectedness with nature, as well as our inherent need of meaningfulness and beauty. I find that this is the very core also in the teachings of Alexander.

We must revitalize our connectedness with nature as well as our need of meaningfulness and beauty.

Alexander vs. Systems Intelligence

The overlapping themes in Alexander's work and in the concept of systems intelligence are numerous and very central to both views. In fact, these concepts overlap so much, that I am almost tempted to see them as two sides of the same coin. Alexander is dealing with the interaction of human beings with their environment, including other human beings. Hämäläinen and Saarinen, are dealing with the interaction of human beings with other human beings, whilst also including the physical environment.

Both approaches believe in the inherent ability of humans to act intelligently in their surroundings and to shape their environment for the better, *with the wisdom, knowledge and sensibilities they already have in them.* This does not mean underestimating learning or acquiring skills, but it unambiguously denies the depreciation of people's tacit knowledge and sensibilities.

Both views are also concerned with what the prevailing systems actually generate – and press the question as to what extent what we get is what we really want. "It's not what the vision is, but what the vision does" (Hämäläinen and Saarinen 2007, p. 21). And just as systems intelligence has at its core "this call towards flourishment" and the wish to "elevate our everyday actions in the right direction" (ibid., p. 16), so does Alexander's work strive for the same goals.

Both Alexander and systems intelligence believe in the inherent ability of humans to act intelligently in their surroundings and to shape their environment for the better, with the wisdom, knowledge and sensibilities they already have.

Systems intelligence is about tuning into the realm of human details, taking them seriously and building a connection to bigger entireties in a way that is functionally relevant. I find this a very good phrase to describe the central content of Alexander's approach as well. Both views aim, likewise, to getting people fully connected with their inner potentialities and energies.

Both approaches also share a particular way in combining what seem like contradicting goals. Alongside with "developing a system of focus" there is also a demand of developing "a system of staying open" (Hämäläinen and Saarinen 2007, p. 22): it is essential to pay attention to what is emerging. Sensitivity, holism, and constant adaptation to the constantly changing situation are key features in both approaches.

There are important differences, too. One of these has to do with the time factor. As I stated in my previous chapter, architecture is a profoundly slow art. Time is an essential factor in every phase of architecture. (Ojala 2007, p. 137). Where systems intelligence demands instant mental agility and quick reactions, Alexander's way of interacting with the environment is more gradual and slow. It calls for profound consideration, continual experimentation, and going deep into the qualities of the place. Just as the changes in nature are gradual and evolving, so should the changes be in our environment. Rapid and extensive changes are, as well in nature as in our built environment, most likely to be catastrophes.

Another basic difference is the degree of inherent openness in the approaches themselves. Alexander sees the need for constant flexibility in the unfolding of the environment and of any one building. In his theory, however, he strives to form a solid and all-embracing structural discourse that somehow would include *all* the things that matter. This tendency towards One Ultimate Truth may reflect his personal history as a mathematician. In this perspective Alexander's theory seems to belong to the objectivistic paradigm unlike systems intelligence, which chooses to stay open even in its own definition.

In the same way there is a significant difference in the degree of commitment that is demanded. As Stenros (1990) observes in her essay "Making a building which is like a life lived", the application of Alexander's (earlier) theories tends to demand the acceptance of the whole system, and thus the results can only be evaluated inside this system. Although Alexander has developed and widened his approach, I feel the same undercurrent is still there.

With systems intelligence, however, it is perfectly legitimate to use the approach in a piecemeal way. It is not even crucial to know why something works. If something works in practice, it can be taken as a starting point to bring about more of the good to the world. There is considerable trust in systems intelligence in small, incremental and even accidental interventions.

Tools for Architects

For an architect both approaches can offer some practical and powerful tools. Alexander's theory seems to perform at its best when used to analyze the built environment, and likewise in the completing or healing of an unsatisfactory or lacking built environment. It has also generated very convincing results in the field of building one-family houses.

Despite this, in the creation of wholly new areas serious problems can be seen to be raised both in the handling of larger entities and in the execution of individual buildings. Large projects include so many participating agents, and the commitment of all of them can hardly be as total as the application of Alexander's theory would demand. In a one-family house project people are more likely to be very committed and willing to put extra hours and/or money in the building of their dreams.

Handling the unfolding of a larger entity also seems to need a "master mind" to tie up all the different aspirations, in order to produce a fully functional and satisfactory architecture. No architectural system, however complete it strives to be, can rise above its constituent parts in the absence of an extra input that "breathes the spirit" into the whole. Maybe Alexander's point is that the "master mind" should emerge from the individual minds working with due sensibility to the demands of the "pattern language". But one is left wondering, how such a process could actually evolve in the presence of a number of stakeholders and parties with non-identical interests.

Systems intelligence, of course, does not directly offer any tools for the actual practice of architecture. It does, however, work very well in e.g. analyzing the subsystems of architecture, both in theoretical and practical aspects. It is also a fruitful perspective in studying the interaction between people and their environment on many levels, as previously mentioned. The most powerful contribution of Systems intelligence to the field of architecture could still be in its lessons about human interaction.

Architects work with other people at every stage of design, planning, and construction, but today it often seems that architects lack the capability to communicate genuinely with the other parties. The vocabularies of architects, clients, constructors, officials, and users seem to differ considerably, causing constant problems. Systems intelligence could help to develop better practices for the co-operation of the participants, to ensure that the "flourishment potential" of architecture is not lost in misunderstandings.

Conclusion

In much of the everyday building practice today, the demands of art and nature and even those of basic humanity are often overpowered by the interests of technology and the economy of efficiency. To be able to turn the processes towards healthier and more holistically life-enhancing directions, we need more knowledge about the human connectedness with nature, and about the preconditions of our human well-being. The approach of Christopher Alexander and that of systems intelligence can both point us in critical directions, and inspire relevant research.

To be able to get real functionality out of the theories of architecture, we also need to bring these studies to bear on the actual practice of architecture. This has been Alexander's life-long mission, and it certainly has been a grand and glorious one.

Systems intelligence provides us with one platform to conceptualize the task. It offers us new perspectives, and new tools. With its emphasis on sensibilities beyond those of objective knowledge, systems intelligence, like Alexander, seeks to create more room for humanity in the world of architectural systems.

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