# Notes on the Synth

by Ricardo L. Castro

## I An Environmental Conflict

I am looking out of the window now... I see trees, and I think of the one that provided shade in my backyard. It was young and robust. A red maple getting ready to change colors and shed its leaves. Through its branches the winter light would have shone into my bedroom. It was, like the other trees in the city, an extraordinary environmental system. The kind that designers have been conceiving with some success and lots of failures for thousands of years. The tree is not there anymore. My next door neighbor cut it down yesterday. I have no doubt that he meant well. He had a great smile when he told me about it, although I did not think it was the 'smile of reason'. His action seems to have been justified. What more than the ancestral building drive which will soon be materialized in a brand new addition to his recently renovated basement; the archetypal match-box with diagonal siding à la Californien. He had all the legal rights of wrong/doing: the red maple was just a few inches within his property. Mind you, he is a nice fellow. We greet each other every day.

I look out of the window again and I see more trees. I think... no leaves to rake this fall. I realize that my neighbor and I do not share the same understandings about the ways in which we could effect changes in the environment. Our immediate environment, that is. The one that includes the alleys, the backyards, the rooms, the porches, the entrances, the street, the neighborhood playground, the park, the corner grocery store... the city in which we live. I also realize that the conflict just presented — a true story — could have had a happier ending had my neighbor been aware of some simple design concepts like the following.

## II A Design Concept

"Buildings must always be built of those parts of the land which are in the worst condition, not the best."

This idea is indeed very simple. But it is the exact opposite of what usually happens: and it takes enormous will power to follow it through.

What usually happens when someone thinks of building on a piece of land? He looks for the best site — where the grass is most beautiful, the trees most healthy, the slope of the land most even, the view most lovely, the soil most fertile — and that is just where he decides

to put his house. The same thing happens whether the piece of land is large or small... It is only human nature; and, for a person who lacks a total view of the ecology of the land, it seems the most obvious and sensible thing to do.

When we build on the best parts of the land, those beauties which are there already... get lost in the shuffle.

People always say to themselves, well, of course, we can always start another garden, build another trellis, put in another gravel path, put new crocuses in the lawn... **But it just is not so.** These simple things take years to grow — it isn't all that easy to create them, just by wanting to. And every time we disturb one of these precious details, it may take twenty years, a lifetime even, before some comparable details grow again from our small daily acts.

The idea of site repair is just a beginning. It deals with the problem of how to minimize damage. But the most talented of traditional builders have always been able to use built form, not only to avoid damage, but also to improve the natural landscape. This attitude is so profoundly different from our current view of buildings, that concepts which will help us decide how to place buildings to **improve** the landscape don't even exist yet.

**Therefore: On no account place buildings in the places which are most beautiful. In fact, do the opposite. Consider the site and its buildings as a single living ecosystem. Leave those areas that are the most precious, beautiful, comfortable, and healthy as they are, and build new structures in those parts of the site which are least pleasant now.**[1]

## III Patterns

The Environmental conflict illustrated in the story of the tree and its possible solution offered by the design idea of "Site Repair" represent, in a nutshell, the concept of a "pattern". In this light, it is possible to equate the idea of pattern with a rule; a three-part rule which states an environmental conflict, establishes the range of contexts where the conflict occurs, and gives instructions for its solution. Moreover, a design or planning pattern is a whole entity that forms part of a larger network of instructions known as *A Pattern Language*. Christopher Alexander conceived this design and planning language in the early 1960s. He and others have been developing, refining,

and implementing it ever since[2].

The language, published in a book with the same title, includes 253 patterns like "Site Repair". All of them are identical in structure and all are hierarchically organized and related according to scale and context, thus forming, three different groups. The first one consists of "Global" patterns (Patterns 1 to 94) which serve as general frames of reference for the development of towns and cities. The second group is composed of the patterns which define buildings and the spaces between buildings (Patterns 95 to 204). The pattern "Site Repair" belongs to this category. Finally, the third group includes all the "construction" patterns which provide instructions on how to build in detail (Patterns 205 to 253). Because of their general nature, only the patterns in the first group cannot be built or designed[3].

"A Pattern Language" is a design vehicle now available to all of those who are involved in environmental changes and interventions, whether specialist or non-specialist individuals, teams or user groups. For these designers the language provides an excellent framework for design inquiries. It is also a diagnostic tool that permits a selective, but comprehensive, apprehension and development of understandings about how environmental change can be effected.

## IV Design and Epistemology

Architecture can be considered as the formal externalization of understandings, hence the notion of a 'conceptual framework' behind every building and every building act. Conversely, "the process of design is essentially the process of gaining understanding", of gaining knowledge[4]. In this light design inquiries, attitudes and theories become relevant themes for epistemological study[5].

The study of architectural epistemology provides a clear picture of the evolution of past and present design thought. Moreover, it allows to make an incisive inquiry into the architectural situation of a given epoch; one that is free from

the straitjacket of stylistic labelling and pigeon-holing — as it is the case in most of today's architectural discussions. It should provide also some answers as to the possible avenues and prospects for the design activity. From this perspective, the study of Alexander's work clarifies what his contribution has been to the development of current architectural thought and practice. It may, finally provide some insights about the relevance of his work in actual and historical terms.

## V Reason and Experience

Contemporary design thought and practice have been fundamentally influenced by two epistemologies: Rationalism and Empiricism[6]. Both developed in the seventeenth and eighteenth centuries within the emerging context of experimental science as an attempt to explain how scientific knowledge was attained. Empiricism and Rationalism are of the same coin; one opposite to the other, but both part of the same whole. Generally speaking the empiricist view maintains that the only legitimate starting point for knowledge is the human sensory system. Thus, human experience (the experiment) happens first, and knowledge is distilled, **induced** from it. The rationalist view, on the other hand, emphasizes the power of reason (*Ratio* in Latin) for the development of knowledge. The rationalist scientist maintains that it is possible,

by pure unaided reason, first, to conceive and comprehend certain general features of the universe, and then, from these conceptions, to **deduce** mathematically a description of what the actual empirical world is, prior to any experiment.

Both of these epistemologies become an integral support for the development of Christopher Alexander's ideas and theories of design, a fact that sets him apart from other contemporary approaches which seem to rely on only one of the two epistemologies[7].

## VI Alexander's Synthesis

Alexander's initial ideas of **patterns** fell specifically within the boundaries of Rationalism. This becomes evident when studying the *Notes on the Synthesis of Form* which encompasses the outcome of his research into the processes that lead to the creation of form[8]. The *Notes* were published in 1964, and in them Alexander presents some very useful concepts such as the notion of 'fit' between form and context, and an excellent discussion of how design processes take place both in the unselfconscious and the self-conscious cultures. For this task he utilized a very systematic approach based, among other things, on graph and set theories. This, of course, brought him forward as one of the pioneers of Design Methods and as one of the leading exponents of rationalist thought in design[9]. He has, however, disavowed these labels rejecting at the same time the idea of design methods[10]. Of all the ideas enunciated in the book he has kept the seminal concept of 'diagrams' which is derived from d'Arcy Thompsons's remark that a 'form' is a diagram of forces[11]. He points out in a later preface to the paperback edition of the *Notes:*

> Today, almost ten years after I wrote this book, one idea stands out clearly for me as the most important in the book: **the idea of diagrams.**
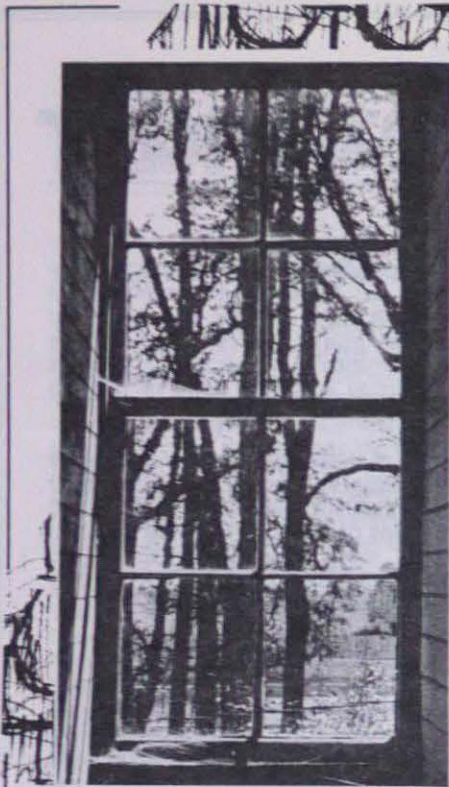> Those diagrams, which, in my more recent work, I have been calling **patterns**, are the key to the process of creating form[12].

He adds later on:

> At the time I wrote this book, I was very much concerned with the formal definition of 'independence', and the idea of using a mathematical method to discover systems of forces which are in-
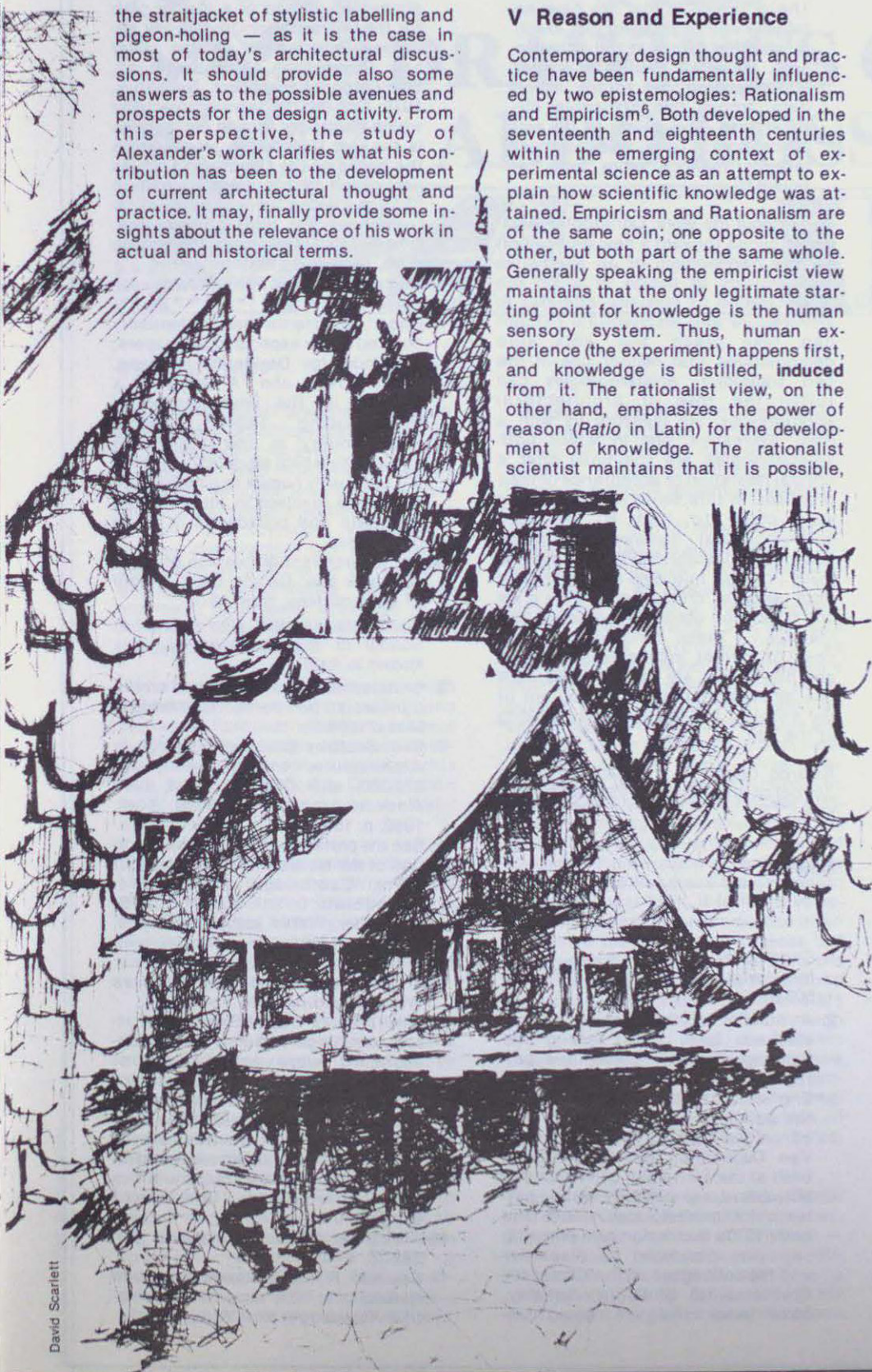
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dependent. **But once when the book was written, I discovered that it is quite necessary to use such a complicated and formal way of getting at the independent diagrams**[13].

Continuing his critical discussion of the *Notes*, Alexander then announces, what I consider, a shift to an empiricist attitude; and he finally concludes:

> If you understand the need to create independent diagrams, which resolve, or solve, systems of interacting human forces, you will find that you can create, and develop, these diagrams piecemeal, one at a time, in the most natural way, **out of your experience** *(emphasis mine)* of building and design, simply by thinking about the forces which occur there and the conflicts between these forces[14].

His work from here on will be impregnated by the marriage of two different perspectives. Rationalism will provide the conceptual framework for the development of the pattern language, and its related theory. Empiricism will allow the experiential approach for the development of each pattern, each element of the larger system. It is precisely in *The Timeless Way of Building*[15], the book that describes the philosophy behind the pattern language, that Alexander stresses the empirical qualities of the patterns:

> ...a pattern is alive if its individual statements are empirically true... A pattern only works, fully, when it deals with all the forces that are acutally present in the situation...

The difficulty is that we have no reliable way of knowing just exactly what the forces in the situation are... What we need is a way of understanding the forces which cuts through this intellectual difficulty and goes closer to the empirical core... To do this, we must rely on feelings more than intellect[16].

Throughout his work, Christopher Alexander brings forward a new proposition for the development of an alternative epistemology of design in which the reconciliation of opposite attitudes in architecture and architectural thought can take place. His work also demonstrates that neither one of the two traditional epistemologies can fulfill the role of architectural epistemology. He presents us with a third alternative, one in which both epistemologies are combined after a critical refutation or acceptance of their premises. In this sense Alexander gets very close to Karl R. Popper's epistemological framework in which knowledge (design) results from a will to learn from our mistakes and ultimately from taking a "critical" stance *vis à vis* one's own, or others' hypotheses and theories.[17]. These conditions, in the case of current architectural practice and discussion, are badly needed, as it can be corroborated by looking out of the window... beyond the trees... looking at the city.

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**Notes**

1. Christopher Alexander et al., *A Pattern Language*, New York, 1977, pp. 508-51.
2. A number of institutions and individuals have been testing the language and developing new patterns. The U.S. Army Corps of Engineers has developed guides for the design of childcare centers based on the pattern language. Harry Van Oudenallen and Gary Moore, both at the University of Wisconsin-Milwaukee, are currently testing patterns for marketplaces. Since the early 1970s the design and planning principles developed by Alexander and his colleagues at the Center for Environmental Structure, Berkeley, have been and are being implemented as part of a master plan for the University of Oregon. For additional information on the latter see: Christopher Alexander et al., *The Oregon Experiment*, New York, 1975. One of the latest projects in which Alexander applied his theories is the Linz Cafe which was built on the banks of the Danube in Linz, as part of the 1980 summer exposition "Forum Design". For additional information on this project see: Christopher Alexander, *The Linz Cafe*, New York, 1981.
3. Alexander et al., *A Pattern...*, pp. xviii-xxxiv.
4. Robert S. Harris has extensively covered these aspects in two papers: "A Model for Designers", Eugene, Oregon, 1975, and "A Design is a Spin-off in the Development of Understanding", Eugene, Oregon,
5. Epistemology is the branch of philosophy which studies things having to do with human knowledge, the processes involved in knowing and the limits and boundaries of these processes.
6. For an excellent discussion of these concepts see: George Gale, *Theory of Science*, New York, 1979.
7. For instance the Neo-rationalist School or the Tendenza as it is known in Italy.
8. Christopher Alexander, *Notes on the Synthesis of Form*, Cambridge, Mass. 1964.
9. See: Geoffrey Broadbent, *Design in Architecture*, London, 1973, pp. 272-280, and Charles Jenks, *Late Modern Architecture*, New York, 1980, p. 184.
10. See the preface to the paperback edition of the *Notes on the Synthesis of Form*, Cambridge, Mass. 1974.
11. Broadbent. p. 275.
12. Alexander, *Notes* (paperback), p. i.
13. Alexander, *Notes* (paperback), p. i.
14. Alexander, *Notes* (paperback), p. ii.
15. Christopher Alexander, *The Timeless Way of Building*, New York, 1979. *The Timeless Way of Building, A Pattern Language* and *The Oregon Experiment* were written almost simultaneously. The books were not published in the intended sequential order. This has created some controversies. By 1974, the three books, in manuscript form, circulated among students and faculty in the School of Architecture, University of Oregon.
16. Alexander, *The Timeless...*, pp. 282-86.
17. See Karl. R Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*, New York, 1968.