CHRISTOPHER ALEXANDER AT BERKELEY
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IN 1963 WHEN CHRISTOPHER ALEXANDER JOINED THE FACULTY, the modernist/ technological paradigm that had been shaping the framework of everyday life for several decades was starting to be seriously questioned. Jane Jacobs' *The Death and Life of Great American Cities*[1] appeared in 1961, Rachel Carson's *Silent Spring*[2] in 1962. The year after Chris arrived, Mario Savio led the Free Speech Movement from the steps of Sproul Hall. Wurster Hall itself, the fruit of a vision of an integrated approach to the design of the built environment, was just opening its doors. During the 1960s and early 1970s the Department of Architecture saw itself in the forefront of social change, and hired a number of people who shared with Chris the view that the relationship between architecture and people needed to be fundamentally re-thought.

> In the years before I came to Berkeley, from 1958 to 1963, when I was at Harvard (doing a PhD) I felt bewildered and sickened by most of 20th century architecture, and set out to redefine it. When I arrived, intellectual freedom was encouraged by the department, and I was able to work in ways that were new and fundamental.[3]

The work Chris did over 35 years resulted in fundamental changes to architectural thought as it had developed over the previous two centuries. The separation of fact from value; the idea that aesthetics is ultimately a personal matter, and that there is no objective basis for making aesthetic decisions; the distancing of the architect from both the people who use buildings and the builders who make them—all of these assumptions, so firmly entrenched that they became invisible and taken for granted—had their foundations shaken by Chris's work. These changes to the most fundamental philosophical assumptions that influence architecture were manifested in dozens of specific contributions.

Chris and his colleagues made fundamental innovations in the way architectural function is conceived and the way user input works. They developed the use of patterns as the way a culture remembers and re-uses experience, the use of pattern languages as creative instruments in planning and design, and how lay people can become powerful as designers and builders by using pre-existing pattern languages. They developed new ways for houses and groups of houses to be conceived, and how projects are shaped by their culture, and modified to anchor buildings in human feeling and human spirit.

Chris innovated with concrete technique, with the use of finite element analysis to integrate structure with design, with the analysis of budgets to fundamentally contribute to design, and with the way that construction contracts are written to allow ongoing change. New techniques were developed for neighborhood planning with the use of diagnosis performed on the land and in urban districts, for the distribution of money for construction projects in the city, in the development of neighborhoods and housing

districts at high density in which users had control, and in the development of settlements based on local patterns in Third World countries.

The innovations included a new understanding of the role of wholeness as the fundamental tool in design; the idea that every whole itself is made of centers, and the concept of centers as the fundamental building blocks of living structure; a new formulation of the theory of color that arises in painting; the idea that every step in the production of something that is whole is a structure-preserving step; the empirical methods that are needed to bring questions of objective value into play in architecture; and consequently, the foundation of a way in which experience about buildings can be shared.

These innovations evolved in response to ongoing work. In 1963 one could not have predicted the emphasis on building construction that emerged in the 1970s nor the following emphasis on formal order that emerged in the 1980s. All these innovations were undertaken by Chris and his co-workers, many of them working initially as students. He never saw teaching as a process of imparting extant knowledge to a passive student. He saw it as a way of discovering things, making innovations in the field of architecture, collaboratively with students. His life as a teacher was inseparable from his life as a creative artist and innovator.

Chris's intellectual background was, in part, the English empirical tradition—he studied at Oundle, an important secondary school for training in mathematics and science, and then at Trinity College, Cambridge. He insisted on precise observation and had a lack of fear in seeing its consequences. It was the consequences of this way of working that contributed to what became a severe and ultimately unbridgeable rift between Chris and other members of the faculty.

> I felt that I was like a person wearing very slippery boots on a skating rink. What could I say (about the problem, for example, of designing 100 houses) that was unquestionably true? I didn't want to say anything that was fantasy; I wasn't certain about big things, only little things. Starting in 1963, my focus was always a very, very detailed analysis of what was happening in a building, to make that building well. I was influenced by the anthropologist, Malinowski, and also by Virginia Woolf, with her minute attention to smaller things and how they built up to form reality.

When he joined the faculty, Chris began a sustained program of research and experimentation in architecture and building that was to last until his retirement 35 years later. The result was a dozen ground-breaking books and some hundred built projects. Many people who studied with Chris went on to influential professional and academic positions, and the effort helped to bring attention from afar to the Berkeley's Department of Architecture.

In 1967 Chris founded the Center for Environmental Structure (CES), a non-profit organization to undertake fundamental research and experimental projects in design and construction. Although CES was legally separate from the University of California, Berkeley, there was a close working relationship between the two. Many people who worked at CES were initially students. Many of them, in fact, had come to Berkeley from different countries specifically to work with Chris. Studios and seminars that Chris taught were almost always centered around ongoing CES projects, often in their formative stages. They also included basic investigations into questions of order, color, city planning, and user participation in design.

> In my over 30 years at Berkeley, I taught perhaps 200 courses. Of those, perhaps only 10 were done only "to teach;" I always saw courses as an opportunity to develop new ideas and new knowledge, and felt that it was patronizing to students not to do so. I was expecting students to produce results that were helpful to the discipline, and did not accept anything less. If the thing is real, the professor is on the hook as well, and the student sees the professor in action at the height of his game.

The development of new knowledge began with the first seminars Chris taught, which were by all accounts intellectually exciting and important to the development of Chris's work. It was in these seminars that some of the initial ideas of the pattern language were developed, and that some of the first patterns were written.

When I entered the graduate Option 3 program in 1971, Chris had been on the faculty for eight years. His group was well along toward the completion of the pattern language, and had carried out some important projects toward that end, including an international competition for low-cost housing in Peru. I studied with Chris in my last year, in a two-term studio that involved the development of a new planning process for the city of Berkeley, in which local neighborhoods would have the responsibility, authority, and resources to make decisions about their own development and improvement. The studio entailed theoretical work, design simulations, the development of a new ordinance, and actual construction projects which took place on Berkeley streets.

At the same time this project was happening at the neighborhood/city scale, an experimental building was under construction by another of Chris's classes, which included Don Corner and Walter Wendler. This building was a test of a construction system which allowed design decision-making to happen throughout construction, foreshadowing projects and establishing a theoretical position which attempted to base design on real, on-the-ground things, rather than abstraction. These projects were at two extremes—city planning and building construction—and as such were typical of the breadth of concerns that defined Chris's work, reflecting his conjecture that there are equivalent processes at work in the creation of healthy environments at all scales.

Chris was beginning to define a position that was quite different from that of other people on the faculty, even as everyone insisted that their goals were similar—the development of a human-based architecture. One beginning of the parting-of-the-ways had to do with the idea of *process*—of a challenge not only to the forms of contemporary architecture, but also to the way it was made. He challenged the role of the architect, the relationship between the architect and the builder, the money-centered system of production. These challenges were hard for some professionals on the faculty to accept.

I remember a public lecture Chris gave in 1974 titled "The Growth of Order from Small Acts." Room 155 Dwinelle Hall was full. In the lecture Chris talked about the idea that order—particularly the overall order of an entire city—might emerge from "below," from people themselves, rather than through the medium of a master plan from "above" if the rules of growth were clear and commonly understood. He made analogies to such things as crystal formation and the genetic code, and talked about historic towns and cities which had grown organically guided by common understandings. He also showed examples of recent projects—notably the University of Oregon's master planning process which had been completed a couple of years before, and the Berkeley planning process which I was then working on—to illustrate the practical application of these theoretical ideas.

At the very end of the lecture Chris exhorted the students to rebellion, to refuse to do large urban design-master planning projects that might be assigned by their studio instructors. The students cheered—the intellectual point had been clearly made, and it was being directly connected to their professional lives. But one or two senior faculty members, modernist form-givers to the core, left the room visibly angry, red in the face. It seemed to me that the growing rift in the faculty, of which I'd already had some subtle hints, was clear.

During the second half of the 1970s and into the 1980s, Chris continued to question fundamental assumptions, not only about architectural content, but also about how professionals were to work. These assumptions included the separation between architects and builders, which had been part of practice for (only) a hundred years, but which was one of those things that architects were simply not supposed to question.

This led to all sorts of projects in which architecture students actually built things. At various times one of the work yards outside the sculpture studios was used for construction experiments. A piece of University-owned land up Strawberry Canyon was used,

the Richmond Field Station was used, part of the eighth-floor studio was used. The CES bought land in Martinez, about a 45-minute drive from Wurster Hall, and that became the site of experimental building projects for about 10 years. Students worked on houses that Chris (who had obtained a California contractor's license) was building. Other construction experiments included work for a school in Japan, a homeless shelter in San Jose, a market in Fresno, and many others. Ceramic tiles were fired, timber joints were shaped; inexpensive techniques for making terrazzo floors were invented; computer techniques were introduced to analyze indeterminate structural systems. There was always excitement in the combination of theoretical ideas and practical, hands-on work.

Many experiments were attempting to make use of the plasticity of concrete to allow for freedom in precise setting of dimensions and shaping details, and to allow for implementation of a theory, which required such precision of form. In some cases these experiments represented full-size building details; in others, very large- scale models of buildings were built to allow for accurate visualization of finished buildings. In all cases the intention was to put the designer as close to the reality of the finished building as possible, with the idea that such proximity would permit more accurate, real decisions. These experiments were tangible evidence of a serious challenge to the status quo. Chris explains:

> With the construction experiments, the questions included the extent to which one can allow decision making to interpenetrate the normal sequence of construction activity. From a technical point of view, our experiments were sometimes peculiar and amateurish. But from a procedural point of view, each step of construction created the context for the next step, to allow for (a natural) unfolding to occur. This question was enormously sophisticated and even now has not yet been fully solved for large buildings.

Artemis Anninou, who is now an architect in Athens, writes about one of the things she learned as Chris's student:

> A good architect, who respects what is given to him for further development, has to make sure that every step of design is primarily a concrete act on the site and not lines on a paper. And in addition the design process is a set of step-by-step acts, which starts with the big stuff that connects harmoniously the new building with what is already there, makes sure that this is properly resolved and designed in all its major aspects—size and shape of land, slope, trees, sun, winds, views, existing streets and paths, neighboring buildings, and so on. When this is well done, it will provide a stable and successful framework for all following design acts that will ensure the design of a building respectful of its environment....[4]

The fact that theory and practice were always informing each other inevitably made the work difficult, but it also pointed toward the possibility of genuine progress.

Hajo Neis, who was a student of Alexander's and later a faculty and professional colleague, said:

> I was very involved in the student movement in Germany during the 1960s. In that movement we were dealing with problems in a theoretical way, through critical analysis; there was little sense of how to actually institute positive change. Chris continued that in real ways. He was dealing with the same issues we were dealing with in the student movement. In very practical ways, he talked about involving users, and about how to use technology so that it did not dominate human beings. He used the same Marxist terms like "means of production," but we had never thought about taking it into our own hands. Chris's work covered a big body of architectural design and architectural production; things were being done consistently, and nothing was taken for granted.[5]

In the 1974-75 academic year Chris brought a group of students to Mexico to help with a housing project that was set up to test new ideas about building production. In this

project construction techniques, financing systems, and professional roles were being redefined to allow the order of buildings to emerge continuously, based on their own reality on the ground, and thereby allowing users to take maximum control of the creation of their own environments. During this year Chris was also running a formative seminar at Berkeley that continued the idea that at root, similar processes were at work in the creation of healthy cities, buildings, rooms, and furniture. This was the beginning of an altogether new theoretical venture, one which went beyond the functionalism of the pattern language approach, to deal with the basic structure of ordered space.

David Week, who was one of the students in that seminar, and who is now a practicing architect in Australia, writes:

> Chris set up the class by saying that there was a limit to the pattern language approach. Users using the pattern language tended to make very complex, contorted, hippie-like structures. Most traditional buildings, on the other hand, were very simple—big simple windows, repetitive arcades, and the like.
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> He'd come to the conclusion that there were about 10 geometric properties at work. What was interesting about these, was that they seemed to underlie the patterns. Also, that they appeared to be very strongly present in (buildings like) the Great Mosque at Kairouan, Chartres, and Ise…, in nature, and in the Turkish prayer rugs which Chris collects.
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> Some of the things we did to explore the properties: visit Chris's house and study the rugs; draw purely "ornamental" buildings—plans, elevations—without regard to function; and most memorably, doing weekly paintings in gouache, again without purpose or subject matter, other than to explore the geometry and colour. [6]

With this new work Chris challenged the most commonly held assumptions in contemporary architecture, namely that order and value are purely matters of personal choice, not to be questioned or even discussed. The idea that the life of a place can be objectively measured, and correlated with the nature of geometric order it is made of, is perhaps the most startling and disturbing hypothesis. Certainly since postmodern ideas had begun to take hold, the world of architecture had moved far away from the ability to accept anything so precise. This challenge, along with its implications for the way buildings are built, helped to widen the rift between Chris and other members of the faculty, which became quite strong by the end of the 1980s. But at the same time this new work was coming to fruit in the 1980s with several major projects, including the Eishin School outside Tokyo, involving a complex of 30 buildings, and the first drafts of what became a four-volume work, *The Nature of Order.*[7]

Three faculty members, particularly, who were also collaborators on many professional projects, joined Chris in his efforts in the department. Ingrid King taught many excellent design studios. Sara Ishikawa, who joined the ladder-rank faculty in 1974, taught courses concerning patterns of various world cultures. She describes her approach:

> I always had a good diversity of students—from the Middle East, from Asia, from Europe. These courses provided a basis for students to look at their own cultures, and the students were grateful for the methodology. The pattern language is extremely useful for this—to be able to break things down and really get into issues—really detailed issues like how the entrance to the house worked, or how cooking takes place, or issues regarding community. We looked at buildings both from the problem side and the solution side. The course had a simple structure and it worked: students first researched climate, geography, history and existing housing; they then picked an actual site, and formulated patterns for that site; and finally designed housing on the site. I learned a lot about different cultures through these courses.[8]

Hajo Neis, with his own specialties of urban design and building design and production, became a central player, along with Chris, in the building process area of the curriculum in the early 1990s. This permitted students to engage in an organized set of courses that dealt with a full range of scales of the environment, and theoretical as well as practical issues. The building process area was a logical continuation of previous work, and was attempting to bring ideas about process—construction techniques, client/builder relationships, methods of planning—into focus as a serious academic concern. Neis explains:

> At the beginning there were lots of students and there was a great atmosphere; it was a good area to work and study in. The area was similar to the Bauhaus in its structure, although it of course had different content and philosophy. But it began with small projects, worked up in scale, and always had real projects and the actual making of things at its center.[9]

Over the years Chris's work always had two sorts of relationships to ongoing movements in architecture and the design disciplines. On one hand, the work seemed to give fundamental answers to problems that many people were expressing. But on the other, the answers were so fundamental that they went much deeper than the problem initially seemed to require to the point that they challenged people's fundamental world views.

The content of the pattern language, for instance, emerged quite straightforwardly from the social concerns and critiques of modernism in the 1960s. If it had been developed solely as a tool for architects, it might not have sparked as much controversy as it did. But during its development, it became a means through which ordinary people could themselves take responsibility for the design of the environment. Although it was strongly connected to progressive politics, this idea did not go over well with architects. And Chris's later work about form and value only seemed to add fuel to the fire. Indeed, many architects found it difficult to accept what would turn out to be a double challenge to their authority.

But with all of the conjectures Chris put forward—about the structure of the environment, about how the environment is produced, about the depth of human feeling that might be connected with it—he was never motivated or influenced by what was acceptable to other architects. He is an architect and builder and artist with superb sensibilities about form and color; but at the same time he has always remained a scientist, unwilling to be swayed by what is or is not acceptable.

Chris once told about his scholarship entry examination to Cambridge, when he was put in front of an experimental apparatus and asked to measure the earth's magnetic field at that place. He knew what answer to expect, but could not get the experiment to work. So he was faced with a dilemma on which hung his scholarship to the University: to present the "right" answer or what seemed to be a faulty experiment. He chose the latter—and it turned out that the examiners knew that a large electromagnet in the basement of the building was causing the apparatus to be thrown "off." He was awarded the top scholarship to Trinity College, Cambridge.

> In science ignorance is the thing that is the most cherished; the scientist wants to use ignorance to make discoveries, and this is fruitful if you are open-minded about your own ignorance. But for many architects, the professional stance is to be afraid of ignorance and to demonstrate a mastery, which is too often false. I have a passion about ignorance. I shared my ignorance, tried to bring out (the students'), as a point of value that made it possible to discover things that were scary to many people.

Indeed, what always appealed to me about Chris is just this fearlessness, and his willingness to go as far out as he does on an intellectual limb. What I tell my own students at Oregon is that architecture is *important*, as important as medicine to the human condition, and not the icing on the cake of something else. If that's true, then the task of architects and architectural thinkers is one to be approached with the same seriousness as medical researchers or scientists. Only time will tell where the field of architecture will be 50 years

from now, but there is little doubt in my mind that the changes Chris has made will turn out to be central to the debate.

Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).

[2] Rachel Carson, *Silent Spring* (New York: Fawcett Crest, 1962).

[3] This and successive quotations of Christopher Alexander are from an interview with the author January 20-21, 2002.

[4] E-mail correspondence with the author May 17, 2002.

[5] This and successive quotations of Neis are from an interview with the author February 25, 2002.

[6] E-mail correspondence with the author January 15, 2002.

[7] Christopher Alexander, *The Nature of Order* (Berkeley: Center for Environmental Structure, 2002).

[8] Interview with the author February 27, 2002.

[9] Interview with the author, 2002.

DESIGN ON THE EDGE

A Century of Teaching Architecture at the University of California, Berkeley, 1903-2003