ARRIVING AT KNOWLEDGE:
A FUNDAMENTAL CHANGE IN ARCHITECTURAL EDUCATION

Transcript of the speech by Professor Christopher Alexander with minor modifications and editing for readability.

Painful Transformations

This is a painful day for me.

For years I have loved Turkey from afar, because of my deep respect for the great 13th, 14th and 15th century carpets I have studied for years. I know the name of half the towns and villages, just because I know the origins of carpets. But I have never been to Turkey before. This is my first time. I feel, too, a very warm kind of affectionate feeling for all of you that have been speaking and for all the effort you are making to struggle with the problem of architectural education. All that is a very pleasant thing.

And so you might wonder why I'm feeling that what I have to say will be so painful, or why I'm feeling this speech is so difficult . . . It is difficult because it is a painful thing that I am going to say to you, painful because it affects all of architecture, all of teaching about architecture – and it therefore affects the lives of almost every person in this room.

In ideas, in attitudes, in institutions, in order to reach a proper place, and in order to make the changes that are necessary, some painful transformations will be needed. So you may find that even though I have such an affectionate and loving feeling for those of you that I have met and that I have heard speaking here, you may find me somehow aggressive - not because I want to be aggressive, but because *if* the future of architecture is going to be something worthwhile, and *if* we can hope to make a serious contribution to this 21st century—well, then, an enormous part of what was done and undertaken in the 20th century will have to be abandoned.

To put it quite bluntly, in the 20th century, totally wrong paths were taken.

The Dark Family Secret In Our Profession

I could see yesterday, listening to one person or another person, or somebody struggling with the problem of architectural curriculum or the problem of

design, that, in so many cases, deep down, we all have the same kind of aspirations, the same understanding of what is beautiful and what is not, and what is important and what is not. Yet the ways of thinking about architecture, the ways of doing things in architectural education, the daily attitudes that are carried forward, these are completely contradictory to our deeper aspirations that we have about architecture.

It is this knowledge that what has <u>not</u> been said, what has been hidden for fifty years, that makes our situation painful, like an attempt to dredge up a family secrete that has gone unmentioned for too long. So, you can begin to see, this is a terribly painful situation. And, what is even more painful is that in order to make progress in it, we will have to confront one another. I don't mean "me" to confront "you". I mean on a daily basis you will need to confront one another and we, all of us in the profession, need to confront each other in order to confront the problem.

And I feel, since I have been invited here, I must speak about all this in some detail.

A Simple Calculation About The Very Large

The first concrete thing to think about has to do with numbers, and the extent to which we felt free, in the 20th century, to abandon our responsibility.

There are six billion people on Earth right now, and there are, roughly about one million square miles of habitation. By this I mean, areas where people are living and working - not including agricultural land. The number of architects in the world is, we are not exactly sure, but is something between 500,000 and one million. Now, if you just start with the most basic questions and professional ideas, you have to say "*Look, those of us who are architects, we are very lucky, we have the opportunity to do what we love to do, and so, we have a responsibility somehow, to give to the earth what we have been taught to do*." But, if you make a very simple calculation, every one of us architects essentially needs to feel responsible for an area of about one to two square miles, everything in it, all the buildings, all the outdoor space, all of the morphology of that square mile. I don't, of course, mean literally one actual place, but one square mile (maybe two because the numbers that I'm giving you aren't quite right).

Imagine that in your lifetime you should take care of, with moral responsibility and responsibility of attitude, such an area. It would mean that every year, if you had lifetime of, let's say, 50 working years, you would have to do all the construction (again, in terms of your moral responsibility) of an area of about 300 x 300 meters. It's a lot to do in a year, and most of us, as architects, can't say that we are doing that every year — that would be just

simply too much. Now again, I'm not speaking about being in charge of it, I'm just talking about the moral responsibility that comes from the idea that in our profession, our compassion and our concern is with the structure, the morphology of the built world.

This simple arithmetic that I have just explained to you already shows you that our profession is not even organized in a way to deal with the magnitude of the architectural task on Earth. The architectural schools are not organized to think about that sort of thing. Occasionally one finds programs in architecture schools which have to do with areas of poverty, or areas of larger issues of housing or that sort of thing, but really it's not part of a common attitude - normally one is content to deal with a building, a museum, a house, and things like this. In fact, even if you have a practice of 3, 4 or 5 architects then between the people in that practice, they have to do not two blocks by three city blocks but 30 city blocks in a year. Do you see how fantastic that this is? We don't even have a practical way to think about how to do that. And yet, just starting from the very simple facts about how many people there are on earth and how much area is covered by the built environment, you can see where we get to very quickly.

The Very Small

Well, the problem gets worse than that. It becomes more complicated because at the other extreme from this very large scale is the problem of the very small scale.

For reasons which I will go into a little bit later, when you take seriously the structure of a building and you say "*How can this building be made a good building*?", it's not really possible to make a good building unless the level of attention to the building is down at the scale of centimeters. It is when you carve a piece of wood or form a piece of concrete or shape and glaze a tile, then – and only then -when that level of detail is carried out, reaches down to that scale, that the larger building has a possibility of becoming something. The fact that the larger can become really 'something' only through levels of attention that go down to the small detail – it is impossible to overestimate the importance of this fact.

The great Turkish carpets are great because they are beautifully organized down to a tiny level of detail, often no more than 3 millimeters. A human being is alive because it is organized down to the individual cells – all different – according to their local adaptation. And a building which is alive, and great, is organized down to the scale on inches, or subtle adaptation, ornament, refinement – all different according to its place.

Of course such levels of attention pose tremendous problems because you can't take stuff like that seriously unless:
#1- there actually are craftsmen
#2- that you have the opportunity to learn these kinds of things
#3- the authorities in the architecture schools will allow you to do this
#4 - you have the courage to get involved in actual building and not only just in making drawings

These are the kinds of complicated questions which we will discuss. But, at the moment, all I want to draw your attention to is: on the one hand, we have a huge moral scope of the enormous part of the Earth's surface that each one of us in this profession, in a way, should and must have some moral responsibility; and yet, on the other hand, in order to do "good" work, you have to be working down at the scale of centimeters to make buildings that are beautiful. So, this is a phenomenal stretch.

The 20th Century's Deadly Widgets

If you look at our situation in terms of a larger social history, really there has been an intent to justify the miserable modes of mass production that were introduced in the 20th century and somehow validate them to make people feel that they are OK. But, of course, they are not. Unfortunately, our profession was completely taken in by this. For the last hundred years (more or less) we have been acting as though these modes of production are acceptable, and as a profession we have been producing buildings, by the thousands and tens of thousands, that are little more than deadly widgets, large, small, and in-between. And really it is just a sales gimmick from companies, banks, developers and social and economic conditions that made it necessary to do (what shall I say?) very hasty, very sketchy, very abstract kind of repeatable structures, just in order to somehow get in between those two ends of this spectrum.

The 21st Century: A New Way To Be Personal

So, the program that I believe is inevitable for serious future architecture that we could believe in, is one that both deals with the very large scale of our responsibility on Earth, and also deals with it in a very loving and intense way with individual buildings, dealing with every centimeter, through construction, through craft and so forth. Of course including computers and all kinds of incredible high tech tools which come to our help to do those things - I'm not implying that it should be some sort of ancient craft.

But, indeed, I <u>am</u> implying that it must be <u>personal.</u>

There's another aspect of what I call "personal." We may call it the "biological." You really don't have to think about this intellectually. When you have the natural world with its natural laws, you have millions of organisms and the organisms are growing and within each organism every cell is uniquely adapted in just that way that I was talking about so that among 250 cells in the human body no two are exactly the same, because each one is perfectly adapted to its unique position in the whole. Just so with buildings. The one centimeter of brick or tile or wood or steel in every wall and every window, and every room, must be a level of attention. You'll find that the level of adaptation of an organism goes down to a very very tiny level and if a human being, for example, had suddenly imposed the rule that all the cells had to be identical, the organism would just be absurd- I mean, it would fall apart. You can't have an organism like that because organisms don't work that way. There aren't that many different cell types in every human being, only about 250, but they are all adapted to exactly where they are so each one is different and fits according to where it is in the finger, the fingernail, the face and so forth. This is the way it always was, of course, in traditional building. You in Turkey have thousands of beautiful examples of such traditional buildings - it is the means of production of a kind where everything could be adapted perfectly to just its particular place and its particular people, and so forth.

This adaptation raises never before-imagined problems of subtlety, complexity, and devotion. It requires that every five centimeters of every building is adapted, shaped, to fit local and global aspects of context, ecology, position, human need, human desire, color, material, and function.

One of the greatest challenges we face, is to create an architecture where buildings, once again, have this living order. Without it, our towns will never be all right.

Who Has The Knowledge to Create Such Living Order

The problem of implementing such living structure is immense. And there is a social and political problem, even more complicated than the technical problem I just mentioned. We know, pretty much, that adaptation in buildings can't be any good unless it is done by the people who live there and work there. I mean, one of the reasons why traditional environments are so loved is because the people who live there and work there had considerable power. Not very big power, but just enough power to make each little piece the way they wanted it to be, and the way they knew that it had to be: the

step, the door, the window, the roof, the overhang, the column, the railing, etc. - all made by people acting for themselves in their own interest and just making every little piece comfortable.

Our present relationship to the population of human beings on the earth, I mean, our relationship as a profession (the 20th century view of the profession of architecture) is totally at odds with that kind of idea. You know, "the client", "the user" and stuff like that . . . and they want to give the user 5 minutes of "Is this what you want? Oh, thank you . . ." Or 5 minutes more so that you can have "a discussion" (hah) - that's silly, that's absurd. You can't create a human environment like that, and yet if you read the social literature about architecture and what people have said about architecture, of course it is always mentioned that it is a social art and it has to do with human beings; it has to do with the welfare and adequate day-to-day living of human beings. I think people believe that, I don't think that it is cynical. I don't mean to imply that somehow there is a cynical attitude in the profession, what I am saying is that the institutions of the profession are not presently telling us how to make these things possible. So when somebody says *"Well, I'm actually involving the users in a project somehow . . ."* we feel grateful because they have taken a small step in that direction and will lead perhaps to some interesting results. But that is quite a long way from having the six billion people on earth taking part in the construction of the world.

The Pain Begins

Now, all that is just the background for our discussion.

I believe I had to say something like this just so you understand my feelings, anyway, of some kind of vision of what the profession might be trying to do. And what might then raise the question "How could we, as a profession, attempt such things? What kind of institutions could we have that might achieve such things?" And then, of course, "How would we teach?"

I think that you can tell from what I'm saying that I do have one very strong prejudice - and that is the following. The program of instruction in architecture school should NOT be guided by the current form of the professional activity that exists outside the school. This is because when we are thinking through how to do these things, and how to move and what changes to make in progress, well, what do we do with the idea that our students have to fit the profession as it is today? This is the first serious point of pain because students from decade to decade change. In the 1960's students were very idealistic, in the 1980's they were very materialistic - I'm talking about in California, I don't know how it was here in Turkey - then in the 1990's it got a little bit different, and now it's different again. Certainly there were times when students said "Oh, I have to have a job when I leave

this place, so please prepare me to do a job so that I can earn money when I get out from school." So it's a complicated assertion to say "don't be guided too much by the structure of the profession today". This is a very nerve-wracking and hairy problem, but I believe it is necessary that we confront it at last.

Criteria for Quality

Anyway, this is a sort of background of the situation as I see it. Now, I'm going to stop for the moment and take on the major topic of the bottomless pit. First I want to introduce the topic, so I will tell you a funny story:

I was on an accreditation board for the Department of Architecture at Rice University in Houston, in Texas, about 20 years ago. I was one of those horrible people who come around and say "Your school is/isn't adequate to teach architecture." There were about five or six of us and we went there for three days and we talked to lots of students, we talked to faculty, you know what I'm talking about, all of you have been through these things. I only did one thing, I thought " OK, I'm going to ask the students the following questions". I met a lot of students and to every student I met I said "*Do you know the difference between a good building and a bad one?*" Everybody said "*No*" - every single student. I went on like that for three days. When it came time for the report, our committee met, and I said "*Well, these students don't know the difference between a good building and a bad one, so of course we can't give them accreditation.*" My colleagues on the committee said "Yes, but we can't just not give them accreditation. That's too extreme, Alexander." I said, "Yes, but seriously, if they don't know the difference between a good building and a bad one, then, my next question is: *What is it that we are accrediting*? Not only do the students not know, but they also have professors who are not giving them this information. So they don't know, and they aren't even being taught by the professors how to know that." So I said I was sorry, but I couldn't approve of that, could not agree to give them their accreditation.

Of course then there was a meeting with the University President, and politics demanded that they gave the school the accreditation anyway. So, in spite of the fact that no one in the school knew what a good building was, or was willing to define it, anyway, my colleagues on the Board gave the school its accreditation. My view was relegated to a "minority refusal".

But you see how comical and serious that was – and still is today. The only practical thing my comment translated into was a statement at the bottom of the report which said "you must try to do better."

The Pain at Faculty Meetings and Curricula Discussions Continues

Yesterday, at this conference, there was here some discussion about criteria of quality in buildings. When you are teaching, what are the criteria that you use? How do you help the student understand "is this building better than this building? or is it worse?" But what about this building? Compared with the others, is this one better or worse? The real tragedy, in my opinion -- one that I have experienced almost continuously, year-in year-out, at the University of California where I taught for nearly 40 years -- is that the way of thinking about architecture which existed in the second half of the 20th century essentially and completely refused to ask that question. That is, absolutely because the question is so difficult.

What happens in a school, whenever questions of comparison between buildings or projects come up, is that you hear all of these incredible excuses of pluralism, that everybody should do what they want, that our job as the teacher is to encourage whatever the direction the student wants to take and that "nobody is right," "everybody is right," "you can do whatever you want," etc., etc. Again, I am quite sure that you have all experienced that sort of thing. You may not have called it quite just what I have called it, but actually it is the reality -- not only of teaching circumstances which I will speak about, but also at faculty discussion. The single reason that faculty discussion about how to improve the curriculum was inhibited, and virtually stopped cold, for the last 40 years, was that the faculty can not look each other in the eye and discuss that question because it is too frightening and too painful.

Each person is wedded to their own particular idea, cannot let go of it, has no idea whatsoever how comparison of values might be disused rationally or intelligently … and so, instead, everyone runs around it, steers away from it, no one wants to look another faculty member in the eye, and say "Your own building, that one, is not very good…" And in the panic, the social impossibility of answering that question, or having that discussion, the subject is forced underground. It never gets discussed, because no one can bring themselves to discuss it.

And from that, you go directly into the intellectual and moral chaos which pervades every school of architecture in the world today.

The Bottomless Pit

<u>And why is it so frightening? Why is it that people cannot confront each other, or even discuss this issue politely. It is because THAT QUESTION is, at present, an intellectually bottomless pit.</u>

The reason is, that in the late decades of the 20th century, there was hardly one faculty member who was not vulnerable to this problem. If I raise such a question about my neighbor's building, then of course, quite rightly, he can raise it about mine. And he will do so. But if mine, too, is erected on a base of nothing but arbitrary opinion, thinly disguised "notions" or "images" that have no solid root, going all the way down, intellectually, to a solid base – how then can I survive a discussion like that.

I cannot survive it.

So of course, I tremble in my corner of the faculty meeting, and say nothing, happy that no one wants to visit this terrible terrain, happy that the question which will undermine my truth, will undermine everyone else's, too, so there is a conspiracy of silence, where everyone agrees not to mention this subject that has the capacity to undermine us all.

That, the family sitting on top of a dark secret which everyone knows, but no one can mention – that is the dreadful secret which has haunted schools of architecture, in every country of the world, for the last forty years.

A Seminar In Which Degree Of Life Was Used As The Criterion, And In Which Everything Could Be Compared.

I remember well, how frightening it was, thirty years ago, when I made the decision to work with my students, on the basis of the idea that their work was better or worse, <u>objectively</u>, and I would boldly call out in our classes, that this work was better than that work, even for a line or a tiny sketch, I would compare, and make people see that the quality of life was objective, could be compared, and that almost any two things could be compared from the point of view of the deep life which they contained, or did not contain.

I took my life in my hands, every time I entered that classroom, because I knew how vulnerable I was. I could only survive by being right. If I started saying that A was better than B, when everyone could see (or feel) that it was not so, then I would be dead very quickly. I survived by being right some of the time, and by being humble all the time – even when it seemed I was arrogant, I always told the students when I did not know which was better, or if I had doubts… but I NEVER EVER claimed that it was merely a matter of opinion.

And in that classroom, the students really began to learn.

Of course, such a path actually is frightening, you know, because each of us is extremely vulnerable, especially when we create things. So, if you create something, to have an atmosphere of "is this thing OK or not OK?" or "how

about this thing compared with that thing that you have made or that person has made?" is so hard. We don't want to have to face the question "is one of these things I have made really not so good? and another one is really better?" So, faculty don't like to discuss that. It is much easier to say "Look, each person has the right to teach what they want to teach" It is not only fear, but also a humanitarian wish to avoid that human and social pain. It is the same thing in the classroom, because when you have your students come up with their various projects, of course sometimes professors like to be nasty to students, but most of the time actually they don't. You don't want to be constantly fighting with the students, especially when you don't know what to tell them. So to avoid the question of who is right, and which project is actually good, there is all kinds of incredible claptrap that means nothing but somehow gets through these awkward moments and so one feels one is talking about something. So everybody can feel, yes they are still professors and they are still students and we all know, more or less, what we're talking about.

But all this apparent comfort is gained at great expense. To be comfortable you have to lie about almost everything, make up ridiculous stories about what is important in design, and so on. Do you think this is an exaggeration? It is not. Unfortunately, it is an accurate picture of the state of affairs in 90% of the schools of architecture in the world, 90% of the time. The question f what is good and what is not good is the core of our work as architects.

How can we, or the students, know what to talk about, or what to build, if we don't address that question, as an architect? Yet we have not had a sensible way to talk about it for 50 to a 100 years.

A Good Theory Allows Predictions

The pain attached to making judgments of quality, openly, becomes a little bit more obvious when you yourself actually <u>build</u> the things that you design. Because, then there is no getting away from it. I mean, while you are building it, you can tell whether it is beautiful or not. It is very difficult to make beautiful things . . . you can't really avoid it. But anyway, the main problem is not that. The main problem is that the discipline of architecture that has been created in, let's say, the last 70 years of the 20th century, simply does not have a way of dealing with this question. Yesterday, at this conference, there was some discussion about theory. I couldn't hear all of it (I am a little hard of hearing and occasionally I missed some important points), but, the impression I had was that the thing that was being called theory wasn't really theory. Instead, the thing that was being called theory was a sort of programmatic declaration of some kind, like 'THIS is how we should do our architecture', 'THESE are the kind of things we are going to do', or 'THESE are the kind of steps we are going to take,' always with the ferocious emphasis

given to the word THIS to make you feel the speaker knows what he is talking about.

Of course, this is not real theory in any way. A theory has to tell you something reliable, something you believe because it is confirmed empirically by experiments or observations you can do of your own knowledge. Basically a theory has to enable you to make successful predictions.

I'm not speaking now only about science. Even if I say: OK, in this realm of architecture where we are, where we are trying to make beautiful things, or adequate things, or living things, <u>anything that is truly useful and that could really be called a theory will essentially tell us something about that problem, and truly, empirically, enable us to predict how to do better</u>. This is a little different from the theories which occur in physics or biology where they are purely concerned with a certain sort of fact, because here there is fact which enters in and is fundamental. In architecture the comparable thing is whether or not a certain kind of structure is going to have living attributes, is it going to be full of life? Is it going to be beautiful?

One wants predictions like that, one wants information that will enable us to achieve that, a little bit more, a little bit more, a little bit more . . . Only when a statement does this, does it usefully, does it reliably, and does it in a way that many people can agree, does it have the right to be called "a theory of architecture."

A Small Example of a Tiny Bit Of Predictive Theory

Let me give you a very simple example of something that is almost naive you might say, but it is actually theory like that, in a very practical sense (it may seem funny to you because I am calling it theory).

When you build a building, it doesn't matter if it is a masonry building or a wood frame building or a steel building, the following thing will happen: if you enter into the various spaces while they are still being formed, you will see something about how the windows ought to be. Of course, you are standing there, and the walls are already existing or partially existing or something like that, and you can begin to judge what are the right ways to make the windows in that room. The theory simply says that 95 times out of 100 whatever was on the drawings WILL NOT be the thing that you experienced when you are standing in that half-finished room and know where the windows ought to be. Now, that's an incredible piece of information, if true. Of course you don't necessarily believe me, but I am telling you anyway that it is true. Because, think about what it means, and what a huge practical result follows from this bit of theory.

That is theory because as a piece of information it tells us something about the process of making a successful and more living or more whole environment. But of course this particular piece of information has kind of a delicate twist, because under normal circumstances of standard architectural contracts you are not in a position to affect the building at that point. You can if you want to spend a lot of money on the contractor's change orders, but no client would allow you to do that, and anyway it is stupid to do it. So, the whole set-up between making the drawings, preparing the working drawings, and then the contractor building the drawings is already wrong just because of this one piece of information which I have just given you.

Of course, one could give 50 pieces of information like this . . . fifty, or five hundreds examples of things that are genuinely theory, because they have reliable and useful impact on making buildings better.

Postmodernism, deconstructivism, transparency of structure, and many other fashionable ideas which fill the architecture schools today, are not theory in this sense.

Using Our Souls As Theory

But of course, you may come back to me, and say: All right wise guy, how are we supposed to know what is "better?" What test can we perform to get this clear, empirically?

Let's just imagine a small project for students - making a wall 50 or 60 cm high. Very many students wouldn't even be aware that such a small trivial problem has a significant meaning. So students say 'Well, what do you mean exactly?' 'What are we supposed to be doing here?' Let's say the students make such a wall, and I say, 'do you like it?' They answer 'well, no not much.' A student might say, 'it's OK'. So I say 'I don't really want to stop this work, yet' . . . (I used to do these projects, very short projects, I would give a project like that, maybe for a week, and then another one the next week and so on and so on. Sometimes it would be a little tiny thing and sometimes quite a big thing). . .

So I would say to my students 'I'm not going to stop this project until you can tell me that you really, really, really like the wall that you have made. So, that helps some students, and they say 'Oh, you were talking about that, I see, OK, well then I will have to do it a little differently' and then they make something better, something that begins to touch the heart. Sometimes they make something graceful, sometimes they make something simple, instead of looking over their shoulder at the architectural profession, and they think it is

kind of cute or something. Then, again, usually, I say 'Well, are you <u>really</u> satisfied with <u>that</u>?'

"Please do it better. I know you can make a better wall, one which is really worth something."

Anyway, gradually I will then introduce to my students the following idea. It may seem perhaps somewhat fantastic to some of you, not to all of you I hope. I say, looking at two real walls, 'Look, here are these two walls, one may happen to have some blue on it, so we call it the "blue" wall; the other has red streaks on it, so we call it the "red" wall. Now, I say to the students, I want you to tell me, looking at these two walls, which one is a better picture of your own soul?

 They say 'What on earth do you mean? You can't be serious? What are you talking about?' I say, 'No, I'm serious, it's not a funny question, and if you think it is stupid, it doesn't matter, just answer the question anyway.' It doesn't matter whether you believe in the soul or not, it is not a religious exercise. It just has to do with architecture. So please answer.

The students say 'Well, if you force me to answer that question, then I have to say THIS one -- as they point at one or the other – this one is a bit more like my soul.'

Each student does this exercise, choosing one wall or the other. Now, what is utterly remarkable, even though the question seems to have to do with that student and that student's private feelings, the extraordinary thing is that, more or less, all the students will agree which of the two walls has more of this quality.

Within a postmodern, pluralistic, liberal-democratic, framework, we could interpret this situation in a pluralistic way, something like this, then, as the instruction to the students in their next project: "If you want, you can make it look like <u>your</u> soul and yours like <u>your</u> soul, and your soul and so forth, each student meaning something different. But that is not what happens in practice. In practice, gradually, students discover that if they use this criterion, and become better and better at doing it honestly, they make more and more significant works, more and more beautiful, meaningful, living stuff – and everyone can see it, and there is a gradual convergence towards true quality.

Actually it turns out when people try to do that -- what they do is to make things that are quite universal in the depth of beauty that they reach. By the way, by passing in this direction, even with a very inexperienced student, within a matter of weeks or months you get them to make objects that are extraordinarily profound. Even, they may not have any training as artists, but

just the impulse of that question teaches them the meaning of value in works of architecture.

The bottomless pit is finally mastered, and the unspeakable can be addressed.

Living Structure

Looked at from a rational, and scientific point of view, we may use different, more neutral language, to speak about these things. In the most ordinary language, we may say that our goal is always "living structure," and the empirical methods which ask an observer to make judgments about the degree of affinity between different structures, and his own soul, are simply practical, experimental methods which allow us to focus, successfully, on this profound empirical issue.

 This particular experiment that I just described is one of a dozen similar kinds of experiments that can be done to distinguish between a more living structure and a less living structure. So, the question of what has more life and what has less life is accessible to empirical investigation.

And the results, even though what I just told you sounds a bit far-out (you might think 'Oh God, he's been smoking dope, or living in California too long or something like that), but actually it pierces right to the heart of the question of <u>What is the living structure of buildings</u>? And so, issues which are of an <u>ecological</u> nature or issues which are of a <u>social</u> nature or issues even which are of a <u>structural</u> nature (that is, having to do with engineering structure) are <u>all </u>amenable to an investigation by the general approach of trying to find out whether a certain thing is more living or less living, has a more living structure or less living structure. I gave the example of the little wall, I could have given an example of something smaller, or I could give the example of a big civic complex occupying three blocks, or something even bigger than that, and applied the same techniques of investigation for those things or the relationship between the buildings and the land and the spaces between them.

Moving Toward Shared Cumulative Knowledge

We will not be able to have a profession which solves the huge and complex problems that we have experienced in the last century unless we have a genuinely cumulative way of arriving at knowledge about what makes buildings work.

Some of you know that many years ago I published a book called <u>A Pattern Language</u> where, in a way, there was some investigation of this, it relates

somewhat to what I have been telling you just now. If one looks back at those things and say 'well, what actually are those patterns in the Pattern Language? Those patterns are configurations which predictably are likely, not certain, but likely to increase the 'living-ness' of the structure where they are put in. Of course, not always, and certainly they are not always even relevant. But anyway, some progress was made there.

Now, there's another level of 'structure' if you will, that can be pulled out-- where you can also make predictions which are more geometrical kinds of properties. For example, I was just thinking about geometry when I was talking about the way a building relates to the land and the space between the buildings. One of the most fundamental issues that will always be relevant in determining whether or not a building or group of buildings has a living structure is how positive the space is. That means, that every little bit of space is positive (not amorphous, left-over, or dead feeling) and that every entity is positive - not very easy to do. This is one of the reasons that I have been so much helped by 15th century Turkish carpets. At that time, the Sufis and other people who wove the carpets were very, very conscious of positive space and did it to an unbelievable level of mastery. You can learn a lot about positive space is just by looking at one of those carpets. But of course, you can also learn it from looking at the plan of Rome or Istanbul or you can find it in thousands of ways - it is just that we, in our period have actually become conspicuously bad at the geometry of positive space. I mean, this building where we are meeting is a nice building. But is the space just outside the front of the building a positive space? Of course not. We just take it for granted, we accept the bad space, we don't think about it any more. And, it is not just outside space which has to be positive, but every little bit of space everywhere, inside the building, every passage, every bit of space inside the material substance of a column, even, all of it must be positive, before we can begin, even, to have living structure.

Again, you can use this information to make predictions because you say 'If I do introduce this kind of positive space into a project again and again and again', it will move towards living structure and it will tend to have the quality that someone will say 'Yes that is a very good picture of my soul.' And I don't use this remark frivolously. I know that it is a strange phrase, I apologize, it is almost embarrassing, but really one can't avoid it. It is just the way it is.

How am I doing for time? Quarter past ten? I have to stop now, don't I?

Cumulative Knowledge on the Internet

I should say one last thing. The Internet has given us, now, an unprecedented opportunity for sharing information, and for accumulating our knowledge. We have the opportunity to write down things we know, whether patterns (static information about living structure), or about generative sequences – dynamic sequences of operations which will reliably create living structure.

One place you can find such material, is on our own website, where we have tried to make a beginning at this kind of thing, in the hope that others will join us, and follow our lead in trying to put out sharable information. You can find our site at http://www.patternlanguage.com.

I have taken too much of your time. Thanks very, very, much for your warmth as an audience. Thank you again.

Questions

Q: Could you explain a little bit more about your living structures notion? You have written about this, but you didn't really say much . . . could you explain . . .

CA: Yes, I will say more about it because it is very difficult to demonstrate without real examples. Yesterday I had an interesting discussion with our colleague from Lisbon and he was talking to me about his teaching philosophy at his university and I said 'Well, you can't get those kind of ideas across to without actually making real things, real projects of some sort and testing them out all the time because to listen to philosophy without actual examples is hopeless.' And he said 'Well, that's not my job, I'm not allowed to do that.' So I said 'well, anyway you just have to tell the authorities that this is philosophy and you have to make the students do things.'

Now, let's take a very simple case. Suppose we are interested in a room in some design project and for some reason this particular room is interesting enough so we really want to make it good. And I am not talking whether it is in my office or at the university, it doesn't make any difference. (By the way, I forgot to mention that, I mean, I could not imagine how to teach without using real projects all the time, and involving the students in the real projects. It is the only way that I have taught for 40 years.) We very rarely made preparations in the way of drawings. The first thing with this room would be, let's say, to make some models out of paper, not even cardboard, just paper. No more than that, really. And we look inside and . . . I said paper rather than cardboard because we are constantly playing with a pair of scissors and tape and chewing gum and stuff like that . . . I'm looking inside this room to see does it have the feeling of, let's say it is a meeting room of some kind, so we look into this thing and we start to judge whether or not it has the qualities that I am speaking about.

Now, what I want to emphasize, you will understand in a moment (it appears as though I am not directly answering your question, but I really am). Immediately, very, very quickly, you say 'Well, I have to check and see, we have to make it maybe an inch longer just this one wall, right. It has to be a little bit longer, the ceiling is not communicating very correctly with the room, and the feeling created by that ceiling is not positive in this way.'

And remember, all the time, I don't use pretentious language about the soul every day when I am in the office, but actually everybody with whom we are working together we all know that is the question to answer.

So, we are looking until the inside of that room starts to have such a positive quality. And the first thing which is very unusual it took probably, let's say, 10 or 15 steps with the scissors, gradually, at that scale, to arrive at something that has a little more value, much more than one can achieve on a drawing by the way, because on a drawing you can't even see those qualities that I am talking about, but in the small paper model you can.

So then we say 'OK, fine, it is time to make a slightly bigger model.' So we make a model which is, say, about one meter by one meter) and again we stop to say 'OK, now this time we really need to understand how the wall, the windows, the whatever, to get a more detailed feeling of things, furnishings if there are any, just what is this room doing? How is it put together?' In an extreme case, if it is a very important room, we will get some 2x4s and essentially make a mock-up of the room at full size using string, cardboard, canvas, stuff like that, trying to judge the qualities of that room and how deeply it succeeds in having that life itself.

Now, what I am trying to illustrate here, I know I am not actually answering directly what EXACTLY is 'living structure', but the thing that I am illustrating is: whatever it is, you can only get to it by a long, serious of successful approximations. It is in the nature of that structure that it can only be arrived at empirically. A "shorthand" definition of living structure might be a structure that unfolds through successive differentiations from a one wholeness to the next. A one week old human embryo to a 30 year old man or an acorn to an oak tree –these are structures unfolding -always whole at any point - each next differentiation coming from the evolution of the structure itself. In architecture we are relying heavily on our feeling of that wholeness to guide our steps.

Q: I'm not an architect, but I would like to find out what is the difference between expression, to express something, and to construct something. It looks like, for example, for expression, a line on an empty paper is enough, just a line. Or a car crashed that wall and the wall is still standing. I think the

soul must be involved only when you are constructing it, that's the way I understood it.

CA: That's very true. May I tell a story? Somebody better stop me because otherwise I will go on forever.

This is a story of an old craftsman that I knew, Mr. Ishiguro. He worked for me in Japan. He was eighty years old and he was a master of making something that in Japan is called 'shikkui' -- a very, very highly polished beautiful form of plaster that was used on traditional buildings. And he was one of the last living craftsman able to make this stuff in the old way. He made a lot of plaster for me on a big project that I built there.

His son was sixty and at one point I brought the two of them to our workshop in Tokyo and I said 'Look, could you show me some examples of how you do this and what you do?' Old Mr. Ishiguro made a panel about one meter by one meter of black shikkui; his son made a panel of green shikkui because I also needed some green plasterwork in the project, so I just wanted to see that, too. . .

Now, you know, the way they make this shikkui surface is that they have a series of trowels, about 10 trowels, with each blade thinner and thinner and thinner and the last one is like paper . . . it's so flexible that it is thinner than a razor blade, almost like a brush.

And so, gradually they troweled on the shikkui. Watching the old man doing was something in itself. He just loved that stuff, he stroked it and stroked it, and stroked it, really as if he were caressing a woman, he went on and on, and after stroking it and loving it for an hour or two, just to do this small surface of one square meter, the plaster began to shine. It was not like glass, more like soft shiny skin or paper, with a glow to it. Watching this glow appear in the surface, was something in itself. But though it glowed so softly, it was durable, made for-ever, permanent. The glow stayed in the surface.

Oddly, though, his son, the sixty-year old, who was doing the green plaster, did not achieve the same thing. He did not treat the plaster the same way as his father. And the green plaster, though smooth and beautiful, excellent work by any normal standards, did not have the love put into its making as the black plaster did; and it did not have the same depth or shine of the black, almost as if an immaterial substance had been created.

I asked old Mr. Ishiguro, why there was a difference between the two. "Ah yes," he said, "my son has never learned it. He takes care of the business end of things."

"But he is an excellent plasterer," I said… "Yes, yes," the old man said, "that is true. But I have been trying to teach him how to do this for more than forty years… he just cannot grasp it. It isn't in him."

"The life, the soul of the material, has not been liberated in his work. The young no longer know how to grasp these things."

Q: Firstly I would like to compliment you, Professor, because it was a remarkable talk. Secondly, I would like to ask a question about the models, not the three dimensional models but the 'wall models'. How can we learn from them? In my town, in Lisbon, we have the experience that those builders learn, and they can build very beautiful things and beautiful urban environments, if they learn from environments built by architects. So architects do not need to build everything, do not need to draw everything. The downtown of Lisbon was built by architects and since the 1930s in Lisbon, that role model continues to live and to generate beautiful urban environments without the intervention of any kind of architect, only those guys. So, I would like your opinion on this. That's the first question.

The second question is about this relation with students, about learning to build and construct a livable thing. You always talk about this dialogue, and the question of the soul, to build a thing where you recognize yourself, where your soul is, but don't we also learn from the relation, the experience with old buildings, having them as models?

CA: Ah, yes, of course, we do that, but . . . I am going to talk about the second question and then the first one.

You see, we have been passing through a period where our profession as a whole has been very very nervous about old buildings. And, in a way, it's appropriate. However, just to copy old buildings or be inspired by old buildings and so on, it does not make much sense because technology is so different, the procedure is so different, the kind of building is so different. So, you can't just say 'Well . . .' Of course you can say that we should be inspired by old buildings, that's one thing. And certainly I always would like to say I am trying to make something as good as those people made. So, I look at that stuff a lot. But I don't look at it with the idea that 'I am going to copy that thing.' Because actually not only is it not really practical, but you have to invent completely different techniques, and also because of the atmosphere in the architectural community-- it is kind of an embarrassment, you know. There still is this dialogue going on: some of the very formal looking architects, you know, they are looking to the next decade or something, they get very uncomfortable if you start saying 'Well, actually you should be looking at the buildings from the past.' Personally, what I told you today is not looking ten years ahead, it is looking 100 years ahead. I mean,

I'm talking about a completely different human society, biological society, and therefore it is necessary to have internal criteria which do not depend on history. It is not because I have disrespect for history, I have a huge respect for it. But, you can't use that as a main source. That's my answer there. The source has to be internal. The people who built those buildings, they got it from the same kind of stuff I am talking about. Of course, they also got it from their history and tradition.

The other question, about the builders and the architects in Lisbon and so on, I got so confused while I was talking that I didn't actually just say it:

As a builder, as a . . . you can not take responsibility for making buildings unless you know how to make buildings. You don't learn how to make buildings from playing around on pieces of tracing paper. I mean, you just don't, it is silly, there is no way, and yet, this is the most absurd contradiction of all: that we have a whole profession devoted to the making of buildings but actually you don't learn how to make buildings. I mean, you learn nothing about it. My students, they learn about concrete pouring, they learn to plane pieces of wood, they learn all these things. It is not because they are going to become 'lowly laborers' or something, it is just that they want to make real buildings so therefore of course they want to learn these things. And then they can also tell other people how to do them. You can't tell somebody how to make that a wall, if you don't know how to make the wall. And the fact that you have learned something in architecture school which enabled you to draw a cross-section at half-inch scale or something, or the way a footing of a wall works, I mean, my God, is that enough to tell you that you can tell someone how to make a wall?

We Have One More Question . . .

Q: Thank you for your very interesting lecture. I am from Uludag University. My question is related to your expression about details. You talked about the intention of details which I really agree with. As you know, a psychologist said that 'the whole is more than the sum of the details, or the parts'. How would you place your idea of details within this psychology? that is my first question. And secondly, how have you developed the idea of pattern language? I mean, more than 30 years have passed since you have first developed this idea. In these 30 years, is there any other difference in your idea about pattern language other than the 'sequence part' which you mentioned.

CA: Yes, because from a practical point of view please understand that we are only just in the beginning of it. We have only been working on this Internet site (www.patternlanguage.com) for about a year, but our intention is to

create a network of builders, architects, crafts people, and lay people who can successfully work together. Of course, we are only beginning at the moment mainly in the United States, hoping that the same kind of thing can be repeated in other countries.

The people who try and use the sequences that we are providing them need some kind of support. They may not need support in order to make a design, but certainly they need support when it comes to 'How are we going to implement that building? What kind of people will help us to do it? What kind of people will help us from a professional point of view - engineers, architects? What kind of people will enter into the construction process, so that we can trust that they will work from what we have done?' For example, this is a very fascinating innovation which we are just putting up right now, that the construction process itself is not based on working drawings but is itself based on generative processes so if a client or a user makes, using one of those sequences, has a layout of a house and says 'here's how I want my house', then this process will allow us to give that sketch, which is really not more than a sketch, to a builder or an architect-builder who has the generative process that will tell them how they can build from the sketch all the way through the complete construction, without working drawings in between, which is a major innovation, a very very important one. There are other important contractual innovations.

So, we are trying to create a whole network of these sort of tools, and of the people who know how to use these tools. Does that answer what you are asking?

It is a huge amount of work. I mean, I don't think that it will be finished, ever. If we are successful, it will go on and on and I hope also that it is capable of becoming a kind of model for how architecture should be conducted, and how architecture education should be conducted. I think now maybe it is time for me to stop.

Maybe One Last Question?

Q: A Zen master (This is a well-known story) was approached by a student and he asked 'Master, master, what is the meaning of life?' The master did not answer and the student asked again 'Master, master, what is the meaning of life?' The master walked away.

CA: Thank you all very much. Thank you for letting me speak to you, and for your time.
(applause)