

A CONVERSATION WITH CHRISTOPHER ALEXANDER

Author of *Notes on the Synthesis of Form*, *A City is Not A Tree*,
A Pattern Language and - just released - *The Nature of Order*

Katarxis N° 3

London, UK September 2004



Michael Mehaffy: *We're seeing some astonishing things coming out of the sciences just now. Geometry seems to be the hot topic - the complex structure of proteins, the unfolding processes of embryology, the distribution of large-scale structures in the cosmos, and so on. And there has been more confirmation of the fantastic notion that life itself is a certain kind of geometric structure. From there it does not seem too big a leap to the assertion that consciousness, and the conscious experience of quality and value, are rooted in geometric structure as well. Certainly recent work in the neurosciences seems to suggest this.*

Of course, you have been arguing something like this for years, and developing it as the basis for a more advanced architecture. You have criticized the kind of abstract expressionism that has bogged down modernism at the level of sculpture, and you have argued for a much broader and more adaptive architecture, one more rooted in the geometries of human life. The new sciences seem to us to provide a lot of fresh evidence for your assertions, and to point the way to some very promising new tools for evaluating and perfecting the qualities of a built environment, along the lines you have suggested.

You recently said you find these new geometrical insights of science very promising and exciting. What is it that you think is most exciting about these new developments from your point of view?

Christopher Alexander: *It's the idea that, instead of talking about architecture in traditional terms, which invite all the criticism about romanticism and about being buried in the past - all of this actually just being replaced by an emerging body of fact which establishes the substantial nature of these claims.*

You know, up until about 1600 it was essentially religious authority that held sway, and one did what that tradition said to do. And people were comfortable with that, and there wasn't much need to be questioning it.

Around the time of Descartes and Newton, something else happens - the authority that comes from things is the observations of our own senses. We're going to pay attention to what we can see and what we can identify and what we can know. And the criterion for knowing it is, that whatever we hold to be true can be put in some kind of experimental form, that another person can then be convinced of. And that unless something meets the standard of being sharable in that kind of sense, it isn't going to pass muster.

Now that's an incredibly powerful thing that's been running now for about 400 years. It's really swept the world. And it has made the world what we know it to be today. But the thing is, *value* has not been included in this approach.

So you've got all this stuff which has this wonderful way of being shared, by observation, experiment, you own eyes, your own fingers, and so forth. But all the matters of value that we're fundamentally concerned with as architects - they slip through the net, they're just not dealt with. They're all seen as arbitrary.

Now, if we successfully put forth the idea that *value* can be discovered through an experimental procedure which gets results, which helps people to reach agreement, and therefore is sharable, this suddenly puts value in and among that huge movement that began around 1600. Where suddenly, we're looking at an understanding of things that can come from fairly simple experiments that we do by examining ourselves, and our reactions to things, but in a very special way.

So I do think that the new scientific developments which have occurred, the whole slew of things in computer science, simulations, generativity, complexity theory, of course - all fascinating, all very important, because it provides foundations for those sorts of things as well. But the real crux of it is arriving at a sharable method.

And so I think this issue about the scientific cauldron which is capable of giving birth to this material is a phenomenally powerful thing.

MM: *And historic?*

CA: And it is historic, yes.

MM: *You speak in a very direct and personal way, and as you said recently, that is the essence of science - the ideas and the discoveries of what works. You can put all the window-dressing and the other parts on it, but that's not the science.*

CA: My interest is in buildings. And I'm a scientist insofar as I try to understand what's going on in buildings, in a reproducible, accurate fashion, and try to tell the truth about it. I'd say that the principal thing that has helped me to thread my way through this rather incredible briar patch is trying to tell the truth about what is really going on - when you're in a building, when you go into a building, when you come out of a building, when you use a building, when you look at a building, when you look out the window of the building, and so forth.

And I'd say that the biggest problem with 20th century architecture was that architects became involved in a huge lie. Essentially what happened at the beginning of the 20th century was really a legacy of the 19th. New forms of production began to be visible. And in some fashion artists and architects were invited to become front men for this very serious economic and industrial transformation.

I don't think they knew what was happening. That is, I don't think in most cases there was anything cynical about this. But they were actually in effect bought out. So that the heroes

of, let's say, the first half of the 20th century - Le Corbusier, Mies Van Der Rohe, Gropius even - a very nice man, by the way - were brought on board in effect to say, OK, here's all this stuff happening, what can you do with it? Let's prove that it's really a wonderful world we're going towards. And instead of reflecting on questions about, well, what was it that was going to be wonderful about this world - from the very beginning, the architects became visual spokesmen, in a way to try to prove that everything was really OK. Not only that it was really OK, but somehow magic.

You know, there was this phrase, *elan vital*, which was bandied about a lot in the middle years of the century, and in the early years of the century as well - of, there's something incredible happening here, we're part of it, we're reaching forward. But all of this was really image factory stuff. And what they didn't know about the late 20th century was only known to a few visionaries like Orwell and others who could actually see really what was going on.

I don't think this is a very flattering view, and I suppose architects would reject it, angrily. But I do think it's true.

MM: *It's essentially a program of apology for industrialism?*

CA: Glorification, of something that is inherently not glorifiable. And it's really very very similar to the ads we see on TV every day now, except this was being done with architectural imagery, and with buildings. And the architects are busy, right to this day, still trying to perpetuate that process that they successfully did in the 20th Century.

MM: *In the book you speak about the Cartesian world view, the mechanistic world view, and how it is, at least for you - and you've made parallels to others - giving way to another world view, a world view of process and of complexity. Are your critics trying to understand you in terms of one world view, and you're speaking from another?*

CA: I actually don't think it's as deep as that. I think they know they're not doing very good work - especially the mainstream architects. And they don't really know what to do about it.

Going back to your other question - you know, I'm still really working at the question you asked me about science. The first rule of any scientific effort is observation. You know, you have to see what's going on and tell the truth about it, and not get hoodwinked by preconceptions. And so in that sense of course what I did was very deeply rooted in science, and in my scientific training. And it was the intellectual struggle that I have had to go through over these 25 or 27 years of writing this book [*The Nature of Order*], because the things that it seems to me necessary to conclude as one studies what is really true are staggering. I mean they are completely inconsistent with the scientific world picture that we have believed in certainly the 20th century. And so especially for me, given the fact that I came from a scientific background at Cambridge, I had the most incredible difficulty actually writing this stuff down.

So gradually then, things arose out of that which I suppose people may claim kinship of all sorts.

There are so many major unsolved problems, which have reached similar conclusions for parallel reasons. Wholeness in quantum mechanics, for example, or unfolding of geometry in embryology. So you have lots and lots of things which have reached surprisingly similar conclusions, for very different reasons, just because people facing scientific problems in these different fields somehow seem to be coming up against a brick wall. Same one. And that I think is due to the fact that the world picture we've had doesn't support reality very well.

MM: *And do you think that those people in those other fields are also changing their world view, in a parallel way to what you have discovered?*

CA: I think so, yes, I think that's quite true. And I think that actually very similar problems have arisen in physics. [David] Bohm¹ faced tremendous difficulties - I mean, even though he probably was the person who made the single biggest contribution to understanding of what's really going on in some of the perennial puzzles of quantum mechanics - they wouldn't even let him lecture at Berkeley the last time they tried to get him here. And Brian Goodwin for instance, in biology - absolutely on the forefront of this kind of thinking.

I think there are dangers in all this - I don't like "woo-woo" land at all.

MM: *And you have been accused of being "new age" and so on.*

CA: Yes, for example, right. And so in some ways I quite deeply regret having had to write the book that I've written. You know, because it has a taint, almost.

MM: *Simply because it's against the current world picture?*

CA: It's partly that, for sure - but the ground is so treacherous. If you just take the subject of wholeness, for example - good lord, it is difficult. It's really difficult to get a strong firm grip on the concept, on the structure that it has, even how to talk about it clearly. There are peculiar things like self-reference in the logic of how you have to talk about it, that are very uncomfortable, for somebody who is used to normal scientific thought.

If we're just talking as architects, and we're talking about a particular room, let's say, and we're trying to figure out how to build the windows in that room, so as to make the room as good as possible... Now, the thing that's going to get us furthest in making that attempt is painstaking observation of our feelings as we are in the room, whether let's say the room is unfinished or something, whatever state it's in, and we're trying to guess what kind of window is going to have this effect. And whether we do it through mockups in the full size or whether we make models or we even try little sketches or whatever it is we're doing. But what we're trying to read is what depth of feeling comes into being because of the window being such and such a size, shape, position, and so forth. Now, this is hard work, very hard work.

MM: *The core task is to figure out how to make beautiful places. And the other parallels in science are a supplement to the core task, more a reinforcement, or an echo if you will, of what that is?*

CA: Right, yes exactly. It's partially even - you might almost call it a political effort. Because I think that this very bad form of architecture that has existed is vulnerable to this particular attack. And the reason is quite simple. You see, the thing is, the modernists really - because they've got their head in the sand to cover up the traces of what was begun so many decades ago, and was essentially founded in really untruths, they have to keep saying, "I don't want to know the facts, I've just got to keep going with this thing that we're all supposed to be doing." So they're all very vulnerable to the question about, well look, there actually are scientific ways of asking about these things and studying them. But if an architect of the modernistic persuasion is so vulnerable in his actions or his thoughts or his work that he can't dare to consider this possibility, then that will very quickly become very visible as a huge weakness.

MM: *One of the goals of this issue of Katarxis is to explore the relationship with the Classicists. As we were talking before about alliances, is there a way that we could have an alliance, in spite of whatever differences there might be?*

CA: Well, by an odd coincidence, I wrote [something about this](#) for the [TradArch, U. Miami] listserv. I agree with you that it is a necessary alliance. I really agree with that completely. I don't have any doubt about it. And I think the same goes for the New Urbanism.

MM: *Yes. Andres Duany, who you know very well, said that Leon Krier's influence was a revelation for him, a formative moment. And I know that Andres is also sympathetic to the idea of "organic" order. And he once told me that something you said to him was the basis for "everything we're doing now."* ²

So that was one of the questions I wanted to ask you too - what's your advice for the New Urbanists? It relates to the one about Classicism, because that's such a strong strain within the New Urbanism.

CA: Right. I think that many of the people who are involved in the CNU actually have not understood the problems that the developer represents, and what has got to be done in order to change that situation. It's very very serious.

I find that one actually much easier to talk about than the Classical issue.

I feel emotional sympathy for the Classicists. You know, in reading the pages of TradArch, there's something so nice about the way they talk to each other and the way they like to talk about buildings. There's something very warm-hearted about it, which I find extremely moving. But I get off the bus when I have to start thinking about - well, I don't want to put Doric columns in the jungle, you know.

You know, in the history of modern architecture, there was a refrain that kept coming back, which was such and such is not honest - copying things from other times and places is not honest. And you may be surprised to hear that I completely agree with that. Although I think what architects did with this idea was crazy, because or course it became a mad rush toward newness for its own sake.

But it is undoubtedly true that in each era, forms must arise that come from the technology and economics and social circumstances of that era. So that if one sets out a program where you're essentially sort of copying old forms in any version, you're liable to be in a hell of a lot of trouble. And I think that trouble is evident. I think that to some extent it explains the slight smirk of discomfort that people have when they're looking at not only Classicist buildings, but what you might call developer kitsch. I mean, there's a lot of developers who certainly clearly understand that people do not want glass and aluminum houses. But they don't know what to do about it, so you get your - whatever - your Cape Cod, you know, lookalike, and all these different things.

So what I'm really saying is, developers have in effect got this problem, just like Classicists have got this problem. I mean, developers have other problems too, but I'm just saying this is not peculiar to people with a classical bent.

And I think that it is necessary to spend time - I would say major amounts of time - thinking only about form and geometry. Thinking about the language of form that is appropriate now. That we can use. And this doesn't merely mean, OK, we're going to have some generating system which is magically going to put things in our hands. I think that's a fallacy actually. Because although certainly nobody believes in generating systems more strongly than I do, but some aspects of the generating system actually have to specify geometrical organization.

And if we're not constantly thinking about, OK, here's such and such kind of a building, and here we are in 2004, what is a really comfortable and right kind of form for such a building. And how do we do it? And then of course, what's the generative process which will produce endless buildings of that kind, in that sort of sensible manner.

The Classicists, interestingly, have absolutely no problem doing those kind of exercises. That is, they spend a huge amount of time teaching people simply how to draw buildings that are good, in organization, shape, proportion and so on and so forth. And actually I don't believe it can be done any other way - except that I don't believe one wants to be using only classical forms for that purpose.

But when I say, I don't think one can do it any other way - you know, I think there's a lot of very intelligent people, who would love it if somehow one didn't actually have to make that artistic commitment, or take on that artistic act. And if somehow, from some sort of scrambled mélange of systems or dynamic variables, or whatever, that the form is going to give itself. And sort of come without the artistic commitment to it. And I don't have any problem with that thesis if it was true. That is, if you could do it. But I don't think one can do it. I don't think it works.

MM: *No matter what system, don't you need the human being there to say what is their feeling at any given point in time, and whether that is true for them?*

CA: Oh, certainly, absolutely you need that. No question about that.

I mean a very significant and interesting issue has to do with roofs. You know, 1965, 1970 it was completely taboo to use a pitched roof. There was quite a struggle - I played some role in that struggle myself, and I remember all the humorous episodes involved in trying to get students to say, yes, actually I can make a pitched roof, and think well of myself. But in fact I think that the pendulum has swung too far in that direction. I mean, it's one thing in a snow and ice climate, where you've got real problems with large amounts of snow sitting on roofs, causing snow load and all other kinds of problems. But in many of the world's climates, that's really not a fundamental problem. And also the waterproofing methods that we have now are so incredible compared with those from earlier times, that you don't necessarily have to have a roof that will literally let the water run off and shed itself.

So I don't think there's anything wrong with building pitched roofs. But actually what I've gradually come to find is that the buildings with flat roofs is a bit more comfortable in terms of seeming to reflect the ordinariness of everyday life. And pitched roofs are OK, they're sometimes unbelievably beautiful - but also sometimes, a little bit on the cute side. And it's not that easy to avoid that. And I find it curious that in an odd sense, a flat roof may be more suitable - leave things alone a little better, and so forth. ³

It's very difficult to define this, but there's something there that makes sense out of technology, that makes sense out of very vague, large-scale feeling of a certain kind of site, or certain kinds of neighborhoods, and leaves things alone better, and is actually, in an odd sense, more structure-preserving to the earth.⁴ Now this is not a universal rule by any means, but I'm -

MM: *It's an exception to the usual classical approach?*

CA: Well, definitely that. And it means that you're actually on your mettle, if you can even get an answer to this problem. You know, because you're thinking about stuff - my gosh, there certainly is no pre-cooked answer in history to be found to this. And it's a hell of a tough question.

Or another example, it's in Book 3 of *The Nature of Order*. We were suddenly faced with the issue of building marble floors for the Megaron in Athens, which is a huge concert hall. And the floors we were asked to do were about two acres in size. Very large concourses. And to do the kinds of intricate patterns of the kind that [*the owner*] specifically wanted in two acres, it looked as though there were likely to be 400,000 pieces. Now, just to cut 400,000 pieces of marble is an incredible problem in itself - let alone assembling it. On top of all that, we had

to put that floor in - we were given two months to do it. So we set out a way of using a water jet cutter, prefabricating pieces, creating circumstances where you could both do mockups while you were developing the floor, then you could do them again in the actual place.

MM: *Computer-controlled?*

CA: Yes, exactly. All of this sort of thing.⁵ Well, it really changes the result. That is, if you compare that with the kind of floors that were built in Italy in the 12th century, they're really different. And it's not, I don't think, all that helpful to say it's vaguely classical in feeling - actually it's not. But I mean somebody who is persuaded by Classicism might say, "well anyway, you know, the reason these floors are nice is because they vaguely resemble that sort of thing." But actually I think the reason that they're nice is that they have that living structure which I've written so much about, in a demonstrable fashion.

And that that's really what the people who have immersed themselves in classicism - that's really why they're doing it, because they have a passion for buildings, they don't know how to get that result, without emulating those ancient types. It really is not a harmful thing to do, but it isn't the best way to do it.

MM: *Right. I thought your paper ["Classicism and the Many Cultures"]⁶ did a good job of discussing the fact that tradition is really a much wider thing than Classicism, and you have different traditions all over the planet, and you have, you know, us in our day, able to make our own tradition. And tradition isn't at all something that's frozen in time.*

CA: Right. This business about finding a language of form which comes out of a technology, out of a technique, and out of the feelings that exist in our environment, is really the core of the matter. And although the modernists have - it's weird, because actually they would probably subscribe to a great deal of what I've just said. But what they actually do with it is so peculiar and often offensive.

MM: *And they were embracing a form of industrialization that was - how would you characterize it? Inhuman?*

CA: Well, it was really limited. It really was the first few decades of industrialization. And the things that were being mass-produced, and what could be done by mass production, were very limited. But more important, you know, all of that mass production stuff came from Taylor. And there are serious social problems. In other words, it came from something that's actually quite gruesome, humanly speaking. I'm just talking about the production techniques.

MM: *I wanted to ask you what you think is happening to technology today, particularly computers, and the potential to create a more human kind of technology at this point.*

CA: Well, it's positive. You know there's all these kind of one-off assembly lines now. Special purpose, car manufacturer, furniture manufacturer, and so forth.

MM: *Cabbage patch dolls, where each doll is different, to take a trivial example.*

CA: Yes, that's right. But still, nevertheless it's interesting. But the trouble is that even the people that I think are the most far-sighted and the most intelligent in dealing with that stuff are completely, I'd say almost 100 percent trapped in the notion of combinations. Of recombination and recombination of components.

MM: *The reductive technology in the early industrial period which still very much grips us? Pulling things apart and putting them together in little bitty pieces instead of trying to create wholes?*

CA: Right. And of course what happens in the biological world is that the wholes come about by differentiation - not by assembly. And that's an entirely different class of things. ⁷

MM: *That's a crucial point, isn't it?*

CA: Yes, very very - absolutely crucial. And probably - it's probably the single most serious issue, because without that you just cannot get there. And yet so much of the definition of an architect, the definition of a contractor and of a subcontractor, and all these things - they're all virtually assumed to be playing some role in the assembly process. And the idea that all these folks might be playing roles in a differentiation process, and that it really and truly was that, is just I think almost out of reach at the moment. And I think it's one of my biggest aims in the Nature of Order is to show what this means, that it is feasible, to set it up as a model of our profession, what we must do.

MM: *Something else I wanted to ask you about is that in our current view, everything is personal taste. And anyone who suggests otherwise is a dictator. And you certainly have had that allegation.*

CA: Oh, yes!

MM: *Right. And so, to go down the path of saying, well wait a minute, everything isn't personal taste, is very frightening. Are we heading towards, you know, something where our freedom is going to be taken away? I mean it's terra incognita.*

CA: Yes, it's a complex subject. Actually, it's ironic - in a way, it's quite peculiar, because probably of all living architects, I'm probably the one who's most catholic. So, it's quite a stretch to do that, and yet it's very effective.

MM: *And there's a related concept I wanted to ask you about, and that is that tradition implies authority. Tradition in the broad sense, not just tradition in the Classicist sense of following a historic pattern.*

CA: Right. One of the things which I am trying to do in Book 3 ⁸ is, in effect, say look, there's this family of forms, this idea of living structure. It does seem to me quite plain that we must draw our material from that family. And if you go outside that family, you're going to continue to devastate the earth.

OK, so now let's just think about some numbers for a minute. Because that statement can have a lot of different interpretations.

One interpretation, an extreme one, is that for any given problem, there's only one solution. I mean, I've been accused of saying that, which I've certainly never said. The second, slightly more sophisticated version of that is, that as you're wending your way through the path of a design process or a building process, there's only one best step to take at any given moment. Also not something I've said. But of course if those things were actually said, it would indeed be frightening, because it would have a sort of deterministic quality which would be actually quite strange and I think uncomfortable, for anybody that was doing anything. ⁹

The real situation is quite different from that. I've got an appendix in Book 3, where I discuss the number of possible configurations, how many of those are living structures. And all of this is quite difficult to make estimates of. But the numbers are fascinating because

they're so utterly, absurdly gigantic. If you take a sort of middle-size building, a few stories high, and you say, OK, how many possible arrangements are there within the volume of that building and its immediately surrounding open space. Now the number that you come up with is one of those numbers that looks deceptive, it's something like 10 to the 10th of 17.¹⁰ I mean, it is a number so utterly insanely huge, that's the number of all possible configurations within that sort of volume.

So then you say, alright, well now how many of those are probably living structures? Can one make an estimate? And that number is an infinitely small fraction of the first number that I just told you. But even though you have to divide that number by 10 to the godzillion, to get down to the living structures, when you try to estimate this out - the number of living structures is still utterly gigantic beyond measure. Far, far larger than the number of seconds since the universe began, or the number of particles in the universe.

So that what you have to realize as an architect, thinking about generative theories, and thinking about unfolding... suppose that you're in a process and at a given moment, there might be, let's say a thousand things that you could do, and let's say that there's a hundred *sensible* things to do. And you're going to take steps over and over and over again over a period of a year, let's say. So you're going to make these kinds of choices, and you're going to have the opportunity for a hundred choices, twenty thousand times.

So that any idea that this is deterministic, or that this really putting you in a bind because it's authoritarian or it's under control, or it's whatever - is just actually the sheerest nonsense.

You know, I've known quite a few traditional craftsmen, in real traditions, in different societies and different cultures. I've never met a person who was in one of those traditions, who felt themselves to be in a bind, who felt themselves to be locked into something, who felt themselves to be under authority. Of course what they actually feel is free. Because they know what to do, and therefore they can do whatever they want.¹¹

So that this whole discussion about totalitarianism - what it really boils down to is the contrast between freedom to be arbitrary, as opposed to freedom to be appropriate. And if - of course if you want to have freedom to be arbitrary, that's one thing. And much of what we've got going on in the world of architecture today is based on that supposition. If you want to be appropriate, you can still do a million different things, but being appropriate is going to guide you, and that is what is going to tell you what to do.

MM: *We talked a little bit about tradition and traditional cultures, and you addressed that in your paper on TradArch.¹² And I wanted to touch on what you think is happening globally right now, with other traditions, and where that's all heading and should be heading. I'm thinking in particular of the idea that there is a huge reaction to the western modernist tradition around the world. And some of it is obviously murderous and horrendous and evil, and some of it is understandable, and something that we should perhaps pay more attention to.*

CA: You mean 9/11? Oh, I think so. I think that there are two, kind of parallel courses. Of course, one of them is, that we've got this really incredible economic dichotomy. We've got five billion people who have a small income, and about one billion people who have what we consider a normal income, but it's actually a huge income by comparison. And of course it's absolutely inevitable that that is going to lead to consequences - which I've actually been waiting for since the middle of the twentieth century. So I wasn't particularly surprised by this event.

But I think that there's a second aspect which you essentially just alluded to very clearly. And that that of course is people feel that their birthright is being taken away from them. And that provokes a lot more anger than just being poor. Actually it's far more serious. And I

don't think it's exaggerating at all to say that these things are manifest in what is called terrorism. And they need to be dealt with. I've done my best to build in a number of different cultures, and to try to get somewhere close to cultural reality, in a pretty wide range of places. And occasionally, I've been successful.

I remember, when we did the project in Peru. I think there were 15 architects from different countries in the UN, site of the competition, and then there were 15 Peruvian architects, designing these houses for Peruvian families of low income. And the judges, who were largely Peruvian, actually concluded that we had done a better job than the Peruvian architects, by - you know, I don't know if you know the history - ¹³

MM: *I recall that you studied very carefully the way those people lived.*

CA: Well, yeah, we - absolutely, we became members of families. And so, you know, we really immersed ourselves in it.

MM: *And isn't that the distinguishing feature of a human architecture? It isn't simply a form that is a piece of art that everyone should admire, it's something that addresses everything about a culture and their lives and the way they live?*

CA: Yes, I think so. Actually one of the things I'm very proud of is that during the 70's and 80's I had students coming, you know, from India, from Japan, from Latin America, from the Soviet Union, every country you can imagine almost. And what was incredible was, they came to me to find out what it meant to be Chinese, or Indian, or Alaskan, or Greek. And what was so incredible was that because this process that you're talking about has gone so far, that there's - at least at that time - relatively little sympathy for it quite often at home. So for instance, in Greece, they don't want to know what it means to be Greek. Or in China, in fact, by the time the 80's rolled around, they started dismantling their respect for ancient Chinese culture completely, and trying to build - trying or actually succeeding, in building western monstrosities.

MM: *Right. The towers in the park, the Radiant City all over.*

CA: Yes. Right. I think it has begun to change. And of course one of the parts of the world where it has actually changed most dramatically is in the Islamic countries - partly as the result of the Aga Khan's program. And partly for reasons I think that are different from that, possibly related to the whole apparent conflict between Islam and Christianity. You know, whether it's in Turkey or Iran or Jordan or Egypt, people have begun to repudiate the stuff that has been thrown at them. And I'd say it's probably made more progress in those countries than anywhere else on earth. And that's a very very important thing.

MM: *In talking about what is happening around the world today and about human culture, of course one cannot separate what is happening in the natural environment. How do you think architecture must address the problem of the natural environment?*

CA: I believe that the whole idea about the natural environment has been turned on its head actually in a very strange way. For about a quarter of a century, people have been in effect obsessed with saving the environment - which is of course a very sensible thing to do when it's being ravaged and destroyed.

But the real problem is that we won't be OK, in terms of building or in terms of nature or anything else, until we learn how to *make* nature.

There's nothing irreverent about saying that. What we think of as nature is a particular kind of structure. We feel tuned to it and we love it, and I think if one has a sort of romantic feeling about it, or a historical feeling about it, or emotional feeling about it, it kind of gets

focused on bushes, water, sky, trees, the animal kingdom and so forth. And no one really stops to say, well, what is it about that stuff - why do we love that so? Why are we singling it out in that way?

Now all of what we call nature is marked by the way that the whole system keeps on differentiating itself and unfolding and adapting, so that every piece of it is adapted in some utterly incredible way to the things that are immediately near it or the things that are somewhat further away.

It sounds a bit abstract when I say that. But really that is the crux of the problem. Because in the artifacts that we produce - and I'm not only speaking of buildings here - we have no clue how to do this.

We don't know how to do it actually any longer even on a farm. At one time farmers took it for granted that they knew how to create versions of nature-structure. But the farms that have grown up in the last 50 or 60 years have really abandoned that, and have essentially been commercialized - going to massive production techniques which are very largely damaging. And the key thing again is that even these farmers no longer know how to create this intricately beautiful, infinite adaptive system, which gives us joy, pleasure, comfort, relaxation, wisdom, and so on, even when we rarely come in contact with it.

So, people who built buildings certainly used to know how to do this kind of thing at one time. There really was an era when buildings were very gently inserted into nature, and whether people were making towns, or villages, or fields, or simply looking after the forest or the ocean, they were always making nature.

Today, if you say to somebody, we should be making nature, it has a completely zany kind of ring. Because starting around 1970 there was this - I wouldn't call it a movement, really, it was just an inclination of people, who were so sick of Skidmore Owings and Merrill and things like that, that they started wanting to make organic shapes. And so one started to see hexagonal houses - god knows why people thought that was organic, maybe because of bees or something - Buckminster Fuller domes, hippie buildings, made of earth and sticks, that kind of thing. I think the majority of people didn't really like the products of this kind of thinking. And in fact it never really went anywhere. But when you talk about nature, and trying to make things that are related to nature, that stuff is one of the things that comes to mind.

Making nature is really an incredibly different thing.

At the Monterey Aquarium, there's an artificial beach. It's very very amazing. It's entirely indoors; it's like a cross-section through a beach, it has the water, they have a wave-making thing. And then it has the sand going up and the little dunes and then the big dunes and all that.

The fascinating thing is that all the animals stay there. I mean they actually can escape. But it's so perfectly tuned to the realities of what such a beach is and what it does for its inhabitants and so on, that all of the various creatures - of course they vary across the cross-section - are basically OK, and want to be there, and recognize it and are part of it. I remember when I first saw that thing, I was absolutely staggered that anybody knew enough to do that. And in fact I visited again a few months ago, and I had exactly the same feeling.

So going back to the question - because your question as you first posed it has to do with, well what do you think about forests and animals and whatever, all being desecrated, unfortunately.

But the idea that one has to actually be in the position of those people who made that tiny little beach in Monterey aquarium - I think that penny has really not dropped. But it is beginning to drop among what let's call ecological souls - people who like dealing with water and plants and natural cycle and that sort of thing. And that's becoming quite good, and there's a lot of careful attention to it.

But the thing is, that what has not happened, is that people understand that the same attitude precisely goes, must go, into the making of buildings, or a wall, or a window, or anything else.

And if you say, well that sounds fine, but what does it really mean, how do you actually do that? - the whole of architecture opens up before you.

Now earlier we talked about the traditional architecture enthusiasts, Classicists and all of that. And I told you then that I was somewhat uncomfortable with that.

The reason is that although I think for the very very large part their hearts are in the right place, and so indeed are the New Urbanists, and various other kinds of people... all doing their best to think about better ways of building and so forth....

But the idea that a building when correctly made is going to be given the kind of structure that makes us practically fall on our knees when we see it in a fir tree or in a bit of moss - that has actually not materialized. Because of course the processes needed to do it are so remote from the processes that are currently available, in contracts, and in production of materials, and in - well every aspect, almost, of the way that architecture is done. So that it is a very far reach indeed to reach towards that, very difficult to think about.

But as we now are beginning to have this genuinely scientific theory of what architecture is and what to do, then that will be obvious to us, and that's what we'll be doing. And we won't have to worry about Doric columns, or classically proportioned windows, or any of a very many many other kinds of things that are like that.

Now, the idea that it's actually possible to make a building or parts of a building that really and truly have that sort of resonance, is stunning and fascinating and fabulous. It does require paying attention to absolutely different sorts of structures. It does not require getting into weird kinds of geometry, which is what I alluded to a moment ago - which is what people think of when they start talking about "well we've got to make buildings like nature." Because it doesn't mean "like nature" in some simple-minded geometric way - it has curvy shapes, and therefore we should have curvy buildings, or any of that.

It has to do with the grain of the adaptation. All the different structures.

And I am quite certain that as one learns how to do that, discovers how to do it, discovers what it really means, the so-called "classical" shapes - and I'm now using it in a very much more embracing sense, I'm not just talking about sort of Greco-Roman heritage, I'm talking about all of what we know as traditional shapes - will turn out to be the kinds of things that you have to do to make well-adapted space. So that all of it has to do with nature. All of it has to do with "being-nature". Of course once one has that perspective, there's no need to seek union between buildings - i.e. bricks, mortar, concrete, wood, glass, and so on - and on the other hand, chlorophyll, cell structures, flowing sap, hydrology and so on. Because it is actually all governed in the same way.

So really, in a way the answer to your question that I would like to give is, it isn't a question of finding a union. The union will follow automatically, if we get inside from underneath and come up inside the glove. And actually know what it is. Then we'll be doing it. Whether we're doing it, you know, in planting a rose bush outside a window, or in dealing with a patch of grass, or in laying up a certain kind of wall in a completely new and previously unknown technique.

MM: *We were talking before about the idea of what happened around 1600; we've had this historic period for 400 years that has been marvelous in many ways, it's created this incredible abundance and so on. But it's also done something rather horrendous, in creating a relationship with nature - "nature" in the broadest scientific sense - that nature is something that's dead, essentially. That's been a very powerful illusion, a very productive and useful illusion, but still an illusion.*

CA: The thing that I'm struggling with is, trying to elucidate what it really means to make nature when, for example, you're building a building. I mean it is of course connected with what you just said. What I'm concerned about is that this can so easily become a kind of mantra without having a substantial enough content.

Let me give an example of an exercise one might give to a student, perhaps. If you say to a student, OK, I want you now to draw an abstract drawing which has the character of nature. An abstract drawing of - actually could be almost anything. So it might be a frieze running around a room. It might be of a plan of a couple of rooms in a very small house. It could be a wall with a bottom and a top, or whatever. And if you simply say to that student, please draw this so that it has the character of nature, and can you do that, and do you know how to do that - my experience is that students have a very great difficulty doing that kind of things. Because essentially they don't understand what the question really means. And so there'll be various attempts, different things will be tried. It'll be - OK, what about organic shapes, will that get what the professor wants? Or it could be tried, what about integrating it with rock gardens and water, is that what he's talking about? Or, it could be is it sustainable in it's, you know, a piece of sustainable ecology? Or then we can obviously go in for the weird shape thing.

But of course all of these will be wrong. And actually even the better of them will have only a little bit that is actually true and worth holding onto, in guiding the students' pencil as this person who is trying to draw something which actually is a part of nature, which has the character of nature.

This is something that is actually really quite clear, and if we were sitting together, I could draw you something in a couple of moments that would be like that. But its main feature would be that it has this peculiar and distinguishable structure. And that gradually, what happens is, you learn, somehow in your bones, to do that - that is to shape things that way, and not some other way. And it really is a morphological characteristic.

You know, the Bauhaus had as part of their original curriculum, exercises which had to do with just drawing the shape of certain things. And one later I think began to be a bit doubtful about those, that they were too formalistic, and so on. But actually this activity that I am describing might be taken also as very formal, formalistic even, because it does have to do with, well what kind of shapes are actually, recognizably, natural in that sense. And it's a knack about how to do that. It's a knack of course that can be learned. It can be learned, and it must be learned by observation. You have to try to do it, and then find out what it is about it that you can't do and then try again and keep on until actually you are drawing stuff that is like that.

I remember when I was about 30, I began to notice that some of Wright's plans had this quality in them. I didn't know what it was at that time, I just noticed that they had a very soft and gentle quality, in the bones of the drawing. And that was actually probably about as close as any of the so-called modern group of architects ever actually came. But it was fascinating, because I realized that I was looking at something that I could recognize, didn't really know how to produce, didn't even have a name for it, had never in my studies ever been given by anybody some sort of notion that would enable me to name it, recognize it, talk about it, emulate it.

And unfortunately, for example, with CNU - which I think is fascinating, because this is such a powerful movement, and it's just sort of taken hold in a good way, I mean it's great really that so many people are enthusiastic. So I'm proud of them, because they've really done something to help change things. But when you say, well, what are the rules that they actually live by? I'm talking about "live by" when they're shaping something, modeling it, drawing it, planning it, things like that - building it, and so forth - the concepts that they are living by there are not those which I've just been speaking about, having to do with whether you're making part of nature. They're actually something highly artificial, and in fact, some of those folks I think pride themselves on being quite deliberate creators of artifice. Because they almost enjoy the fact that the man-made artifice is something in its own right and of wonder and so on, and then they say, well, that's what we are trying to do. And we're trying to discover the old rules about that artifice.

But this knowledge about making something so that it is nature, is a much deeper thing than that. And it needs to be understood differently, and it needs to be practiced differently. And once you can do it, you don't make that many mistakes. So I think that if we recognize that it is primarily a morphological issue, and that it is not the morphology that has been traditionally associated with nature by architects - you know, all those examples I gave a minute ago. But it is a morphological awareness that we need to develop, and it could be developed.

MM: *One of the criticisms of new urbanism is that it does not account enough for process. It tends to be designed all-of-a-piece, and as you put it, master planned through the conventional developer process. And that process is the characteristic of the natural morphology you spoke of? That's how it arises - through the process?*

CA: Absolutely. Completely, and that is the fundamental aspect of it. And it actually cannot be faked. You cannot produce it any other way.

I remember when I was at Berkeley, sometimes my colleagues would get mad at me because I said I didn't want to come to juries, I didn't like them, and I thought that they were the work of the devil! (Laughs). Of course the reason is that if you believe in what you're seeing or attempting to do in a typical jury and so on, that's completely at odds with those sort of processes, so you will never be able to get it by that form of teaching. So it actually is a very bad thing to do, and a very unfortunate thing that has been inculcated in schools. And yet for instance, they have, you know, all the vocabulary about the parti - and the very terminology there is dead wrong, and supports just the whimsicalities of the Beaux Arts, not that they were terribly bad, but they're certainly not about nature in the sense that we're talking about.

But it is a really massive task to replace those concepts with concepts that are nature-oriented and that are profound.

One of the difficulties, I think, in these last decades, has been that the people who liked ecology or who wanted to take seriously those sort of things, were always in a funny sense on the periphery in architecture schools. And they were always vaguely looked down on by the people who had all this stuff about the Beaux Arts and so forth, because it wasn't sufficiently morphological. Now, you see, it's funny there because actually I think that criticism was correct. But I don't believe that what the Beaux Arts had to offer was correct. But the more general statement that the morphology is the foundation of the whole thing - it has to be.

MM: *The result was incorrect. But it so happens that the process that the Beaux Arts people were assuming was also incorrect?*

CA: Absolutely. The Beaux Arts people were right in saying, "look, really, morphology is everything. Don't try to be an architect and not deal with morphology." As you say they had a very peculiar and very narrow view of morphology. But the problem is that the ecologically

minded people of our time, even though one might want to embrace them and say, you're brethren, you're trying to do the same thing I'm trying to do and so on, but actually they are not dealing with morphology sufficiently. Therefore, in a certain sense they're not even allowed into the dialogue very much.

So that if there's a group which is sort of NU based, and then ecologists come along, and say we like you, we like what you're doing and so forth - but actually the ecologically minded person hasn't got the vocabulary of morphs, of shapes and forms and the generation of shapes and forms, just happens to know a great deal about plants and animals and insects and water and so forth. But that isn't far enough to achieve the kind of thing I'm speaking about at all. Because until you can say, no, look, let me hold your hand and show you how to move the pencil here - and this is the kind of thing which is for real, and is actually making nature when one is in the sphere of buildings, this is a different activity. And once that becomes crystal clear, then everything will change.

And I am extremely much hoping that these interviews and what this interview is about will help to make that change. Are there things you would like me to speak about that I haven't gone to?

MM: *I would like to relate this idea back to the idea that nature is something much broader than the woods and the foxes and so on and so forth. It is the structure of things, in the broadest sense. And we have an understanding of that structure of things that is really revolutionizing the way we've looked at the world in the last 400 years.*

CA: Yes.

MM: *And I personally think, and I think the other three [editors of Katarxis] feel the same way, that this is an incredibly powerful tool to use as a critique of what's been happening, and a recognition that there has to be that process, that hand, that goes through the iterations, goes through the process of creating the structure. Instead of taking an abstract structure - as you put it in *A City is Not A Tree* so beautifully - a simple mental structure that you begin with, and you pretty much end with.*

CA: If one takes seriously the idea that it all resides in process - and that that's not just an empty phrase, but really, the kind of morphology that we're referring to here as nature, is produced only when certain kinds of processes go forward, they've got definite sequences, they unfold in certain ways, and so on - if you take all that seriously, then you would expect in a sense never again to see an architectural studio where students try to lay out an entire urban design project or a subdivision.

Instead what would be mandatory and natural, is that every student would be struggling with a generative process, the class would be struggling with simulations, where everything is going forward step by step. And the question is whether the regulation of those processes that go forward step by step leads to coherent and beautiful results. And that's a very concrete thing.

It just at one stroke would say, OK, we're going to stop 500 classes in different architecture schools in the world today, and we're going to replace them with that today. Of course the same thing can be said about engineering structure, about the plan of a house, it can be said about anything. But it's particularly vivid and clear, because one can certainly imagine simulations in which step-by-step processes can be tackled by a group of students, and you can either get chaos or you can get good results, you can get in-between results. And to get really profound results, and to ask, well, what processes will achieve that, then you say, well, we've got this class, and these people are putting buildings one by one, bringing them in balsa wood or in cardboard or in whatever, on this group model. And we're going to keep doing

this class until they've come up with something which is as good as the Piazza del Duomo in Florence.

And then you've finally got a process which is actually going somewhere.



Footnotes

1. The late David Bohm, whose work is being carried on by Basil Hiley at Birkbeck College, U. of London, among others
2. Duany told this author that Alexander told him "we both know what the correct appliance is; now you have to design the plugs to go into the existing power grid." See the separate interview with Duany, also in Katarxis 3.
3. See the gallery of Alexander's work, also in Katarxis 3, for examples of this.
4. Alexander discusses these ideas extensively in Book 2 of *The Nature of Order*.
5. Alexander has claimed that he is a modernist in the sense that he believes in using contemporary technologies in a unique expression of unique conditions; in this respect he differs significantly from the so-called "classicists" who believe in a faithful return to classical architectural forms.
6. ["Classicism and the Many World Cultures"](#), posted to the TradArch listServ.
7. Alexander was one of a number of 1960's-era architects - a group that included Charles Eames - who examined exhaustively the implications of standard building systems.
8. *The Nature of Order, Book 3: A Vision of a Living World*
9. There is an interesting parallel in Steven Wolfram's book *A New Kind of Science*, to which Alexander's *The Nature of Order* has been compared. Wolfram's book describes the totality of irreducible algorithms as a better explanation of reality. But taken to its extreme, this logic leads to a kind of Laplacean demon, creating a deterministic (though unknowably complex) reality.
10. This is equivalent to 1 with 100 quadrillion zeroes after it.
11. The apparently paradoxical argument goes like this: because these craftsmen have a vast range of possibilities defined within a structured tradition, they can choose between the possibilities; whereas a person outside of a tradition has far fewer options available, hence is actually less "free."
12. ["Classicism and the Many Cultures"](#), posted to the TradArch ListServ. See "Additional Links and References."
13. Center for Environmental Structure, *Housing Project for the Poor*, Lima, Peru, 1968.