

The growth of order from small acts, 1974

Lecture to the Department of Architecture, University of California, Berkeley, February 6, 1974.

This lecture, an early rationale for what is now sometimes called “bottom-up planning,” was presented to the Department of Architecture at UC Berkeley in 1974. Using examples of biological growth to start, and followed by descriptions of several current projects, the lecture concluded as a “call to arms” against modernist urban planning. The lecture hall was full, and the positive reaction of many of the students, who cheered at the end of the lecture, was very different from the visible anger of some of the long-term faculty, two or three of whom were sitting in the row just in front of mine, and who left very quickly. When he gave this lecture, CA was 37 years old.

The transcript of the lecture, done from a tape recording, was unfortunately not complete—major gaps are indicated in the text—and the slides referred to were not available. And because it has not been edited, it shows CA’s conversational approach even in major lectures. But it has been included for three reasons. It is descriptive of a major issue—that of piecemeal growth and the necessary agency of ordinary people in the development of the built environment—that occupied CA throughout his career. It points up the ways in which CA thought about projects while carrying them out, to investigate fundamental ideas, and to justify strong reactions to conventional wisdom. And it shows his willingness to talk frankly in public about tentative ideas, that are in the first stages of formation or realization.

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What I want to talk about is a re-casting of one’s ideas of what it means to create something. I suppose most of the people in this audience are architects or architectural students. The essence of what I’m going to try and get to is the notion that has developed in the last fifty years of what it means to create something from an architectural standpoint is simply wrong. I take the desire to create something, the creative instinct, incredibly seriously. I believe that the feeling that a person has to want to shape something is one of the most wonderful feelings. I think that it has been made quite ugly and distorted and I hope to persuade you of that, actually by a rather simple appeal to certain facts.

I am really going to talk in three parts: the first part of what I have to say is rather theoretical and deals directly with the matter that the title of this lecture concerns—the growth of order in small acts. It has to do with the question of what is order and I shall try to persuade you that order can only come about from literally millions of almost infinitesimal acts, and if you accept that, that fact alone would change your conception of what it means to create something, either as an architect or as a planner. In the second part of what I’m going to say, I’ll give a number of examples of the recent work of the Center for Environmental Structure. I’m giving these examples to show what you might call groping toward the matter that I’m talking about. It will be the longest part of what I have to say. And then at the end I’m going to try and say a few words about—what if one takes all this seriously, what it actually mean for the profession of architecture and the profession of planning. Because if you take me seriously, it will force you, I think, if you have not already come to these conclusions, to examine very, very hard what you are doing as an architect and what it means for you to create something now and in the future.

I would like to begin by showing one or two slides, first of some plants and then of some very simple traditional buildings.

I think it would be helpful if I start with a very personal statement. For ten or fifteen years, all of my concern with buildings and with planning and bits of towns, has had to do with the fact that the most beautiful things in the world are things like what you’re looking at in this picture. When I ask myself

“How am I going to make something, what am I really trying to make? I take the bits of grass and the flowers and the trees around me always as the most fundamental models of anything. I have done this for many years, and all of the rather muddled and slow, painful theoretical progress that I’ve made in the last few years, has actually had to do simply with my own wish to be able to make things as beautiful as that. I realize, of course, that it is almost impossibly difficult. I will not succeed and you will not succeed in matching the beauty of these grasses, but still I do take it seriously as my ideal and I am saying it and dwelling on it, because these simple grasses have a property which none of the buildings of our era have in the slightest degree. Now this property, quite simply, has to do with the level and the degree of the internal adaptation of the parts to one another.

And that in turn has come about in these grasses or any others from the way in which this thing has grown—slowly, as a whole. And in growing slowly, as a whole, and in literally millions of minute acts, first at the molecular level, and then at the cellular level, and then at the level of the individual blades of grass growing and flowers blooming, this thing has gradually come into being. And every one of these small acts, every one of these minute, interactions of a molecule with another molecule—the growth of a cell in a particular position, the growth of a blade of grass, each one of these things is happening in a position where it makes sense with respect to the whole that is immediately around it. As it is happening, it adapts itself to every particle of what is there already: it is swayed, shaped, modified, and particular by its exact position in that whole, and because the wind is different and the soil is different and the juxtaposition of the grass is different at every spot, you get a simply wonderful incredible variety within such essentially simple order. Now this comes absolutely from the simple fact of the growth process that I just described.

What I am saying is actually obvious, and even within what you might call the fields of architecture and planning, or at any rate, within the practice of building, something similar to what I’ve just described has been going on for thousands of years. It’s as old as human history—except maybe for the last fifty or seventy-five years. And just to make that point obvious, again I’m sure you all know it, I’d like to show a short series of slides of places in Southern Italy which were made in a way very, very similar to the way that these grasses were made, but by human hands.

As far as I’m concerned, these things were worth doing. This garbage that we’re sitting in is not worth doing, very bluntly. And the problem is, what is the difference? Of course, there is a visible, obvious difference, all of us can feel the difference, we know the difference when we go to these two kinds of places, but can we make the difference clear enough so that we can actually choose to do that, and not this?

The first thing, which is quite clear and obvious, is that these buildings that I just showed you were like the grass, bit by bit, one building at a time, one roof at a time, one room at a time. A step was changed, somebody came out and planted a bush, somebody decided to put a bench right here against the wall, somebody came in and added a window—for years and years and all this thing was happening, it was a normal process of everyday life, and these wonderful buildings were made.

There is philosophical tradition in modern planning or American planning, which superficially sounds like what I just said, this is what is sometimes called piecemeal planning or ad hoc planning, sometimes even laissez faire—don’t do anything, everything will take care of itself, just small things, the market place, it’ll all work out. Now, the problem is that that kind of business has at least in some very slight degree, the character that it is made piece by piece over a long period of time, rather slowly, with a certain amount of attention. But of course, what is entirely missing from it, is the whole. Actions which just go forward, hundreds of them, thousands of them, day after day, uncoordinated in any deeper sense, will, very probably, create chaos of some sort. And so, in fright at this sort of chaos that’s been developing, the world of planning and architecture of the last 50 years, and especially the last 20, has become more and

more tyrannical, because people see what's going wrong, they see the cars are screwing up their neighborhoods, and they see that there is too much noise, they see that there is this and there is that, and they say, "We must have control, we must have order, we must have planning."

And that kind of planning, to some extent, leads to the same attitude in building—we must have urban design, in other words we must make a whole out of an area of say 10-15 blocks, we must have gigantic buildings such as this one or our own architecture building, so that there can be some sort of order, so the tyranny is getting worse and worse, people are getting more and more alienated. The reason for all this happening is that there is no clear insight about how to allow thousands, hundreds of thousands, millions of small acts gradually to create wonderful wholes. We don't know how to do that. As soon as we find out how to do it, we won't have to do all this tyranny, and we can tell the people who are doing it to stop, because we've got something better. So this is really the central, most urgent problem.

Actually, very little is known about it. I say "it" because this happens to be a problem which is very, very widespread. It is a fundamental problem in biology, but thoughts on this subject in biology, for example, are extremely primitive at this stage, even after several decades of thought about it. When I say "it", and talk about the same problem, what I mean is that a developing organism, an embryo for example, or in a plant that's growing, or in a person who is being healed over a period of time as the cells regenerate themselves, how is it that those cells continue to create order at the level of wholes, when the acts that are going on are millions of small acts? What is it that coordinates them? It certainly isn't tyrannical, there's nothing in the slightest degree tyrannical about that wonderful field of grass I just showed you, but somehow, there is a relatively large order emerging out of these millions of small acts.

I want to give you two or three tiny examples about this in the physical sciences to emphasize the fact that it is a general problem, not peculiar to architecture or planning, and also to underline the relatively primitive degree of understanding that exists about it.

This is a simple diagram of a crystal in the process of growth. Suppose that you have a crystal that is, in the way of molecules, let's say a piece of salt, are wanting to line themselves up in a roughly cubical array, take it for granted that the crystal ends up as a cube. But actually, why is that? This diagram makes the problem a little bit clearer. At any moment, as the molecules, or atoms, in this case, are placing themselves within the crystal ladders, the thing obviously is going to have a rough, irregular shape, like a lump Here are these things coming along, plonk, plonk, plonk, and it has this amorphous form. How is it going to end up as a cube? The reason is that this is a statistical process, it's happening in a solution, and here are all these little particles arriving on this lump, and the point is that in this position, this lump that tries to land up here, has only got some binding energy on one face, whereas a lump that lands up in a corner is being bound on two faces and is therefore much more likely to stay there. So therefore what's happening is that these lumps start to grow and fill in the corners and meanwhile the flat faces don't get extra excrescences on them, or at least that's much less probable. And therefore the crystal as a whole becomes a cube, even though it wouldn't if it were not for this very, very small scale process. This is an example where there is certainly nothing unsolved about it, I mean it is quite obvious.

I'm mentioning it because unless one happens to have thought about it, it is not clear that that large scale thing we called a crystal actually comes to be just because of the peculiar nature of that very small process whereby one extra particle gets added to that crystal. (...) give another example of the relative naivete of the kinds of things that have been done in the last couple of decades, this is just a mathematical game, one of many such games. I think this work was done by (...), where he just defines two or three rules of growth, they're purely abstract rules, and he shows that when you allow these rules to interact, a very small number of rules is already capable of generating relatively complex and organic-looking structures. I say organic (...) because this is a trivial thing, it hasn't any meaning. It is just the result of a game. But it's interesting that the general line of work done by these mathematicians to show how very,

very small number of rules interacting can produce a rather involved complexity. The biological case, the biological question, why do the cells grow in the right places so that the organs form themselves in a sensible way and so that the organism as a whole grows properly, there are many unknowns about it. The general central insight came from the work of a biologist named Spemann who discovered that there are essentially fields, chemical fields within the organism. In most cases these fields are created by certain centers, that is, specific actual physical points—throughout the organism, (...) but distributing out from these points, (...) chemical fields and the gradients of the amount of chemical that from different places controls the relative growth rates of the cells and thereby starts to create the large-scale order.

The reason I mention this case is that obviously what is most important about the biological examples is that the growth that's taking place is simultaneously creating these wholes but it is also adapted. That is, architects have, at various times, designed such things as the evolving house, or a system of components...where you can gradually build up a building over a period of years, in a certain specific manner, or at a slightly larger scale, traditional master plan is essentially doing the same thing. It is a map of a certain imaginary future, with the idea that the slots on that map are gradually going to be filled in, one at a time. This is a completely brittle conception of growth, where actually there is no genuine growth taking place in the sense that I'm speaking about it. The only thing that is happening is that the construction of a finished, completely tyrannized object is being phased.

Now that is quite a different process from the case where the end product is unknown in detail, and the small acts that go to make it up are coming one at a time, and each one is adapting to some local condition, and therefore is beginning to make everything just right. In the course of that adaptation, it may bend the blade of grass, it may twist the tree, it may make a really funny thing at the corner of a house, if it's in a traditional case where the streets meet in a strange way—all of these funny things happen, but still, the order of the whole is preserved. In other words, it is not the case of piecemeal growth creating chaos, it's piecemeal growth which is sufficiently guided by something so that it is simultaneously adapting locally all the time, and creating these wholes.

Now, I find myself in some ways in a difficult position as I'm explaining this because in one respect what I'm saying is so obvious, and in another respect I think I can say with a fair amount of certainty that many of you are not taking it seriously. What I mean by that is that, fine, yes, yes, this is happening in grasses and here and there, but what has it got to do with me? I'm an architect, I have to go to my drawing board and draw my building and get it built. And my difficulty this evening is to try and insist on the connection between these two matters. But I do want to make clear is that I am trying to urge you towards, which is the idea that a building, or a piece of a building, a piece of a neighborhood, will only come out right if it is happening in a way comparable to the examples that I have been talking about. Now I'll begin with the central part of what I'm going to speak about, that is, to give some examples of our recent work.

I'm going to give five examples of different projects that we have done, or are in progress, and I want to make it quite clear that I don't consider that we've solved these problems. I'm giving these examples as essentially just bits of things that we've done that are part of our struggle to create this kind of situation that I've been talking about. There are actually two different ways of getting this property that I've been speaking about. One of them has to do with the people who are living and working in the environment, and the other one has to do with the actual speed, that is, the slowness of the growth. I just want to make it clear why there are those two different things, which are both essentially facets of the same problem. This adaptation that was taking place in the grasses, or that was taking place in the Italian houses, is going on day after day, hour by hour, minute by minute. It is incredibly intricate, incredibly detailed. It's worthless if it isn't, but in order for it to be possible for it to be that intricate, only the people themselves can do it. I mean in other words, if every window sill and every door, and the seat and the position of the wall, and the exact place where the path goes because of a favorite rose bush, and all of those things are

really going to gradually get in the groove together, as the thing grows over time, obviously, the only people who can take care of that are the people who are right there all of the time. It is simply nonsense to imagine that somebody, one of us, can just draw up something in our office, some distance away, or even right there, for that matter, and then walk away from it and expect it to have these qualities.

It is a continual process, a life process, and for this reason, as some of you—at least those faces that I recognize—and I know some of you have spent a good deal of energy in the last few years trying to understand the processes by which people can do these things for themselves. Now in fact in that matter we have been rather successful. I'm not giving a lecture about that, so I'm not going to speak about it hardly at all. I think in terms of what I'm saying, it's enough to just briefly summarize the fact that it turns out that there are language-like systems in people's minds, that these language-like systems which we call pattern languages, are able to give anybody who knows very, very little about architecture as we professionally think about it, give anybody, the (...) to create buildings, part of buildings, for groups of people to create part of neighborhoods, (...) power is put right at their fingertips by the mere existence of such a language. Essentially, that language is playing a role like the role that the genetic material plays in the case of the grasses. In other words, the grasses, the reason they are coherent for all of their minute adaptations, is that they have genetic material in the cells which essentially is giving the rules of growth, and the rules of order, and all of these wonderful things are happening within these rules created by the genetic system. The human version of this is not passive like that, it's creative. The people who use pattern languages are creators, they're able to make things themselves, the things which have these kinds of properties. They're able to do it in the large, and they're able to do it in the small.

We spent a great deal of energy, the better part of eight or nine years in working out how that can be done and actually getting it to the point where it does work. The part of our work that is really new, and that is at the heart of this question, which is actually an open question to me, has to do with this question of speed.

So suppose that you do succeed in getting the creation of the environment into the hands of the people to a certain extent...I'll show you some examples in a minute of cases where we've done that. It is also not really going to work unless the thing is happening through time in the way that I said. And specifically, let me remind you of the (...) principle—namely, that the small acts are happening all the time, are not controlled, that is they are not intended to put things in pre-existing slots, the end product is unpredictable, and the question is, these small gradual acts are somehow together helping to build up these wholes.

Now the thing of this, the actual necessity, for example, of a building (...) like the architecture building, over a period of twenty years, not knowing at the beginning how it is going to be at the end, that's what I'm talking about. That's the kind of thing I'm talking about. I honestly don't know how to do this. I know enough about it so I think I'll be able to talk coherently for another half an hour, but I really don't know how to do that, and you'll see why. It's not a theoretical reason exactly, it has to do with a professional reason. There are professional difficulties (...)

Before coming to the implications for the profession, I'll just go straight-forwardly through five examples of current work and essentially just describe them as they go.

The first one is the University of Oregon. Just a brief introduction to it—the U of O invited us to do a master plan, we said no, we won't do a master plan, we don't want to make a drawing of your future, we will provide you with a process of the kind that I've been talking about tonight, in which people of the University, that is the students and faculty, can together design their own buildings for themselves and do it in such a way that the small acts by which they do it will gradually become coherent in the University as a whole. Let's just look at the pictures...

The first things that I'm going to show are actual sketches made by a group of people in the Department of Music, designing, together with us, an extension to the Music school in Oregon. I'll show you first just a series of pencil sketches that were actually made during the course of a week while we did this on the site up there. Then I'll show you a series of simulations of what might happen at the University of Oregon over the next thirty years if this sort of process continues.

One of the crucial points that I will come back to – I think I'd better just talk about this for a second. What you're going to see here...About the fact that this building was made by some of the faculty and students in the Music Department, using the pattern language out there on the site...the important thing, from the point of view of the theoretical difficulty that I posed, is that we have succeeded in defining certain sorts of fields similar to the fields that I mentioned are operating in the organism, and that these fields are essentially governing the large-scale order, also in terms of pattern, in such a way that the small buildings that are made actually not only contribute to themselves—that is are human, beautiful, appropriate, correct, whatever—they are also contributing to the large-scale order that seems to be needed in an emerging fashion in the University as whole.

Now in this particular slide (I was reminded of it because it says "University Street" up there) it happens that one of these field-like properties in the University as a whole had to do with the emergence of certain special kinds of streets which would be very, very connected to all those floors of the university buildings, with the idea of increasing the density of communication among the people in the university as much as possible. The diagnosis of the university in its present state shows fairly clearly where such phenomena exist already, where they're emerging, and where they don't exist at all. The existing building is roughly speaking that white, sort of L-shaped thing, and it happens that in this general area of the campus it was very obvious that there was no university street, nothing like it, and so therefore the emergence of such a street occupied the people who did this design while we were doing it, even though it was not of direct concern to the problem of the music school. What I'm saying is there was sort of a bargain being struck; there's a certain task, there's not enough space for the music school, and there's a whole series of patterns in a particular language for making that music school—which evolves in a way you'll see in a second—but the bargain that's struck is that in return for essentially having the privilege for doing this for themselves, the people of the music school agree that they will also take seriously the need for these larger structures to grow in the university.

So they will make an effort to have university streets appear or begin to appear in this particular part of the campus while they're going about their own business, putting in the wings of the buildings where they need them and making the building fit their own purposes. As this bargain, whereby small acts are made in such a way as to contribute to larger wholes, is very fundamental to the matters which I'm talking about, in fact it's absolutely essential to them; because it's exactly without that sort of bargain that you do not get large-scale order emerging. And then you really do get the kind of chaos produced by independent, unconnected, piecemeal acts.

I have so much material that I'm not going to try to explain exactly what was happening here. It's just that these are literally the sketches at day's end that were made on a series of days. This is the end of the second day. (next slide) By this time some fairly definite ideas had been formed about where to place practice studios and extra practice rooms and a new band room and so on. (next slide) At this stage the layout had fallen more or less completely into place and all the connecting links were clear. You see the shaded stuff is the new material, we (...) the old. And there is some modification going on in the old. (next slide) That was a detail about how one of the people there thought the practice rooms ought to be laid out. (next slide) That was more or less the conclusion, the end of a week's work. All day, for five days.

This building is waiting for funding, and what I want to show you now is a series of imaginary plans, which have to do with the campus as a whole, and the way in which it might grow over a series of thirty years under the impact of relatively small-scale actions of this kind. I say relatively small-scale, by the way, of course this is really pretty huge actually. It (...) as huge as current practice has it. The current practice at the University has buildings going up, typically they are in the \$3-4 million range, not that much different from this building, but this is probably a more expensive building than that. But the same sort of thing has been happening on this campus, these huge sort of bombs are getting dropped here and here and here and there. The very first thing we did when we started our work with them, was to say "Look the budgetary procedure has got to be changed." Because the sort of process that I am speaking about is fundamentally undermined so long as large acts of that sort are going on at all. Suppose that you have \$7 million to spend, or \$5 million, and most of it is blown on a \$5 million building, of course, you can't really do anything of the kind that I am talking about, and the essence of our budget—any recommendation to them which they, I think have taken with a pinch of salt is this: for every million dollar building or project, you have got simultaneously to build ten \$100,000 projects, a hundred \$10,000 projects, and a thousand \$1,000 projects. Think about that for a minute. That is what this process is really all about..

I would like to just dwell on that monetary aspect for a moment, because again, so far what I've said might be interpreted to mean that the money or the flow of capital into the environment is just going on rather slowly through time, instead of in relatively large pieces. But I'm actually saying more than that, and I think that those numbers that I just said make it clear—and that it is not enough to just do things gradually, the point is that you have to go back and do things again and again and again. Because you always make mistakes, so that if you spend \$100,000 on a certain building, you need ten or twenty doses of \$10,000 over a period of time, and fifty doses of \$1,000 over the next 10-15-20 years, to get that building into shape. It's pure fantasy to imagine that that thing that was made "bang" by somebody drawing a drawing and building it, could conceivably be any good, and that's true even if it was built without drawings and all that sort of thing. The fact is that the environment needs to be taken care of all the time, and in order to take care of it all the time, there's got to be money flowing into it all the time, rather than in these huge packets, which essentially deprive the environment of all the energy that it needs all the time to keep healthy and to keep this wonderful, subtle adaptation.

Let's just look at these next few slides for a moment. This is a series of four slides of plans of the University of Oregon at 10-year intervals in our imagination. This is the way it is right now. This is the music school building that I just showed you. Gradually small things are beginning to happen. Now of course, this is not a plan of the University ought to be in 1990. (...) they follow the procedure that we've laid out for them, and there is every indication that they will, with some minor reservations, there's a chance for a structure of this kind to emerge there. And given the fact that this thing started with a fairly regular grid and a few pretty large lumps sitting in it, you can see that even after a period of 30 years, this thing has begun to take on the kind of character that I'm speaking about. And of course this drawing does not show the actual things that would be going on locally, that would depend very much on matter that we have yet to come to.

So that is one example. The next example I'm going to give you actually doesn't have anything to do with growth at all. The reason I want to show it to you, though, is that in small degree an element of this same kind of process is at work in this next project. This is the clinic which is now under construction in Modesto. (next slide) I haven't got any photographs because it's not inhabited yet and there is no point in photographing it until it is. (series of 3 slides) The building is built in a conventional way. (next slide) That was the original sketch of it. The point is that as it's being built, it's being built all at once, \$600, \$800,000 building, it does not conform at all to the ideas that I am speaking about tonight. But the fact is that this was also (blank spot in tape) site, as the music school was, and just the sheer fact that it was designed by the people who were going to use it means that the level of differentiation in the building, the

amount of small, subtle adaptations, is very much higher than in a typical building that might have been built in this situation. In fact, the original building that was projected for this site was a concrete cube, and it was because of that that the psychiatrist in desperation started a process of investigations which finally led him to us, and ended with this.

But what I am saying is that if you'll try and imagine that at a particular moment, in the course of the evolution of this thing, here we all were walking around on the site and imagining to ourselves (...) comes in and you've checked in at the main entrance and reception point and you're then going through to the outpatient clinic, what happens as you walk around this corner, and here we are—you can imagine, five or six of us, walking around on the site, sort of structural marks on the ground, thinking that that building is already there, imagining what it's like to walk out of it, walk around the corner, sit down, and wait for somebody to come and do something... a simple process is simulated exactly the same as the adaptation which you'll make in the grasses or in the Italian buildings, except that there it's happening in time and here it was all happening in a very short period, as if it were for real. Very important difference, but still, there is a certain measure of value even in what we did, just because the adaptation is so much more subtle, relatively speaking, than in a building which you'd just dreamt up on a drawing board. This is no reflection on a person doing something on a drawing board. It just isn't possible for one man, without the reality of the situation, to get into all of these incredibly minute things—because you can't make them up out of nothing. Unless they're really happening to him, what's he to do, just push his pencil along these lines. The main thing to do, in a sense, the main point of everything I'm saying tonight, is to get yourself out of that situation. Don't allow yourself to be in that situation. Because as soon as you put yourself in a situation where real influences are capable of acting on the shape of the building together with you, that building will start to take on this very much more subtle and highly differentiated kind of adaptation.

(next slide) This is something considerably more ambitious, where we have not succeeded in (GAP IN TAPE)

We were asked to work on two tourist resorts, one in Spain and one in the Canary Islands, with very, very similar conditions. In one case as consultant to a Spanish architect (this is the work that I am going to show you) and in the other case, we were to have the opportunity to do what I am now going to describe. Unfortunately with the upheavals in Spain, I think that we are not going to be able to do that now. The gist of this project was to go very, very much further down the line that I have been talking about tonight. Actually, this would have been—or will be if it comes off—the first project where we're really doing the whole of what I have been talking about. The idea very, very roughly (I don't want to talk about the architectural and planning details except insofar as they bear on these matters)—the point is that this is a portion of a larger piece of land where a very considerable population of people from the Canary Islands, people from Spain and tourists were to be living and staying.

We approached this using the techniques involved in the pattern language and all of this. The ideas briefly were that it would be a situation where the tourists would themselves work for a small part of the day while they are there so that they are actually contributing in a real and active sense to the life of the community and not just consuming it. It would be a very, very high-density development, that is, roughly 400 beds to the hectare, for example, that is 200 beds to the acre. That is, extremely high density. Remember of course that people would be staying there for relatively short periods of time. We decided that there would be no cars in this development whatsoever. This is the coast line that you see here, this is the project in the Canary Islands. We imagined a road at the back, varying distances from the water, perhaps as low as 200 yards, running up to about 600 yards and no vehicles would be allowed off that road at all, except for service and construction vehicles.

The general pattern of growth would consist of a series of fingers going down to the water, but essentially

would come to certain special spots on the water or in the dunes (there are very beautiful dunes like the Sahara, coming down to the water here) and there would be no paths. There would be a continuous mass of courtyards, ranging in size from about 20 feet in the very tiniest ones, up to about 120 or more in the largest cases. So that there would be—you'll see in a moment in the drawing. The point that we are concerned with, this is real what we want to talk about here, is that we wanted this project to be generated by its own growth. That is, we were unwilling to specify anything [in] the form of a plan, in fact did so in this drawing, even, and in the one you'll see in a second, only because in this particular job where we were consulting with the Spanish architect, he essentially refused to accept what we were saying and said "Look, I must have drawings, I can't make sense of this otherwise." In a sense the drawings are valuable because they now show roughly the sort of thing that we have in mind. (next slide) You get some idea of the range of sizes of these courtyards (gap in tape) total site of a courtyard and the buildings around it.

I want to talk quite a bit about these two drawings, because we got into a very funny kind of a bind. We felt that the following thing is all that is really necessary. All that is really necessary is that you build the road, you identify the best spots at the water's edge, the spots where it is most natural for these (...) to come down. You do not even, at that stage, lay out the path leading from here to there: in fact, that is going to grow from the actions of people walking over the terrain, gradually discovering where is the best place to walk, where is a natural kind of incline, where is a place that happens to be a very nice place to stand and look at the sea, all of that. So we specifically did not want to draw those lines. We knew that we didn't know what we were doing when we drew those lines. The Spanish people also knew that they didn't know what they were doing, but they felt that they had to do it anyway. I'm making fun of that, in a sense, but it isn't all that funny, because this is the tragedy that is at the core of this whole matter.

So our proposal was, okay, you start with the (...) and with the spot down by the water's edge. Then people come in and they start to buy land. Now the people that are buying land (I didn't say, but included among the patterns here were, among other things, the necessity for a very large number of small, independently-owned-and-run inns, small enough so that the proprietor would be in contact with the people staying in [them]. There would be provision also for private houses and for somewhat larger hotels but in relatively small amounts. The idea was, as people want to buy land, they show up, they choose a particular piece of land that they like, the land is not subdivided ahead of time. They are then bound by certain ordinances which are part and parcel of this situation, to build in such a manner that the kind of courtyards that are needed to complete this complete pedestrian web of courtyards will emerge from their actions. It's not too difficult to imagine how that would be done, you put a restriction on the shapes of the pieces of land that people can buy, even though you are allowed (...), you put a restriction on where, roughly they can build within that land, you can insist that the some open space always be left in the middle and that buildings are always built to the edge; you insist, for example that every building is always built to touch another building, that you're not permitted to build a free-standing building. You insist that each courtyard be provided with connections to adjacent courtyards in the form of archways or openings through the buildings, and so forth.

You can imagine a very simple number of rules within which people can have a fantastic time and do the most unimaginable things, and yet the overall structure is still relatively ordered—but without the tyrannical kind of order entering into it. We imagine further that the most natural ways for these paths to occur, not only would people gradually discover the best places to walk and that the path would emerge simply from the number of people taking that path, and from the construction trucks, which are one of the things permitted, as they start to wind their way down here, but that it would be natural to define certain keypoints along these paths—let's say roughly for the sake of argument every 50 yards apart, 200 yards apart—whatever, there's a place where something special is indicated. You mark that spot and you essentially make something out of it so that growth will naturally start to happen around that place, and gradually these things could be built up.

There are some additional rules about density, that is, the relationship between density at different points in this overall structure. The rules that we envisaged were extremely simple. The planning law of the Canary Islands, which is essentially somewhat the Spanish planning law, I think, simply does not permit this. It's not that it doesn't permit it because of ill will, that may also be true, but the point is that it doesn't permit it because it's a very conventional sort of setup, in which it is necessary to have a subdivision plan, to have roads and paths marked ahead of time, to have open spaces marked, and so on and so forth.

So we got into a very extraordinary struggle with these people that we were collaborating with, because they kept saying, "Look, you must tell us where the paths are, where the parks are, where the subdivisions are, and so on," and it finally came to the absurd point where they insisted that we make a drawing of this type as a subdivision plan. I mean this in fact is the subdivision plan. The point is, we explained to them repeatedly, that it was not possible to make a sensible subdivision plan of this type, that this was really a simulation of the way in which these things would gradually place themselves, and that the essence of it was that people should be allowed to choose exactly where they wanted to place the building, exactly which piece of land they wanted to buy, as one goes. But it was impossible. So at the moment, this thing is now being put as a subdivision plan into a portion of this particular master plan, which is somewhat crazy. The hopeful thing is that in the other case, it may still happen in the south of Spain, I believe that we are actually going to be allowed to carry this out in full, without going through these hoops.

The next thing I want to describe to you very briefly is the content of a class I'm giving at the moment. I didn't describe in any detail... (gap in tape)... of the following type in the City of Berkeley. Namely, that any neighborhood of between 300 and 1000 people of that number of users, either people living or working in the area—a neighborhood 300 to 1000 people, relatively small, in other words a maximum diameter of about 400 yards. Really tiny. There are about 200 of these sorts of things in Berkeley (...) each of these neighborhoods has the right according to this ordinance we are working on, if it can diagnose its own area in such a way that it becomes clear what sorts of small acts of repair would help to start building in the larger-scale patterns that are missing from the environment, that the neighborhood would then be entitled to a share of the Berkeley city budget, specifically the part concerning capital construction, and that it would have the power of the board of adjustments and of the zoning ordinance, control over these matters in the area of its own concern.

What we're trying to show is that an ordinance of that kind which might give one of these tiny neighborhoods as much as say \$20,000 a year to play with, and the control over the private built investment, we're trying to show that in a fairly short time, maybe as little as ten years, under the impact of an ordinance like that, the whole city of Berkeley could essentially come to order in environmental terms. By people taking care, in millions of small ways, of matters which they're essentially not in a position to take care of today. They're not allowed to, they're not in the sense that the tax money is not permitted to be used for these purposes, and they don't have sufficient control over the private construction that's often expected to have these effects. The next slide is a drawing by one of the people in the course, showing diagnosis in similar terms—it's a very small area, you see, Hearst/Grove up to Shattuck at the end, a block and a half in that direction. House by house, if you were to see the drawing itself you would see that all over it small things are written in where the small acts of growth are needed in order to start bringing this neighborhood into order in terms of its large-scale patterns.

Finally, my last example – I'm going to describe something that was done in another course, which took place during most of last year, and concerns a very extraordinary finding that is really central to this whole matter than I've been speaking about. We began this course asking essentially the question, how could a group of householders, let's say a dozen families, design a dozen houses for themselves and the land between them. This was a matter that in purely physical terms we had investigated earlier (...) the techniques of the pattern language we've been able to show that people can create a world which has very

much more of the kind of richness that I have been speaking about—in a static sense, that is, as a design. In fact some of the people in the class where we first did that are sitting right here, I see several of them. I'll show you those drawings from that in a second.

We made a very extraordinary discovery about money (long gap in tape) to start, for a young couple to start with 350 sq. ft., and in the course of a number of years, in some cases seven years, ten years, to have a complete house, and essentially, at that point to stop paying. That means that instead of paying, let's say \$200 a month for 30 years, these people are paying \$200 a month for ten years—finish. And at that point, all of their income which is essentially what you might call housing income, or the amount of money that they are bringing to the environment, or are willing to bring to the environment, instead of having to pay off any interest, instead of having it be completely wasted in the form of bank payment could, if they wished, start to pay for the gradual repair and ongoing construction and reconstruction both of their immediate environment and the larger environment around them. I want to make clear that this is really quite a fundamental and central point. Because the whole construction industry at the moment is geared to the banking situation, in such a way that we have come to take it for granted that you build whole complete entire buildings, and we have come to take this for granted partly because the banks want it to be that way. This is not the only reason, because the fact is that we as architects and planners are also wanting it to be that way because of a whole lot of egocentric trips, which are very unfortunate, and I think can easily be set aside. But there are these two kinds of reasons which are at the moment creating these gigantic buildings which are taking the money that actually is needed to go on with this ongoing growth process, and wasting it.

I think at this point I want to wrap up anyway because I've been going on longer than I meant—it's fairly natural for me to kind of come back and summarize the question about—what is the implication of all of this for the profession? You can see that the examples that I've given are so far incredibly inadequate and partial. You can see roughly where they're headed, though. What does it mean to be an architect in the context of an attitude like that? What do you have to do, to be able to live like that, what do you have to do to your mind to be certain that you are still a creative powerful artist? What do you have to do in your profession to guarantee the client will actually be willing, to enter into contracts that are compatible with this kind of process?

I want to answer those two questions since I think the answers are quite simple. The first thing which I believe is vital—it sounds trivial, but I believe it is vital—is that the creative instinct of a person who nowadays calls himself an architect are actually being misled by the picture of architecture that we have. We have a picture in which it is necessary in order to fulfill yourself that you create these rather large things which are complete at the time of their conception. If you think back to the grass, think back to those flowers in the grass, think back to the Italian villages that I showed, and ask yourself, isn't it much more wonderful to be a person who is willing to set in motion processes that will create things like that? I mean if you can really anchor yourself in that fact, you will feel such creative power just at the mere possibility doing it, that the fact that it does not have the form of today's creative effort on large pieces of paper will simply not matter. Because you're really making something alive, you're capable of making something alive. But it does mean anchoring yourself in a process.

It means specifically that when you take on a building project, quite apart from working with the people who are to live and work there, quite apart from possibly moving more towards the construction of the building and not being a purely abstract architect—I haven't spoken about that tonight, I haven't had time—this is also very much part of the same matter, to move towards the construction of the building—quite apart from that there is the simple thing that you say, look, I want to build this building over ten years. Now it sounds crazy today, but it's not crazy. And it's possible that all of us could essentially get into the frame of mind where that is what we would do as a matter of course. Because we know that it's better for the environment. And, very important, it also happens to have this strange connection to the

monetary aspect.

Let me just give a concrete example. A couple of years ago, two or three years ago, I was asked to make some rough, some schematic designs for an extension of the Berkeley City Hall, which—at that time, really, these thoughts that I've been describing tonight were completely unclear to me. So just went about this, did my best, using various techniques, and so forth... anyway, of course it has not materialized because it's not the right thing to do with the money anyway. But there they are in the position now of wanting in order to satisfy the city service a \$2 million building. Now what I realize today is the following: in order to get a \$2 million building they were willing to pay \$200,000 a year for 30 years, because that was the rate of amortization. Because they essentially had access to \$200,000 a year. What I would say to them today is build a \$200,000 extension every year, once a year, for ten years, and at the end of ten years you will have that building, it will be infinitely better, because it will be far more grounded in the realities, and you will have saved \$4 million.

And that's true, it's actually true. It sounds incredible because architects are not usually in the habit of thinking about these things, but that is actually true. (comment from audience) I think it's very important to discuss the subject of inflation. In fact, the present attitude for that money is precisely what is behind the phenomena of inflation, and it is of course very easy then to say, wait a minute, this isn't compatible with the inflation thing.

Let me just sum up. In the last few years, I have more or less discovered how to get a fairly serious kind of thing happening in which the users of buildings take part in their designs in such a way that the very highly differentiated character of more traditional environments actually comes into being. That part, at least, seems relatively clear. This other part, what I have been speaking about tonight, is not clear. I grant you that freely.

I don't know exactly what to do. What I have just been suggesting, for instance, that one try to persuade one's client to set up contracts of that sort, that one enter into altogether different agreements with the people with whom one is making buildings, in such a way that the buildings can be built gradually under the guarantee that the large-scale order will emerge because of the fields or other diagnoses which I again grant you are not completely clear at this point—but that is our real task at this moment in the evolution of our work. To persuade people who are paying for the buildings that this is what they should pay for, and on our own part, to refuse to enter into those kind of situations where we are making these absurd and gigantic cardboard blocks.

I will put this in very straightforward language: I think any one of you who is a student in this school is in a position where if a design project comes up, and somebody says to you, Hey, listen, the design project for this class is to do urban design on this and this scale, and you realize that some gigantic cardboard model is going to be the outcome of it, essentially a huge urban design or a gigantic building or set of drawings, you can refuse.