

Now we are, \_ I am getting tired of people coming in late. What time is it. We will wait.

Today I am going to present a slightly more realistic account of the sequence of operations that somebody goes through when he makes use of a series of patterns. Slightly ~~more~~ more realistic than the algorithm. And in the course of this ~~we~~ we will see the fundamental reason why the algorithm ~~breaks~~ down. I want to make it quite clear today that the material I am presenting today and the next time and the time after that is in a very very tentative kind of shape. So that I am really going to be ~~talk~~ talking around some problems ~~x~~ rather than presenting conclusions to you and I am going to talk for a very short time for that reason and hope that we can ~~dis~~ discuss the issues.

Now what I am going to say today - I am still making the assumption as I did last time that we have somehow got a set of patterns out of the language ~~we~~ to work with. In other words I am not getting into the question of how do you a ~~set~~ of patterns that is appropriate to a particular problem. The supposition is that you ~~somehow~~ ~~somehow~~ somehow have a set and what do you do with it. Now in order to ~~study~~ study this three of us sat ~~down~~ down a couple ~~of~~ of weeks ago with the house entrance patterns each one of us took a different situation - a different real situation and then we asked . We asked ourselves if we take an intuitive approach we have these 26 patterns and we want to make an entrance in this situation which would have all those patterns in it. What would this process look like. What kind of sequences are in it? Can we identify what the most most reasonable and natural way of doing this . The three situations ~~x~~ that we took were the following:

One of them was assumed to be a 30 ft lot. assumed to be attached to a 30 ft row house And that was extremely general the assumption was that the house there was being designed and the design of the entrance was just one part of that general design task. The other two situations ~~x~~ were referred to existing buildings- existing houses. In one case a house . Let get ~~the~~ these three cases clear. On the one hand we have got this 30ft lot to contend with and we know it is an attached house the ~~a~~ whole house is to be designed. And the second an existing situation. The corner lot with a large two story house standing on it considerable amount of unfenced yard on this side slightly ~~less~~ less on that side,



An entrance a door already existing to this house at this point in the form of a slightly enclosed ~~porch~~ porch. A ~~staircase~~ staircase leading up there and inside of this house approximately living areas here kitchen back here. I am not going to tolerate people coming in this late anymore. ~~The~~ The kitchen is in the back in this case the living areas are up front. The assumption here is that this whole house which is at present divided into apartments one at ground floor and one up ~~sat~~ stairs is going to be reconstituted as a house and there is interest in assigning the car positions and the whole organization ~~of~~ of the entrance in redoing that. So that is the second case.

The ~~third~~ third case is one where there is a lot and an existing suburban house on that lot with a ~~kind~~ kind of living organization like that bedroom, kitchen, dining room <sup>livingroom</sup> /up there a staircase here going down to the basement and a large ~~front~~ front yard. There is an existing door but that was not part of the problem. The assumption was that given that house ~~people~~ people are not satisfied with their ~~entrance~~ entrance and they want to reorganize it so this is a similar problem for this one. Now I want to get to the discussion fast I am not going to go into the details of what happened here. I will just sketch rapidly a the kind of solutions that were arrived at and we will discuss ~~very~~ very quickly ~~a~~ something about the sequence. In the case of this house here the first kinds of things that had to be done were this position of the car port with respect to an entrance and kitchen and living room. All those things have to be located and that gives you a broad kind of organization to it and we ~~were~~ ended up with the following. This is the lot/line here, In this case ~~the~~ the car - part of the information ~~in~~ in this case was that there were 2 cars to be dealt with. The carport in a place like that - each edge of the carport comes back like that so that the cars can ~~sq~~ swing in this way. The - this is a kind of court the roof of these carports continues up the sides of this but not down the middle there is a slight bit of roof up there. The living room - this livingroom light by a clear story from above the car port. The - there are windows opening out on to that area as specified I presume in trying to understand these things you will refer back to your notes about all these patterns. There is a wall straight ahead of the doof and the circulation split the childrens rooms and all that stuff is going ~~to~~ to be back there. Now what is important is



is that in the process of laying this thing out we have to distinguish between three possible approaches. One approach says you take one pattern at a time in some kind of linear sequence and try to deal with it. This is one possible alternative.

The second possible alternative is that you take all the patterns at once which was in a sense what we tried to do as we were doing these examples. In this case it happens to be 26 or something short of 26 it might be larger.

The <sup>ir</sup>third alternative is that the patterns come in small bundles and the although you are not going in a linear order from ~~xp~~ pattern to pattern within the bundle you are progressing in a reasonable linear way from bundle to bundle. The strict linear sequence, the first alternative is the closest to the algorithm in spirit. Now what I want to do is - I am first going to describe what happens in this example. First thing I want to do is dispose of the possibility in a ~~xxxx xxxxx~~ strict linear order. If there were a universal algorithm it would be clear that one of the first things you have to do is locate the position of the cars that was certainly the case in this example and in fact it was necessary because the extreme narrowness of the lot made it critical and the very very first thing that one had to think about in trying to lay this thing out was how do you put 2 cars here and still maintain a part which goes ~~xx~~ straight to the front door a visible front door, a ~~xxxxxxxx~~ situation where the cars open into - are not too close side by side - remember that pattern. So this ~~x~~ - the position of the cars is a crucial feature and if one were taking the algorithmic kind of approach it is pretty clear that that would be one of the first things at least in this kind of case that one would deal with. Now in this case we happen to set it up so that there were 3 cars had to be accommodated a three car port. This is ~~a~~ is ~~agaf~~ aggravated by the fact that that whole thing is several feet ~~xxx~~ above the ground what is it 5 ft or 6 ft above the ground there are so that/~~xxx~~ steps leading up to this. The solution that began to emerge was one in which goodbye the whole/~~xx~~ porch and kind of entrance/court that was under surveillance of the ~~x~~ living-room was in that position and the carport were directed toward that thing in this kind of manner. Now it has raised extreme difficulties - let me just anticipate them because this thing was 6 ft above the ground level it meant that ~~xxx~~ there had to be steps leading



up to this in a number of different positions in order to be compatible with that pattern for the goodbye porch ~~x~~ and in position in respect to cars. In ~~ob~~ other words they ~~wxxx~~ were finally placed one stair here, one stair here and one stair here and it seemed - this is obviously a very expensive solution and not one that really works out so in some sense that pattern was not well thought out for a situation with this setting and it would be nice ~~x~~ to say that the context was wrong. I am not quite sure of how to cope with the fact that we deliberately sat up an extreme situation and the patterns began to break down rather radically also the storage pattern which as you remember calls for a storage area immediately outside the door and immediately inside the door becomes pretty senseless when you have got to go up a flight of stairs before you get to it so that that one seems more clear the pattern that I gave you would simply have to have in its context statement that the thing is at ground level but any way that is all degeneration. The fact is that here again one of the first things that one was trying to do was to locate the car with respect to this main porch court ~~bs~~ thing so that since we have got this far it seemed quite ~~good~~ plausible that maybe there was an agarithmic approach to this namely the very first thing you have to do is organize the position of the cars with respect to the position of the door and then further details of the design will unfold ~~and~~ in accordance with other patterns. Now before I explain why that isn't true with this third example I should like to draw attention to 2 facts that are both suggestive ~~on~~ both also indicate something about the validity of this strictly sequential process. One of them is ~~x~~ that if we look at traditional cultures where we are fairly sure that languages are operating in some sense and ask in what form is the know-how about how to build a certain building being coded that is what do the people possess strictly speaking. We find that at least in some cases the way they define the language is that they have a certain sequence of operations which must be ~~per~~ performed in order ~~x~~ to construct the right kind of objects.. Just for instance I have seen a paper describing the sequence of operations that a marquisian canoe builder goes through to build a correct canoe and this is quite



strictly sequential it starts out first find your tree and it then takes you through every single step the things that you have to do to that tree ~~before~~ so that you finally come out with a properly build canoe . I also know a case like that in Africa among the Bemba where they have - well it is recorded in almost the form of a chant or a poem and this one builds with to build a hut. you do such and such and then it begins to tell you the steps you must go through to build a hut so there is something very real about this sequential thing and the second suggestive item and this is no more than suggestive is the fact that in embryonic development you do have - well you have a very very complex form ~~begin~~ being built up - you start with the embryo in the first stages of its development it has ~~in the beginning~~ almost no organization at the very very beginning the first thing it gets established is an axes.. The next thing that gets established is the slight differentiation of three - the inside the middle and the outside of the organism then the head gets ~~differentiated~~ differentiated, then the spinal column gets put in and these things- although each one of them is relativistic in that sense you are not taking a detail and doing that you are doing something to the whole thing but it is of course sequential and one is ~~complex~~ capable of getting a very very complex organization out of it and this I think corresponds and I mention it because it does correspond cognitively to the way that design sometimes feels that is when you are designing a building you start out by laying a very very broad features of the organization and then you gradually fill in more and more ~~detail~~ detail so what these things suggest is that there is something strongly ~~sequential~~ sequential needed in making use of the language and substantially producing a design and here in these cases at least we found that you start off trying to make the same relationship that is the crucial ones ~~to making the~~ connecting the cars to the doors. In this case there was also the freedom to try and develop simultaneously the ~~relationship~~ relationship between the cars and the living room and the kitchen in this case since the kitchen was already fixed there was nothing about the patterns that could be done so obviously those patterns had to be ~~ignored~~ ignored. Now here we ran into something different the person who was trying to do this began with the same idea like it seemed that the first thing to do was to put down the positions of the cars but notice, let me just draw this in in a little



little more detail. I think there is a screen there if I remember correctly bedrooms out there. What we have here is a cordor with a kitchen there ~~xxxxxxxxxxxxxxxx~~, a diningroom there and a livingroom here and as she began to locate again the same thing ~~here~~ in this case - it is presumed to be a 2 car situation it became obvious that there is a crucial issue about just precisely ~~where~~ where to put the door and all this because if the door was here it would be very inconvenient to get into the livingroom and infact it would almost certainly violate the patterns that call for a non-visibility of the kitchen for somebody that is going into the living room. Whereas on the other hand if the door were here this would be very very inconvenient for the kitchen and would also tend to violate these areas that are open inside the house. Im sorry I haven't drawn that very clearly they are more open than I have drawn them. They would tend to ~~xxxxxxx~~ violate the patterns which state that you cannot see from the doorstep into any places - any rooms but although she began by trying to locate those things it then became clear that what had to be done was to find a position for the entrance which ~~xxxx~~ would take care of the relationship between the entrance, the non-visibility of the kitchen the blind ness of the door position itself that you couldn't see into the house and the ~~whole~~ whole collection of issues. Call it a collection loosely for the moment. It was aggravated by the presence of the stair case because it seemed to indicate that you had to go there or here and neither of them were very good.. Remember also there is the problem of being able to lookout from these rooms onto the place ~~where~~ where people are arriving. After this we are going to discuss for a little bit that it became obvious that it was possible to locate an entrance over the lower end of the stair case that this well had been cut to the - and part of it could be floored over and that a door in this position would be possible to arrange baffles in such a way as to put a blind wall there that atleast some of the characteristics called for could be obtained. At that point then all of this stuff began to organize itself around the position of that door. Now what I am ~~now~~ drawing attention to here is the fact that is very familiar to any designer but we have to be aware of it formally and that is that according to the situation that you are in the particular features of the pattern that



you try to lie down first will change. In this case because of the tightness of the sight made the ~~position~~ position of the cars the most critical those were the patterns that had to be dealt with ~~first~~ first ~~x~~ in this case the small collection of patterns dealing with the blindness of the living room and blindness of the livingroom and the blindness of the kitchen were the ones that had to be dealt with first. ~~k~~ This is, I am only explaining it quite quickly but this is the reason that the algamerythmeic approach breaks down is that although it is capable of producing organization for a very restricted range of real situations in other ~~words~~ ~~s~~ words that algarythem I gave for campuses could work on any reasonably virgin site without too much ~~conflicting~~ conflicting it but the moment you get into the realities of real things being in fixed real places and special demands that a client has lets say the various patterns that are at work have got to be reordered in a way that is appropriate to a specific case. Now as I say every designer is aware ~~x~~ of this. The question arises is there anything that a language can do at all because ~~x~~ one might after reaching this conclusion one might very easily take the step and say look there seems there is a linear approach ~~xx~~ pattern by pattern hopefully ~~xx~~ why not just take all the patterns all at once which was the second alternative that I described now the answer to that is two fold really. First of all there are functional reasons metigating against it for instance when you just take an eyeball approach to the material there are real limits to what you can handle ~~x~~ cognitively in this case we have got these 26 patterns and already it turned out that in this case by the time I got to the end of it I had acually taken care of every pattern but ~~xx~~ finally it turned out that storage now for instance the storage outside was allright it could be under there. But there was no with this organization the whole issue of storage was ~~xxx~~ very tricky. There was no natural place to put the storage on the inside of this door. That just happened to be the thing that went wrong in this case. The moment that you get upwards of ~~xx~~ probably 15 to 20 patterns. I don't know the exact number, you are going to be running into things like this. You statt losing patterns and the trouble is you get so far with the organization



virtually impossible, impossible psychologically if not literally to go back and start again and so you say just screw it you say forget that one. So this is the real difficulty of taking all the patterns in parallel see I don't think we are equipped to be able to do that and I want to draw attention to the fact that this is going to get very much worse when we talk about 100 or 200 patterns. Now the second reason against trying to do it like that all in parallel is that this really isn't a reason for not doing it but it is a reason for believing it is not necessary for doing it. Even though in these three cases as I have shown you the sequence that was natural was not quite the same there were nevertheless clumps of patterns that were always dealt with together. I give you the numbers of these clumps in terms of the numbers that you have so that you can look back over it. One of them which has to do with this whole organization of the car with respect to the door with respect to this thing that has to be overlooked by livingroom and kitchen and the straightness - the directness of the door as seen from the street - ~~gh~~ those - that involves patterns 3, 4, 6, 7 and 9. The problem of not seeing into the kitchen of having a dead end at the door of not seeing into the house in general for someone who is standing on the doorstep and of being able to see someone who is standing on the doorstep as you come to the door those are patterns 10, 19, 23, and 25. The patterns that deal with the issue of shelter that is the continuity of this roof and the location of the railing and whatever it was in the goodbye porch ~~porch~~ porch those patterns are 14, 16 and 17 and the fourth clump that I am going to give you here has to do with the issues ~~ha~~ immediately surrounding the construction of this door and those are - you remember the door shelf which is 18 the business of being able to move ~~furniture~~ furniture in which says that there must not be any walls going vertically out from the door at 21 and the width of the door which is 22, possibly one might include storage in there I am not sure now the ~~xxx~~ thing is that those 4 clumps were used by all three of us more or less integrally it is true that the order of use of these 4 clumps change but - I mean in the most obvious ~~cases~~ cases the one the second clump that I just gave you came first in this process it was the other way around here. Now I would like to leave it at that for this morning and quickly get into



some discussion as to whether it is reasonable that - how helpful that it is that a language would be giving you clumps of patterns to deal with how important that the language should give you the ~~language~~ ~~to~~ order in which to use the clumps or is it more sensible to leave it up to your own feeling for the situation and your grasp of it and on what basis are these clumps defined. I mean I have just happened to name them and so far is empirically they came out with always dealing with those patterns together. Is there any formal property that ~~that~~ those clusters of patterns have that make them clustered. I would like to start the discussion right from that point ~~at~~ now.

Question:

REply: Right. I am not even sure that the language ~~is~~ is capable of telling you in advance what is going to be the most critical. I really don't know that. It seems that it would be helpful. I mean we have got to come to some conclusions about how can a language be most helpful I have tried to indicate that the strictly sequential approach is not helpful but it is also not helpful to take a perfectly parallel approach so that we are looking for something inbetween. Now is it helpful enough if the language simply tells you what the clumps are and leaves it up to you to decide what is the most critical in a given case.

Question:

REply: NO that isn't true. BEcause for instance - that is a very important observation but it is not true. In - you see in the biggest clump that deals with the positions of the cars with respect to the door - with respect to these two rooms and this is really sort of like one of those very very early stages in the embryo where the main things are being placed and actually that <sup>not</sup> local - it is true that all the other little clumps that I mentioned happen to be local but there is nothing like one of them deals with this area and those relationships and one of them deals with these kinds of relationships so they are <sup>sort</sup> kind of localized - some of them but don't make the mistake of thinking that each one deals with some part of the design because some of them are going to be global and deal with sort of the reaches of the whole thing.\*

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Question:

Reply: I'm just trying to think about it - ya, I get an inkling of it. ~~XXXX~~ Could you try and rephrase what he said?

It's an interesting point and I don't want to lose it.

Well, I do think that the best clue to these clumps is that - is something based on the hook-up relation. For instance, it seems clear that the major patterns which are at stake here. Let's talk about that very global one for a minute. One of them is ~~xxxxxxxx~~ relating path positions to the door - another one is relating car positions to path positions - another one is relating car positions to that thing. Another one is relating that thing, ~~xxx~~ to kitchen-living room, so that you have this web of hooks - it could be and I just haven't looked at it closely enough yet, that these natural lumps are the ones that have the densest kind of - I mean the densest amount of identity, between parts. If your interested in looking up something that's suggestive of that there's a paper that's called Relational Complexes in Rapid Transit Stations (in Architecture??) where was that now - several of us wrote about a year ago in Architectural Record which - now these relational complexes that are described there are pretty much like these clusters of patterns. They are actually defined by the amount of parts in common that are shared by a small set of patterns. That was based on the assumption that that idea made sense - that one had parts and that therefore there could be parts in common. It seems to be twisted slightly now to make it consistent with what I told you the other day about memory. But, that seems the most promising. I'm frankly a little leary of it ~~x~~ only because it's so similar to what I described in Notes which is again an issue of where you have a number of things and where your looking at the densess bundles of linkage. I'm a little leary that this might just be a habit of thought of mine rather than the truth ~~xx~~ about this situation. So it needs some pretty tough minded examination.



Question: Global action ----- micro action pattern of people trying to get in out doorway -- then sort of static action seeing out not being able to see in

Reply: Very interesting actually - that's an interesting idea - that's a nice word too. I think it will be worth while as you build your own patterns to look for things like this and to see - please try not to prejudge the issue - in other words, I'm quite uncertain about it - so don't assume that there are going to be things like that that are going to make sense. But try and look for the ways in which it would be natural to use the sets of patterns that you've made and see whether there are any useful sets like this that crop up.

Question:

Reply: Are you saying that you pick - that that first set forms a set because it provides the context then for some of the patterns that fall into some of the other sets? There is obviously something like that going on - the trouble is that this business puts sort of a cloud on that because that remember what we're doing here is laying that down first, and it isn't true that that stuff is the context for this stuff. Not in the strict sense of context that we're using within the patterns. So that - of course it is see - that's very tricky actually. It is true that the whole house is part of the context for a number of these large patterns. The way in which one really uses the context is also unclear to me and I'm going to try and discuss it on Monday - as much as we know about it. I don't know how it relates to this issue about these clusters. I suspect your right but it must be somehow.

Question:

Reply: Yes. Now your raising an important issue - I've glossed over it. Of course it's quite possible that some of the stuff referring to the internal organization of this house would ~~inxxx~~ invalidate some of this material. I mean there's no doubt about that. I can't - well, for instance, one of the cases I glibly said that this is clear story lighting. And I didn't say anything about how far this living room extends back, or whether there's any windows on the far side of it or what. But it's obvious that that could easily run you into a lot of trouble depending



on what is called for in the way of windows for living rooms and there could be much more serious things than that also.

No, I have no argument with that - let's try and develop the point though. It does raise in a very interesting way the question suppose you were starting this whole house from nothing except the given that you have a lot that is 30 feet wide - and I suppose some depth. At what point would it be relevant to bring this stuff into play. It also raises the question which I doubt by the way, I mean its possible that as well as I've described four little clusters that all of the entrance material forms a big cluster which would be dealt with at once in the manner that I've done that here. Now I suspect that that's likely to be wrong. In other words when you were starting to take in to account all the various things ~~x~~ that are going on here, it seems more likely that you'd be better off with the individual clusters that I've developed - I mean that I just described to you - and that there ~~wxx~~ wouldn't be any moment ~~thxxx~~ at which you said now ~~wxx~~ we're going to do the entrance. See what I'm saying there - I suspect that - I mean that sounds wrong. I'd like to - see if I can sketch it out --

Well, there's another question. I'll simply pose it as a question for you. As I just defined these clusters - and I defined them in a kind of absolute way - I said look - we found those four clusters cropping up in ~~x~~ each of our projects - now, note that because of the various conditions we did not all make use of all twenty six - I keep saying 26 - I've ~~xxxxx~~ forgotten that there are some blanks in there but I'll just use the word 26 - we didn't all make use of all 26. Now this project I tried to make use of all of them and failed with one. In this project there were a certain number of them that were necessarily excluded from the very outset because the location of this kitchen was given. Also it was impossible - given the fact that there were going to be three cars on the lot and the amount of space that was available here - it was not possible - it really has nothing to do with the cars



but the fact that the lot was this shape it made it quite clear that you were not going to be able to put any sorts of ~~xxxx~~ <sup>paths</sup> ~~or~~ or doors in such a way that you could see the doors from the corner of the lot. So in that pattern the extreme version also had to be abandon obviously although there was an attempt made to get near to it. In this case, I can't remember what had to be abandon - can you remember Murray what had to be abandon here - of yes, obviously the kitchen was unable to - because of ~~xxxx~~ its position at the back was unable to have a window on the entrance court. So that actually we're talking in each of these cases about some subset of the 26. In this case it happens to be the fourth ~~subset~~ subset, in these two cases it's only some of them.

Now the question arises - are the clusters permanently defined or are they a function of the particular subset that is relevant to your problem. Is it clear what I'm saying there? I mean there's the distinct possibility that given 26 things you get certain clusters but that taking 25 of those or 24 of them they actually reshape so it's not just a matter of having the same clusters with one or two things left out but the clusters which are appropriate to that set of patterns are not the same as the clusters that are appropriate to that set. Now I haven't mentioned that at all - I just don't know the answer. It seems nicer - I mean it would be - I feel its more promising that that should be true. Just because the other thing has a sort of ~~xxxxxx~~ rigid quality which is sort of unlikely.

Question:

Reply: Well, now wait. They are all related in the sense that if you look at the context statement on the individual patterns that I've given you, ~~x~~ they do apply to all of these three situations. --- Well, they may be wrong yes. Well, in fact one of the things that seems a good indication of that - as I mentioned the storage here was fouled up and these stairs also had a sort of unlikeliness about them even though as a result of this thing being high it had some very nice qualities. But



I'm not - look your quite right. We have to discuss how - when you define a situation like in this case you actually have a house on a lot - or in this case you just have the fact that you've got a 30 foot lot to deal with and you've got certain demands on it. How do you get to the set of patterns which is relevant to that. I mean that question we have got to deal with. And if your saying that that might shed some light on the nature of these clusters - it's possible, it's possible. One of the difficulties - one of the questions ~~xxx~~ we're going to face is assuming that you do have some sort of description of the setting - as we had three here - does that define the entire set of patterns that is relevant to that setting and does one then start ~~xxx~~ asking how to use that entire set or is that impossible because what actually has to happen is that it defines some of the patterns which are relevant and some of the other patterns which are relevant doesn't get determined ~~x~~ until you've started to use some of these. That could easily happen. Precisely because some of these other patterns will be context dependent and the presente of absence of relevant context ~~xxx~~ won't be known until you've made use of a few initial patterns. So the questions are tied together. That is on the one hand given a set how do you use it - do you try to break it into clusters - do you try to impose a sequence ~~x~~ upon on these clusters, etc. There's that question on the one hand and the other question is how do you get the whole set of patterns out of the language which is relevant to a given case. I'm talking about them separately but they are very much part and particle of the same thing.

Question:

Reply: No, this is what we're going to discuss ~~xx~~ ~~x~~ next time. I would like you - your now due to come up with another critical discussion for Monday, and I'd like instead of just critizing what I've said - I'd like you at this point to say something constructive about ~~xx~~ the question which we've just been discussing. I thing this is the first opportunity where you really have a chance to try and make some in rodds.