

Today, I'm going to describe conditions - five conditions that are required for the validity of a pattern. Big pattern, right. There are, strictly speaking, three conditions concerned with empirical validity and two conditions concerned with usefulness as elements of a language. Let me just say a word of introduction. In the format which I described last time, one could write down almost anything. That is, for instance, you could pick the exact geometric relationship of that light there to this blackboard and get the angle and the distance and say that that was a pattern in the context of the lecture room and that pattern solves the problem of illuminating the blackboard. So in other words, its quite clear that this is - I want to make up also entirely ~~x~~ ~~xx~~ absurd patterns - that particular one is pretty absurd. So we have to set up ~~x~~ some conditions that will restrict the things that we're allow to write down as patterns to those that are really sensible.

Now, I'm going to read these out because its important that you should have them down exactly. & As a matter of notation, we'll use ~~xhax~~ capital letters like these for the big pattern - the whole pattern - and distinguish between sections we will write context P - Pattern P - and Problem P and that~~x~~ refers to the sections I described last time.

Now the three conditions for validity are these. The first two are rather trivial - the thing is in the third one. One is in the situation described by context P the Problem P occurs as stated and it can be shown that it needs to be solved. Conditions two is in the situation consisting of context P, plus Patter P ~~xxxx~~ that is is the entire spatial organization described by both of those together, Problem P is solved. ; In the situation consisting of Context P plus Pattern P the Problem P is solved. Condition three, is a little longer. It has two sentences. The situation defined by Context P, plus Pattern P, gives rise to many other problems besides the Problem P ~~and~~ which Pattern P is specifically designed to solve. ~~Thxxxxxxxxxxxx~~



All these other problems can be solved within the context P, without changing Pattern P. Those last three words are underlined. Now, condition four - we're now dealing with the two usefulness conditions four and five have to do with usefulness. And it says: Suppose that P is broken into two sub-patterns Q and R. Each solving a sub-problem of Problem P, namely problem Q and Problem R. There exists no context where problem Q occurs without problem R. Condition five: says: Given context P and Problem P there exists no solution to this problem in this context which is not included among the alternatives defined by Pattern P. Now, I'll just go over them, so that you do have them right and then we'll talk about them informally.

I want to get very clear is that suppose - let's put ourselves in the position where we have constructed something that we think is a reasonable pattern. And it has the three sections, Context, Pattern, and Problem. Then it is an empirical matter as to whether or not each one of these five conditions hold. It is an empirical matter that is very very important. And establishing that is going to be quite crucial to everything that follows. Because if it isn't empirical matter than the validity of a pattern, though it may be in doubt, is always subject to investigation. And it means that there is the hope ~~xxxx~~ of that kind of convergents among different investigators so that they can come to agree about the validity of a particular pattern. So these five conditions are empirical. I don't want to minimize the difficulty of establishing them - of establishing whether or not they hold. That is extremely difficult except in trivial cases it's fantastically difficult. But it is an empirical matter and one of the most difficult habit obstacles that a designer will have to overcome in trying to express his ideas in this form, is that he must write down the content of his pattern in such a way so that what is said really is subject to investigation. In other words, it's possible to write things down in such a way so that it's not quite - the - let's say your statement of a problem might be stated in



such a way that it is not clearly subject to empirical investigation and this is going to be a major struggle, I think. I'd like to just throw in the fact that now, as we go through it - last time I gave an example - today I'm going to discuss these conditions - in the next two lectures I'm going to give more examples. I would like all of you to begin constructing patterns. If you don't understand what is being said here ~~and~~, then that's all the more reason to try and construct a pattern, so that you bring out exactly the area of your misunderstanding or disagreements. So, I want you all to start doing that and I expect that in the things you hand in from today on, you will make your critical comments with actual patterns that you have invented or have abstracted from some other source and use those as examples then we'll get to grips with the ideas.

Conditions one and two, I can not describe - as I say they are slightly - a little on the ~~g~~ trivial side, but I can't - I won't be able to do them complete justice this morning. In order to decide whether or not a problem occurs in a specific context and ~~xxx~~ whether or not a particular pattern solves such a problem, we've got to have a very very accurate definition of what a problem is. Now, I've chosen to postpone that - I feel that this ~~xxxx~~ order of presentation makes more sense. So, I'll only be ~~xx~~ able to give you a beginning of an idea about that, and ~~x~~ we'll come to exact definitions in the week following.

Now, let's take for instance the pattern which I described last time. The context is a house, as I stated a free standing house, standing on a street where vehicles are moving between 5 and ~~x~~ 30 miles per hour. Now, the issue is, is it true that drivers are having trouble reading signs that are more than 10 degrees off the line of the road. If you remember that this was one of the assertions made in the whole statement of the problem. Now, that assertion is an empirical assertion and as I told you ~~x~~ last time in that particular detailed case there is evidence that is indeed 10 degrees which is the right figure. In the silly example that I just gave about this - saying that



one could make up a kind of screwy pattern - talking about that light and the illumination of the blackboard. You could say of course that in the context of a lecture hall the problem of illuminating the blackboard arises - or given a lecture hall with a blackboard - that's a pretty weak statement - what you'd want to do - to get empirical evidence - for the amount of illumination that's needed on the blackboard - that's quite simple and can be obtained without too much difficulty.

Maybe minor disagreements about the exact range of values. So as I say, this is relatively trivial and obvious that this must be established. Now, in some cases, it's not quite so trivial. The example I'm going to give next time concerns the pattern describing the arrangement of streets in a metropolitan area and in the construction of that pattern, one of the crucial assertions in the one statement of the problem that I'll present, says that the problem of congestion can not be solved by rapid transit and then goes on to break to elaborate on this assertion, saying that given a culture in which people have experienced some car ownership - that's spelled out in detail in the context - people will not give up the luxury of an individual vehicle which is capable of travelling from door to door. Now, that is a very controversial assertion because of course the people who are in favor of rapid transit are - if you like - ignoring that claim. There are empirical grounds for making the assertion, but I'm giving that example to point out how tricky this can get. Those of you that know anything about this topic know that there is a great deal of controversy and discussion about it and nobody feels that the case has been established clearly one way or the other. So there again, that assertion which appears in the problem statement it must be demonstrated or at least evidence must be brought forward to show that that demand arises - that's only part of the problem - but that demand is one of the constituents of it - arises in the context of an urban area with a given level of automobile ownership.



Now, the second ~~a~~ condition, again ~~depend~~ dependent on what the nature of the problem is - is also pretty obvious. Let me give an example to bring out the difficulties slightly though. Mrs. Lindheim has proposed a pattern recently for the organization of beds in hospitals - and she has observed that the present organization of beds is such that each patient is served by a central nursing unit and therefore you get different nurses at different times - if your a patient - and a number of nurses are serving a very large number of beds. Now, she ~~s~~ states the problem of impersonality - the fact that under those conditions a patient naturally begins to feel de-personalized - doesn't know which nurse is coming when - doesn't feel real at ease with the nurse who comes because it may be a different nurse - a different time - the fact that that problem occurs is again an empirical question which there's not ~~a~~ very much doubt about that particular one - but you can see that it's - that it self is subject to proof - that really occurs as a problem in present hospitals. Anyway, then she has made the suggestion that each nurse, or possible nurses in pairs, should be responsible for very small nursing units consisting of ~~about~~ around eight beds - eight to ten beds - each - and under these circumstances the idea is that each patient would inter into a specific relationship with the nurse serving him or her, and it would eliminate some of these problems. Now, the second condition here says: Is it true that the pattern stated - I just described it - solves the problem in question. That's an empirical matter and its not too easy to show but it's possible to compare hospitals where such nursing units exist and there ~~are~~ rather rare unfortunately, or also it is conceivable to mock-up that situation without making any major changes - it would demand a lot of money - in existing hospital wards and to find out whether the feeling of not being treated personally in fact changes in those two settings. The task of establishing



if this condition holds can ~~x~~ sometimes lead you into techniques which - well - it leads ~~xxx~~ you into questions which you just can't answer by doing experiments in the real world. A student of mine last year, by the name of Ron Walkey, designed a pattern which was - it was an eight lane loop surrounding the core of a central business district and ~~organized~~ organized in such a way that it could clear the cars coming in and out of that thing at very very high speeds and without any particularly exorbitant costs. This eight lane loop was organized in such a way that it had access to parking continuously along the length of the inner lane so that it had something of the order of a hundred access positions. The handbooks dealing with weaving and traffic flow which are available in traffic engineering are not adequate to tell you whether or not this thing would foul up. Another words after constructing it then we started asking is it - you can image you've got cars simultaneously coming in and you have a lot of cars trying to get out, and its an open question as to whether this thing - it might just seize up ~~although~~ altogether or it might ~~just~~ flow and in order to find that out we built a simulation which gave the cars the kind of characteristics that cars are known to have in terms of acceleration and deceleration ~~which~~ and weaving movement and ran this thing and showed that it actually has the capacity of about somewhere around 15,000 cars an hour, which is higher than that required by the core of most central business districts. So this demonstration dealt with condition two - it was not experimental in the normal sense this calls for standard technique - particularly in planning. Now, when you propose a pattern, if conditions one and two are not satisfied its pretty obvious - somebody is going to see that right away - in fact your fairly unlikely to write one down which doesn't satisfy conditions one and two as soon as you start thinking this way. Condition three is a much much more serious matter. When people criticize patterns it is in fact almost always because they fail to meet condition three. Now, let me just talk about it informally.



If you write a pattern and propose it to somebody - you remember that you are now doing something that is different from showing somebody a building project - because your showing somebody an abstract pattern and so the question immediately arises - well are there things which have been left out which are going to have to be solved along with this pattern and which are going to foul it up completely and make nonsense of it. For example, the nursing unit pattern that I just told you about makes pretty good sense in its own terms. Let's assume that ~~xxx~~ we can demonstrate that the patients feel bad and let's assume that we can demonstrate that when they're in that relationship to a nurse they feel better.

The kind of criticism by somebody's whose serious about this is going to be going forward is the following: Look, this is fine, but you have missed the whole point of the present organization of hospitals namely - of course we'd all like to do this with the nurses but the trouble is every now and then a nurse gets sick or can not come in or a nurse gets overloaded because a patient is in particularly acute difficulties and then if you have a one to one relationship between a particular nurse and her eight patients - those eight patients no longer have anyone to serve them. So this puts a very great strain on the administrative organization of the nurses. In order to solve that problem we have instituted this system where we have a huge number of patients served by a large number of nurses so that the nurses can all double up for each other and nothing is dependent on the presence or absence of any one nurse. There are ways around that - in the case of the pattern I proposed, so it's not a devastating criticism but it is the kind of criticism which you really and truly get when you start showing people patterns.

Let me give another example: More familiar - Le Corbusier proposed a pattern, though he didn't call it that, in which people were to be housed in very very high buildings surrounded by large amounts of green space - the radiant city concept.



Now, this pattern has actually be adopted of course, its been built many many times over - all over the world - and in different versions whether its in housing renewal in South Harlem or whether its in a Marseille block which Le Corbusier did himself. Now, the ~~diffxxx~~ difficulty is ~~xx~~ with this pattern - let's just get clear what - let's put it in the proper format. The context here is high density residential areas and I don't think it was originally proposed with any more restrictions than that. The problem was to get everybody to have light and air, as it was described, and also access to open space. That was the problem. Let's take for granted for a moment that that really was a problem or is a problem and also this solves it. It is true that these apartments get full of sunshine - if there properly done - and there is lots of open space around.

The trouble is that there are other problems which arise in this same situation which happen to be ignored by this pattern. For instance, first of all the people who live in these kinds of apartments are strangely reluctant as experience shows to use this land for recreation or even to talk a walk on. The reason seems to be partly its in this sort of uneasy realm of ownership - nonownership - its not quite sure clear - certainly not your own back yard and yet its not really a park either, its aggravated I suppose by the fact that nobody particularly wants to talk a walk under several hundred pairs of eyes and the problem becomes even more subtle when you start talking about children. Because one of the prime needs for open space is that felt by children and what happens in these projects is the following, usually, I mean some version of the following thing happens. Because all of these people feel some kind of pride or possession of the piece of land that the building is sitting in. They do demand that it be well ~~x~~ kept. At the same time since it doesn't belong to anyone of them, no one of them is going to get out there with a lawn mower. Result of this is that some agency, whether its a caretaker of a building, ~~xx~~ anyway somebody whose responsible, is either elected or paid or authorized to deal with the problem



of keep~~ing~~ing this land neat. Now it happens that that person or that authority, almost always ~~x~~ exceeds its original mandate or maybe just finds that the only way to ~~han~~ handle this is to get fairly strict about the use of this land so that you start getting keep-off the grass signs and little bits of string and fences put up around the edge of this and children who are trying to build tunnels and throw mud at each other at not allowed to do so. ~~1~~ I'm not trying to make a humorous thing out of this - this is a system ~~of~~ effect which has occurred recurrently in this kind of situation. I'm not saying it was predictable. I'm not saying that Le Corbusier was foolish to propose what he did. I am saying that this is a reality. They are real problems which enviatably occur in the context of - well, now let's just go to the wording of the condition. You see it wouldn't be enough to say that those problems that I've just described occur in the context of residential housing, the point is that those problems occur in the situation defined by context P plus Pattern P. In other words, given high density residential and given this kind of pattern then all those problems that I've just described come into being. And the trouble is that in ~~an~~ order to solve those problems, that is to make, to organize the land in such a way that one isn't going to get quite such compulsive control of it necessary that to make it possible to make people feel more at easy on it - it will probably have to be broken into smaller pieces - to make it possible for children to dig it up and mess agound with~~x~~ it.- certainly it will have to be arranged in some way so that people don't feel badly about its appearance. Now I would claim that in order to solve those problems your going to have to institute further patterns which are incompatible with the original pattern. Now, that could be argued. But if I'm right than this condition is violated and it is on those grounds that one would throw out this particular solution or this pattern.



Question:

Reply: I'm saying that that's an empirical question - in other words its really up to - anyone that I make this statement too is now free to say look all the problems that you just described could actually be solved perfectly simply within the arrangement which is described here without having to change it. You see what I mean, that is you could still have the radiant city but you could do all kinds of other things in and around it lets say, which would actually make the original concept quite alright - that pattern. You could solve the problems within its frameworkd If that can be done then the condition is not violated.

I'm claiming that it can not be done and therefore I am asserting that the condition is violated. Now, it is - that's what I said at the beginning - it is very very ticklish to decide whether or not these things ~~hold~~ hold. A lot of you are probably familiar with Popper's view of scientific work - are you? Does that have any - can I get a general sense of hands how many people understand Popper's views here. Not all that many. Well, then maybe I have to go into that at some point. I don't think that right now would be the appropriate time. In the modern view of science says quite clearly that any empirical~~xxxxxx~~ assertion is only a guess which is at best an informed guess, you can never prove any possible assertion the only thing you can do is find counter examples. So that in that sense it is a perfectly normal kind of empirical assertion for me to stand up here and say - that condition is violated - it is impossible to find a pattern compatible with this pattern that solves the problems I described. That is subject of course to reputation. Anybody who can propose a counter example but its an empirical statement.

Question:

Reply: Let me go through - ok let's discuss that then. I'm not going to rush through s the other two conditions. I deal with those next time. Let's start talking about that. Variety. Let's try and get the question a little sharper. Do you want to relate it



to this example?

Question:

Reply: He says at what point is this pattern itself negated and at what point is there sufficient variety within the pattern. Now, I don't completely understand this thing yet but I'm going to try and bring it out. Let me first of all mention the fact that this pattern is really not that rigid. In other words the assertion that is made is quite quite general. Of course Le Corbusier's drawings were rather rigid - drawings usually are but the - all he said was in order to get people enough sunshine and open space and light - instead of building low buildings rather close together - build the buildings very high and space them far apart. Gropius made a rather similar argument which some of you probably know showing that for a given density of person's per acre or persons per square mile if you put the same that same number of people into a few buildings which are high - he did it with slabs - the day light angle gets better and better and better. In fact there would supposedly be more sunshine coming into the building as the buildings get higher. You don't have to demonstrate it really. This is a very flexible pattern. There are a tremendous number of kinds of ~~xxx~~ buildings all have conformed to this pattern. As I say there are - there's that redevelopment just south of 125th Street in New York, or there's the Royal Hampton Development just outside London - ever single city in the world has examples of this kind of development by now. Anyway a tremendous number of cities do. and there all quite different. When your worried about the variety could you elaborate on that and again try and make your point.

Question:

Reply: Well, how could you do that. I mean some of these apartment are up here. How could you put open space in front of it?

Question:

Reply: I see, given the generality of this which just says that people should be in very high - The difficulties there would be, I think, mainly tremendous cost. I mean,



tried to start putting substantial gardens on every floor for every apartment in this kind of a construction. First, there would be tremendous cost. Secondly, with a normal eight or nine foot ceiling that garden - you see most of it is not going to get any reasonable amount of light. Now, you could start organizing it in such a way to get more light in and raise the cost - and then the third thing that would go wrong is the whole aspect of really having that plastic ground - remember we're talking about kids particually, bushes mud, streams, things like that are all obvious impossible to get in side there. I think I haven't quite answered your question yet but yes, go ahead.

Question:

Reply: Well, its really difficult - I can relate it to those three concepts. First of all on the memory one - its fairly obvious that a pattern which had the condition which ~~w~~ satisfied the conditions that I've stated, ~~quix~~ would be a very good item in a memory. It would be very valuable if it had those three properties because then you'd know that where ever that context arose that there was this problem that had to be solved and ~~xxxxxx~~ that this pattern indeed solved it and what's more that it didn't create condition - more problems - than it solved essentially that's what the thrid condition says. It's a pretty valuable item of memory and that's the key to that. As far as coordination is concerned, for the moment I'm ignoring that because I'm treating the patterns as independent units and the third condition is actually the key to that because if the third condition is satisfyed and you can find a pattern which is more or less independent of all the other problems besides the problem which it was addressed to then you know that it isn't going to interfere in an awkward way with other kinds of patterns invented to solve other problems. Of course, it doesn't guarentee that you'll suceed in solving all of them which is part of the coordination task, but it certainly doesn't interfere with that. Now as far as variety is concerned, actually that is dealt with in conditions four and five in a way. I wonder if I - in fact most of the



business of variety hangs in condition five and I'll get into it the next time and I'll take off on your question.

Question:

Reply: How do you mean it doesn't help design. If what I said this morning is already making an effective criticism of a pattern which has actually been propagated to millions of dwellings ----- for those reasons anyway - no this is true of course -----

I see what's being said here - this is rather important - let me just make a quite comment about that. There is nothing in what I am going to say in this quarter which tells you how to do better design - I want to make that quite clear because this is comparable to the situation in science - there are no techniques which will get you to invent better hypotheses. You're either a good physicist or your a bad physicist - its the same with design - your're a good designer or a bad designer. I'm not offering here a methodology which is going to bring somebody who is bad at design to do better design. I mean, the problem that I have stated which is that of coordinating all of the forms in the environment so that they add up to being a coherent whole has nothing what ever to do with trying to get bad designers to make good designs. That's important because its a misunderstanding.

Question:

Reply: Yes, I'm saying that a successful attitude to the environment has got to have all three properties that I've talked about and I think for instance, ~~ix~~ almost all the attempts that are being made have at least one