Lecture 18 nov 10

Now this stuff I have handed out is more or less stuff I have been through on the patterns. What I want you to produce is much more than this, I don't mean more in quantity. I mean that all there is here is enough to construct patterns and we are now going to set up pattern and we are now going to talk about the sense in which they make a structure. The sense in which it operates as a language. I have not done those things with this material I do want you to attempt it. I'll discuss as much of it as I can in thefollowing lectures. So don't take this as a model of what I am expecting from you. Also one other minor confusion I want criticisms by week handed in on Mondays. I don't expect you to be turning in the pattern material by week or daily. I'm - I think there is not much point in it I cant get it back to you corrected. You might as well hang on to it and I shall take that in at the end of the course.

Now we have more or less got the concept of an individual pattern straight. Now it is time to talk about the sense in which these individual elements form a language. Now there are two distinct senses in which these elements form a language. First of all, in the sense that they are associatedwith one another in certain ways. Secondly in the sense that there is a generative system or a syntex which actually produces objects from them. To use an annology from human language to make those two different things clear. Everybody is aware of the fact that in human language you have a grammar or syntex that is the second of the two. Infact alot of the studies of linguistic structure that have been going on in the last decade have concentrated on the syntex. There is also underlying human language a complicated sematic base that is a set of associations between meanings among the words that constitute the elements of the language. Although nobody knows how to describe this and as a result there hasn't been very much work done on it that is the other curcial element to the language because ofcourse you could have a genative system which tells you how to combine an element according to certain rules and some that could be entirely meaningless so we have those two things to deal with.

Now the first one, I'm going to attack first the problem of how to associate these elements with one another. Before I go into it I just want to set the scene for this problem let's imagine that we have a hundred thousand patterns at our disposal of the type that I have

been describing. That's not an unreasonable estimate of the number of patterns there might be to in order to give the beginning of an adequate formulation of an urban environment should be like. Now as things stand at the moment we have absolutely no idea of how to organize these hundred thousand objects. I mean I am talking literly bits of paper. You have 100,000 bits of paper with an image on it and some words and how would be store them They would occupy lots of space. How do they relate to one another. And just to make the- to bring home the difficulty of the problem. The first thing we think of is to classify them. That is you have some for housing and some for commercial buildings and you have some for transportation and on like that. Then within those you have sub classes and so on. It is fairly easy to see that that can't possibly work for instance the example was brought up at the end of my last lecture.. Som ebody mentioned the possibility of having a pattern for putting the hooks in an office recess off circulation path. Now as we discussed it it became clear that that pattern has much more general applications than the specific context of a house entrance. It would be meaningless to classifly that under housing because it obviously applies to manny many different situations. If you were going in for a classificatior system the only reasonable thing to do would be to duplicate that pattern many times that is say put it in under housing, offices, apartments and everything else liek that. It is fairly clear that that would be a silly business because you could either getinvolved in classifs dublicating it humdreds of times. It is obvious that human memory is not organized that way. When we remember that fact it is strongly counterintuitive to think that we have hundreds of duplicates of that pattern in our mind one for each of the cases where it could occur. It is much more reasonable to suppose we only have it ones. Then the question is: where is it. I want to draw attention strongly to the fact that the problem I am going to introduce this morning which is the problem of hooking up all the patterns so that they are all associated properly with one another. is strickly analogous if not identical with the problem of human memory. I have already said that I believe understanding of the environment and out knowledge of how it is put together at any given time is built up out of patterns perhaps not formalized exactly the way that I've been formalizing it but that

we do remember these things in more or less the way that I have been talking about. And it is obvious that we remember them coherently we know which patterns we are allowed to be associated with which other patterns. So that the problem of doing this in a memory - in a stoee within the language is exactly the same as the problem of knowing how human memory does it. I am not saying that it might not ultimately be possible to do a better job than human memory but it is quite certain that we have to be able to do what human memory can do . And I reemphasis the fact that at the base of human language also is the human memory which is tying all the various words and concepts together. That is a necessary base for the operation of the language.

Now I am going - so you can take my lecture this morning as being a lecture about human memorey not just about the pattern language. The key problem is like this: we define a pattern as being a rather general geometrical relationship between certain parts . We haven't been very precise about the parts that is we haven't been - for each of the patterns I have been giving you I haven't said these are the parts A B C and this is the relationship among them. INfact there is a reason why I havent done that.1 It is rather difficult to do we are going to be looking at why it is difficult to do this morning. But that is essentially the nature of the pattern and remember also that the parts which are allowed to be in patterns are not necessarly physical objects like bricks and doors but that they are also - they may also be defined in social terms such as a middle class neighborhood is a legitimate part in this sense or a place where the cupting of cold food occurs would probably be a part in the kitchen is also a legitimate part. A long as they are spacially defined these are the parts that we have been relating to one another. Now the most obvious way of trying to build the memory so that the various patterns are correctly interrelated goes something like this: you say OK so each pattern is made of certain parts and there is a relationship among them there fore what we must do is have a kind of giant vocabulary or dictionary ods of parts presumably openended. But this is a seperate endity. This is a list of the available parts in a system we will then attempt to express each pattern formally as an arrangement of those parts in a vocabulary . Then of

course, we shall assume that 2 patterns are associated when they have a part in common because in that case we will say that those two patterns are alike allowed to be used together. They refer to the same situation. Let me give an example. Some of the - a few of the patterns we have been discussing so far one of them asserts that between the parallel streets there will be entries called driveways these are the local streets which serve the building particularly the houses. We also have another pattern the very first one in the house entrance theories which says that if a house is standing on a street then there must be a sign in a certain kind of relationship to that street. Is that drawn big enoggh so you can see the back. It is OK. What I mean by an association between patterns is it has to be obvious by the waythe languages is constructed that this street here is because we know that this is the object that is serving the houses and it must be quite clear and unambiguous that there is an identity between those 2 things and there might be - and you might also want it is anticipated that it is possible that if you ever tried to have buildings operation directly off these regular pass streets then you might want to think of an association between that and that also however not the way these patterns are written at the moment because this one expressly states that this street has vehicles moving on it between 5 and 30 miles and hours and we know that they are moving faster here on these main things so even if there were buildings with direct access off this the pattern would not be appropriate but for this it is correct. Now how are we to obtain this association. It is fantastically simple point apparently. According to the approach I just outlined if one had vocabulary or list of parts then one would presumably have a part called street lets say and just the mere fact that each of those two things was identical with that label would be sufficient to tie them together and to make them clear that those two patterns are to be combined in that way. Now I just begin to draw apprehensive attention to the fact that when these patterns were originally written this was called a driveway and this was called a street and it happened that this was called a street. Now one could dismiss that as a mistake or as a confusion that must be cleared up . So somebody who is committed to the idea that there is to be a list of parts

and that each pattern is to be a combination of these parts would say well obviously you have given these things the wrong names these things must be renamed and I will - if you want to call that a street then we must call that a street and we must a call this an arterxy.

Question:

RePly: I am going to get into this and it is very complicated and it is exactly what your intuition is telling you is the difficulty. So that one could - so somebody could convince himself that it was really going to be possible to rename all the various parts that appear in various patterns in such a manner to make this thing stick together correctly. Now the crux of my lecture this morning and It may go on on to next time is that this is not possible. I will characterize that approach as a part base approach and I will contrast it with the pattern base approach which I shall describe as we go along now. Just to say a little bit about this distinction the part base approach assusmes that there is a list of endities to be called parts and that every pattern is a combination of these in that sense the part is primary in this approach and the patterns are thought of as being derived by combination. In this approach the patterns are considered to be the primary endities and the parts are in effect derived from them but also have no real meaning outside the patterns. What I mean by that is this within a pattern one will be allowed to distinguish things that you might call a part of this pattern so you can identify that little driveway as a part of that pattern. And you can identify this street as a part of that pattern but in the pattern based approach there is no such thing as lifting the part out of the pattern and treating them as symbolic endities that can be associated and combined and related to each other. There are mathematical reasons why that cannot be done and why it doesnt make sense which we will see. I ought to make it clear that this approach is fairly characteristic of modern logic and modern psychology for instance absolutely all the work on foreign languages that exists at the moment, no matter what field, makes assumption of a vocabulary of parts which are to be associated and combined in certain ways and they are all part based approaches. Pattern based approach

which is really saying Patterns are the fundamental things and parts are merely constructs of ours is characteristic of Gestalt Psychology and a number of others the rather nebulous diciplines that have been floating around for the last half century also much more characteristic of the way artists think, It is really going to be a difficult struggle to pursuade you formally that this approach is necessary to the human memory or a memory capable of doing what the human memory can do must be organized in this way and cannot be organized in that way. I want to make it clear in advance that this is a very controvertisal proposition and one which you would not find support for in the current state of linguistics or psychology or modern logic.

Now inorder to make the arguement I am going to consider an - I am not going to consider this example . Will you forgive me for that. I probably should have tried to construct an example out of these materials that we have been working with. It so happened that when we discovered this we were working with another example and I am going to repeat that to you because I haven't had time to make a different one. This example concerns the following very simple facts which any human memory is capable of remembering. It is increadablely mundane, delibertly so because - just because this is such a nebulous field. It concerns the use of a opaque glass in bathroom windows. Now the facts which we begin with, which any human memory can remember are these: I will describe these facts and tell the patterns but above all I just want to get a sense of what it is that we are all capable of remembering . We all know that there are such things as standard sectiond for domestic windows. There are a number of different available sections of course there are metal windows, wood windows and different varieties of each. For the purposes of my discussion it is enoggh that you remember the fact that - lets concentrate that there is a particular metal window section that you know which is of the kind which can be used in more or less any domestic window it is common the normal F shaped window section. Offten set in a wood surround. Now we all know that that section can be s used in bathroom windows and that it can be used in livingroom windows. We also know that in a bathroom the glazing will usually be obscure. It will be ripple glass

or some other form of obscure glass not always but usually. We also know that the glazing in a living room x window would never be obscure but would be clear glass. Now just to elaborate the point slightly I am going to assume that we all know that if there is a hand basin and if the bathroom has a window at all w the window will usually be placed near the hand basin or to one side of it so that it lights it not always but usually, We also know k about living rooms that the window area somewhere is of the order of about 1/5 of the floor area. There are codes to dhat affect in places but it is a very fairly typical kind of relationship . Now we know some additional things about this situation. We know that the use of a obscure glass transfers to other cases beyond bathrooms we know that for instance if a person were to build a sona house and that sona had a window that there again one would probably tys use the same kind of obscure glass and similarly if there were a seperate laboratory we would probably use it again. Infact you would use it probably in any room in a house where people were naked but didn't particularly want a view as they usually do from bead bedrooms. Another thing that we know is the fact a that the use of obscure glass in bathrooms is not universal . There are atleast 2 cases where there might be clear glass in a bathroom window. One of thexm would be the case where the bathroom window is very very high up d a clear story for instance or simply a window set extremely high up towards the ceiling ,soxo that nobody k could see in through it . The other case would be one where the bath room window gazed on to either a totally private court or something like a forest and if this was a country house or a thicket or some place where nobody could ever be . In both of those two cases the window would be likely to be glazed with clear glass not obscure.

Now what I am going to try and demonstrate is that these facts though increadly mundane and obvious - it is almost impossible to build a set of patterns according to the part based approact which adequately remember these facts. Now I am going to dis identify a number of patterns I'll draw them on the board to begin with so that we have a simple frame of reference. I am going to draw this schematically that pattern is the pattern which says in a bathroom there is a kind of relationship between a window and a hand basin if the

bathroom has a bathroom in it. And here is a pattern which says that the living room windows occupy a certain - the area of these windows is a certain dange of proportions of the floor area so the parts in here are floor and a window and basin and bathroom . Oh I should make one point clear - let me just back track a minute . I am using the word pattern this morning in a slightly different sense from either of the two ways I have been using it before I should have explained that. I am using it to refer to the context plus the pattern that is I am using it to refer to the entire spacial endity. For instance you remember in the case of the street sign thing actually the way I constructed that pattern was that the context was a house standing on a street. That was the context. The pattern said that this sign had to have certain characteristic relationships to the ground and to the street. For the purposes of this morning, I am not distinguishing between context and pattern, I'm assuming that they are taken together as they are in that drawing there and that we're referring to that whole entity consisting of context and pattern. We're talking about the entire spatial entity that is remembered. That is what the word pattern means in this morning discussion. In this case for instance the context here would be if a bathroom has a window - a bathroom with a window in other words and the pattern says there will be a certain kind of relationship between the window and the basin. But those are all being taken together.

Now, the next pattern is the - you make think of as the cross-section of a typical metal window. So I'm going to do this schematically and say that that cross section asserts certain things about the window the outer frame, the metal frame, and the glazing. Now there's a pattern which says that a bathroom I'm going to simplify things for a moment - a bathroom will usually have obscure glass in it. A bathroom window, I'm sorry. Here we have a bathroom and that is a window and that is the glazing and this is obscure glass and this is the window and that whole thing is the bathroom and over here we have the living room and here we have a window and this is clear glass. Now I want it to be clear to everybody that it is possible to regard each of those five patterns as an arrangement of part

- it's fairly clear what the parts are in each case. Remembering the additional fact that I did mention several weeks ago that within a pattern the part can itself have a characteristic geometry as the metal section would do in this case. The parts themselves have some shape and then they are arranged in certain ways.

Let's start off with the idea that there is a part in our vocabulary of parts, called window. There is -- let me -- its extremely difficult to make this clear because the idea of the vocabulary of parts does not necessarily refer to the use of words at all, so what I'm asking you to consider now is the possibility that there is an abstract symbolic entity in the mind which is window - it may not have that tag on it - but it is a single entity which refers to the things that we call windows. Now if there were such an entity then this pattern would include that part - it would be there - this pattern would include it, this pattern would include it here - this pattern would include it and this pattern would include it. So this part - if there were such a thing - would appear in all five of those patterns.

The difficulty that occurs immediately that you say that is if we are going to associate two patterns when they contain the same part - by token of the fact that this contains the part window and this contains the part window - that is what its telling us, that this detail is allowed to be a detail for this window - if that's how we're assuming this thing works and similiarly the fact that that entity appears again here is what tells us that this is allowed to be a version of this - in other words, that glazing is allowed to be obscure glazing, and also that this window is allowed to be an example of that. Within that way of talking about the thing, we would also have to admit that this window being the same as this window in the vocabulary would associate these two patterns and yet we know perfectly well that a living room does not have obscure glass in it. So this is the first stumbling block.

Now, this is admittedly the crudest possible approach to the idea of parts. It is fairly clear that it certainly could not be any one symbolic entity called window which appears in all five of these patterns and accounts correctly for the way which these patterns are to be associated with one another.

I'm going to call these patterns by certain letters "P", Q, R, S, T. In order to talk clearly about these things I'm going to introduce terminology - I'm sorry it is going to be very difficult to understand, but its a difficult matter. It is clear that we can define a thing called window P - that is that part of this pattern P and similiarly we can define a thing called window Q which is this part of that pattern and similarly we can define a thing called window R, and window S, ad window T. The assumption that I just made the possibility that there is some entity called window in general is the same thing as saying that there is an equilivant relation on these parts of the patterns P,Q,R,S,T - now I - could I get a quick sense how many people in the audience know what an equilivance relation is.

Well, I'll keep going intuitivaly as far as I cank. and then when we have to start writing down some arrows we'll see what happens. Essentially the idea that you can identify parts not within the pattern is the same as saying look let's create a relationship between these things which I'll call "is the same as". So the relationship is like - if you write window P is the same as window Q - and window Q is the same as window R - then that relationship if assumed to have the properties that - well the most important property that is at stake is transitivity and that means that if window P is the same as window Q and window Q if the same as window R then we can assume that window P is the same as window R. Now that is the same thing - this is exactly what we do without realizing it when we say that there are parts outside the pattern and there is a particular part called window which is happening five times cause we're effectively saying that that part is the same in each case and it's because of this

it is the constructivity that is getting us into trouble because we certainly want to say that that window is the same as that window because we know that that detail can apply to that. We also know that that detail can apply to that under certain circumstances but what our intuition tells us or what our memory is capable of remembering is that that window can not apply to that. So that the transitivity of this relationship is breaking down. Is it clear that just because window S is the same as window Q and window Q is the same as window R it is not correct to make the inference that window S is the same as window R.

Now let me go just a little further. I'll get off the transitivity relation. Let's introduce another notion which is what common sence would come up with because you take a look at this, well it is pretty obvious that there isn't any one window which is going out throught all there. There is a simple way of doing it, let's assume that our vocabulary of parts doesn't contain things like- it isn't just an unordered list of parts but it also contains more general and more specific versions of certain parts. In other words we could have a part called window and a part called bathroom window and we could have a part called livingroom window and we could make the assertion - now our vocabulary of parts contains three parts remember these things are quite apart from these. When they have a subscript they refer only to the part within the pattern. Written without a subscript they are considered to be elements of a vocabulary.

Now the reasonable thing to do would seem to be the following: obviously a bathroom window is not the same as a living room window but on the other hand you can say that a bathroom window is a window and a living room window is a window and therefore you try to - you hope to get this situation back in the following manner . We will now attempt to say that these two patterns contain the element bathroom window and this pattern contains the element window and that these two patterns contain the element livingroom window. And we will assume that a pattern in which - I'll just write that in - Window this is the bathroom window and bath window and living window and this is living window. Now there is a very - reasonable way of establishing the fact that we all know

that this applies to this and this applies to this that this applies to this and this but not across here. Is the following rule. We will associate the following rule - wait a minute we will construct the following scheme we will construct the window and we will say that window has special cases: bath window and living window and we will therefore write arrows like that whenever you have a special casing and we will write equal signs between the windows when they actually are the same part . In other words, because this is the part bathwindow and this is the part bath window we write that there and similarly here because that is the part living window and this is the part living window and it is fairly clear that in that scheme you overcome the difficulty that I have mentioned so far . In otherwords this is no longer asserting that you can use pure glass in livjng rooms because according to this scheme there is no association between this part the bathwindow and this part the living window. but neverthe less you are taking into account this very general detail which is the window detail .

Now this is half the story so far, we seem to have got away with the part based approach so far. What time is it. Its one. I was going to have some questions. Well infact I think we will do that. We will start next time with some questions about what I have said so far and then I will continue with the second development of the arguement to show that even this does not work.