The Falcondale Collection

Stafford Beer

Initiates an Audience into the World of
Systems and Managerial Cybernetics

Session 4

Homeostasis & Viability

So, how did the newspapers go? You're looking for requisite variety now you know what your're after.

A bit more sense today than it did yesterday, did for me anyway.

What did you find Glyn

A few articles, the Israeli bombing in London was a big one. They were talking about all the security measures they have done on Kensington Gardens Road, the road that is blocked off at both end, they have security cameras, they have patrols, they have all kinds of things but yet still they manage to blow up the embassy.

Certainly a lecture in requisite variety, isn't it?

How the hell do you actually contain it? Did you all talk about that one? No.

I assumed somebody would take that up. You see, if you ask yourself now with your embryonic cybernetic knowledge, take the airport situation. I played a game with myself, I hasten to say, before I'm marched off to jail; where I would say, for years and years and years, I said I have put sticks of dynamite in that tin and nobody ever opened it; there wasn't of course, it was cigars in those days and look it is a matter of requisite variety isn't it. So, if you really sat down and said, well how would I more or less guarantee, as a cybernetician, that this cart load of people on a aeroplane would get there all right ? You would probably have to strip them all, do a body search, give them a cotton robe and put them in the plane and take all the luggage and clothes and belongings in another plane, wouldn't you? I don't really see that anything less is going to guarantee it. So all you can do is diminish the risk.

Have you all heard the famous story about the man who wouldn't travel on an aeroplane because of the risk of bombs? Well he wouldn't, and he was always late for the international board meetings because he was always going to be appointed sitting by train or bus and god knows what... One day he arrived on time and they said "Well George good to see you. What happened?"; He said "well I travel by plane now". And they said "Oh you've changed your mind " and he said "Well, yes. I saw a statistical assessment and there was one chance in a million of anybody having a bomb in an aeroplane, so the chances of two people having a bomb is a million squared .....So I carry a bomb !! (laughter)

So I think that is a wonderful example and I'm glad somebody picked that up because it really is a serious issue, in trying to get the requisite variety.

Now the whole business of policing is of the same kind, because the ideal..... just think for a minute about the ideal, forget what makes sense. If you had a policeman for every citizen, who was watching everything you did and said cut that out that's section 3 of ... or the other role of

the police, looking after you....to say duck... she is coming at you with an axe. Then obviously you would be able to do it, but you can't.

When I last studied this for the Home Office, I found that there were 500 times as many people as there were policemen. So what are you going to do about that? The fact that you have got that disparity, now there are answers to this. What do you think?, what do you do?

Eliminate the ones you know are going to cause trouble...

Well that's a very Fascist sort of answer.

Not if you are going to be eliminated!

Now, what I am asking you to tell me is what can you do to help the police in this circumstance?

Things like Neighbourhood Watch?

The Neighbourhood Watch is an endorsement of the police, that's good what else?

Small communities are sort of self policing, they set up inter connections amongst everyone....

There's a good answer to that, the Bayswater Farm that ... sorry the Broadwater, where they have set-up their own self help groups, and crime has gone down. Purely by them taking more vigilance over their own....

Well, this is community stuff, what can you do for the police? What have you done for the police?

Well the Law is the police!

The law of course, yes!, hello, hello, hello stuff... but go on, you are not getting near the technology yet.

You equip them

You equip them, that's exactly it, but what do you equip them with?

Telephones

Telephones, yes, but the crooks have telephones too.

Fast cars.

Fast cars, now we are getting there.

There was a radio on Tomorrow's World or something, where you can set a frequency were you can't listen in on encoded or something I am not sure of the technology, but now they are trying it in Yorkshire or somewhere, where the police have their communication all encoded so that people can't listed in, to know that if they are robbing and somebody like the police is going to turn up, so they scan first.

There is our American voice. What is the big difference in this equipment between America and us?

Guns

Yes, exactly, guns, well indeed. I think the debate about arming the police here achieves a lot more clarity and sanity if you realise that what you're doing is amplifying the variety of this one in 500 ratio of the policemen. This is a much more profound way of looking at it than to say. I don't like people walking around with guns or I do like people walking around with guns, that's all froth on the surface. The real thing is how are you matching your police ability to police, with the disparity of the numbers. That's pure requisite variety.

The worry with your arming side is that if you arm the police then crooks are more and more going to want to arm themselves. So you may have amplified your ability but you reduce or increase the variety.

Exactly, these arguments are quite familiar, what I'm suggesting to you that's different about this conversation now is that you base it on this understanding of Ashby's law, the law of requisite variety. Well lets leave terrorism, what else have we picked up today?

The Independent is..., it lost 90% of its market share from the same time last year, and they are bringing in a new editor. Is that a low variety solution to a high variety problem?

Oh well, it depends how good he is.. you see.. to project himself, again it sounds to me like a low variety, I mean, I like that phrase low variety solution to a high variety problem. Yes... No, the buzz is that Independent is going to crash isn't it..

What else have we spotted

Trying to control inflation with interest rates and the whole reason why they try to control inflation or for whatever it seems like that,.. using Andy's phraseology.. again definitely using low variety solution to a very complex problem..

Certainly is...

I have had many arguments with economists about the nature of inflation because, it seems to me that from a non cybernetic point of view that they regard inflation as a fire breathing dragon who is stalking up and down the streets which has to be shot or dealt with in some way. Whereas I see inflation from a systemic point of view as essentially a measure of the extent to which the poor are getting better off than the rich. You think about that because you see the rich are loosing value because of inflation and somebody with no money couldn't care less about inflation, obviously. If you've got nothing who cares! So that is a very different insight. I was nearly hanged from a lamppost in Oxford, about 30 years ago for saying this. Oxford being really a stronghold of economists.

Surely it hits the poor more than it hits the...

Oh I don't think so..

If you've got 10 quid and something now costs 9 quid and it costs 8 quid you've got a quid less in your pocket.

This is true, but if you've got nothing..

Yes but nobody's got nothing have they,

Well they are very close to it you see, so if you are very close to having nothing and somebody gives you a handout in the social system of say ten pounds, because you've got nothing you instantly spend it to get something to eat. So the inflationary effect is going to be minimal on you. But if I've got a million pounds in the bank and it is just going down like this well...

So long as your social payments go up with inflation

Well they do roughly, don't they or there supposed to...

If you take the parameter of the system a bit further out, the knock on effects of cause and effect....

Just be careful

The knock on effects of hard inflation are determined to the growth of a business which means not going to generate wealth as easily...

The're alleged to be... You see I believe you would have a lot of fun really thinking about this in cybernetic terms which I have always done, because I have watched the progress. I have worked a great deal in the third world especially in South America and India and I have watched the effect of the policies of the World Bank and the International Monetary Fund which are based on these beliefs and I believe that they are beliefs. Not substantiated.

Anyway that's a huge subject Let's get back; we're supposed to be wrapping up the newspapers here.. Any more?

Rwanda, people are dying from quite a variety of problems, they die of murder, they die of hunger or thirst or cholera. There are a number of different reasons why peoples lives are in danger.

And you can't address them all, can you?

No! the man in the street, the ordinary person can only address him on the way past, here's 10 quid.....

The awful things about those situations, from my observations, that is never mentioned, is that people settle personal scores. Too bad he's dead, you know, a rather wicked thought.

That's just like unpopular officers get killed in war. Too bad what a pity let's hope nobody finds the bullet in the back.

I wondered if anybody would mention the rail strike itself. We are right in the middle of it.

Except that with the rail strike, that's the interesting thing. If the strike goes on there is just the possibility that will inevitably delay privatisation and it might actually save the railways.

Yes, from the point of requisite variety though again you are trying to manage a railway through a few parameters whereas real social reality is much higher variety than that. What I am trying to get across to you is that people manage variety by making models which are low variety, so that they can handle the thing. This is nowhere more evident than the problem about children and parents. You make this model of your off-spring, and the off-spring is never like that to start with but then it proceeds to grow up. Changes everything.

Well, we had better get on

We are beginning to get to the stage were you have to do some work. It's no use me just lecturing you.

So. The next thing is.

Has anybody earned this bottle of wine that was on offer ?

No!!

You lazy crew.

Well I'm going to give you the next instalment of this thing, which is called The Explanation.

Now, I want to introduce two new things in this session. One is the notion of a black box. You've heard of a black box, but I'm not talking of the one on aeroplanes it's a much more general idea.

What do you think is meant by a black box in cybernetics?

It's got an input and an output and you are not really bothered what goes on inside.

That is exactly it.

You see there is one way of understanding terrible messes in terms of variety. That you look at the mess and say " My God what can we do with this?" But if you say never mind what is going on inside the black box. These are the inputs and these are the outputs. Then you can begin to see how it's related. That's exactly what this puzzle does. It's put it in such a way, Kate read it out to us, It's put in such a way as to make you feel Oh My God! What's all this about. Well actually it's very simple if you accept that this activity is a black box. You're told to do that because it says there is an investigation going on with the personnel department. You're not allowed to monkey with the inside of the black box. So what are the inputs?

Two types of jobs

And what are the outputs?

Profit and dissidents

So this is about the simplest problem you can have, and this is the reason why I have given you this thing. It's far from being very difficult which is what I tried to con you into believing. It is utterly simple, because you have this black box and you have two inputs and two outputs each of which has only two states. It couldn't be much easier, but of course, I am trying to tell you that in real life we don't see the wood for the trees. One of the systems tricks is to do that.

Now I will hand out to you, having saved my bottle of wine. I will hand out to you this thing called The Explanation, where I look at the number of alternatives.

How many do you think it is? How many possible arrangements are there of the.. You see it two in and two out each with two states.

You've got to get used to this problem of variety generation. Pardon? I said pardon and nobody said a word.

It's much more difficult than it looks you see. What a black box does is raise the variety of the output to the power of the input, so you've got this and this (Stafford gestures) like 2 to the power of 42 yesterday and in it's murder. and in fact its erm... Well I go through it here and I won't bore you with it this session but the answer is 4 to the power of 4.

What's 4 to the power of 4?

Any body

256.

So in order to solve this problem, you have got a set up a black box and you have 256 possible states. Now I have tried also, rather wickedly I suppose, to generate some anguish and anxiety in you about what the devil you do to go about measuring variety, right.

Did I succeed?

Good...

We are beginning to grapple with it here you see. Actually amongst all this mess you have to find 1 out of 256 states and then you can deal with it.

So please take that away at the end of this session today and try and solve it. Because you have got all the clues you're going to get.

The wine is out. Maybe half a beer.

So, there are more lessons to come out of that study. I'm rather pleased with that study and I think it will give you a feel for a lot of things. Now, so black boxes we have dealt with.

The other word I need, before we proceed is the word homeostasis

Does anyone know that word?

Know, really folks, I really am very carefully defining the technical terms I want and I am quite aware that sometimes my vocabulary runs away with me and I say like the frisson business....

Please stop me and say what the devil is that if you don't understand. Don't be shy about that. But the words we need I will define.

Homeostasis. What is this?

A homeostat... The thing that does it is the homeostat. Now what is the word you all know which is a particular example of the homeostat, the end is the same.

Thermostat.

Thermostat. Exactly. That is a particular example of a homeostat. and it's thermostat - therm being the Greek for heat. So there you are we are going to try and control the temperature.

Now, on this question of how you are going to grapple with this as a manager for instance

We immediately notice here some very odd things. What is the temperature of your body?

The interesting thing here is, we are dealing here with a sort of engineering term, a thermostat. We have one attached to the radiator.

I have never heard of a surgeon who has found a thermostat in the human body, there isn't one. It's extraordinary when you think about it, because our temperature is very very well controlled and what is more, we can walk on to a melting shop stage in a steel works, where the melting temperature of iron is 1,300 degrees for heavens sake, and then go into a refrigerator in a butchers and somehow it works. And there isn't a thermostat. So how does this happen?

Anybody want to comment on that?

You're getting feedback in your body somewhere.

Do remember Jane yesterday, I used the word intrinsic control when I was talking about the prison governor and the Watt steam governor and the sleeve going up and down? Now, obviously our bodies have an intrinsic control device which is non isolateable, because nobody has ever found it.

So the definition of a homeostat, I want you to remember, I really want you to remember this, is that it is a mechanism that holds a critical variable, now that could be anything. In the case of the thermostat it is heat, so it holds a critical variable within physiological limits. And that is the key to the definition because it's your body that determines this, by God knows what sort of complicated bits of machinery, but the problem is you see, if you get too hot you're going to die and if you get too cold you're going to die and the criteria is obviously something that's settled by your body. So, our normal ways of looking at this are no good to us at all because we are never going to find it, but we do note that you can go off into these extremes of hot and cold and soon, if you are healthy and not ill you are going to retain this nice even temperature. Now as I said, it's not just temperature. A huge number of things in the body are homeostatically controlled.

Give me another example?

Blood pressure?

Blood pressure, certainly

Pupils of the eyes..

Sorry?

The pupils of the eyes, the way they get smaller and larger?

Yes, but that we do understand, don't we? because there is a direct feedback circuit which depends on the intensity of the light which causes that to happen. So I would prefer not to use this powerful notion of homeostasis to describe what I would to prefer to call that stimulus response mechanism.

Hunger and thirst?

Sorry?, hunger and thirst, indeed, yes.

One very obvious one which nobody has come up with yet?..

Breathing

Breathing was the one I was after. Who said that?_Jane Yes. We manage to go on breathing at an enormous rate and it all happens and we sitting here talking and somehow it works. So things like,.. now, that's oxygen balance we are after here obviously, that's why your breathing? So we are homeostatically controlling the oxygen balance. The thing about Lee's example that's very pinpointable when he said thirst is the balance of water in the body, you get dehydrated and kaput.

So, we have this extraordinary mechanism, the homeostat and the huge contribution that Ashby made to cybernetics was to understand homeostasis. And his book 'Design for a Brain' is really all about how homeostasis works and he develops mathematical ways of looking at that, and so on and so forth. And he built a machine called a homeostat to investigate this. I may have mentioned earlier that all of us, in the early days kept building machines. I told you about Gray Walter's tortoise. We all built machines to try to understand things, ludicrous machines. And Ashby's homeostat was a set of magnets and pointers which all triggered each other off, you see, it's amazing how much variety you can generate like that.

One of the early cybernaticians went into a corner store, as they call them in the States, and found a sack full of magnetic compasses for kids. They are little round things with a needle

there which points North, very roughly of course because these things were only about ten cents each. He bought the whole sack, to the surprise of the storekeeper. And he made an array of 100 by 100 or whatever it was, I don't think it was as big as that, that would be 10,000, yes too big. 10 by 10 would be low but it was bigger than that. And there they were all sitting on the floor, all roughly pointing in the same direction, and he waves a magnet across them and watched the results. It took hours and hours to settle down again depending on how the magnet was waved. Now, this is more like a model of the economy than this crap (excuse the word), controlling the interest rates you know.
You get sort of waves floating around the system which produce oscillations, as we would say. I really wanted you to get the hang of homeostasis because that is as it were nature's way of dealing with this high variety situation, and the reason we can't deal with terrorism is because it's not built into nature. We are not supposed to have terrorists but now we've got them.

Have you ever thought about preys and predators? Cos speaking of nature, there you've got a fairly elaborate homeostatic system, that's fairly easy to understand in its effects, though not of course in a great deal of detail. It makes a very nice example of what we are discussing. If you've got a population of foxes and population of rabbits what happens?

The foxes eat the rabbits,

The foxes eat the rabbits. Then what happens?

There are so few rabbits that the foxes starve.

The fox population decreases.....

You've got it. It's a perfect homeostat.

Cos you can't afford to wipe out either population. Either the rabbits because they are being eaten or the foxes because they are being starved and somehow or another this levels out.

Now, nature is full of this stuff. and we go round teaching Biology, and most of it's incredibly boring and we are surrounded by this fascinating stuff that nobody has the key into discussing because they are not cybernaticians, I feel.

Well I've just done GCSE Biology and all the stuff you have just talked about we did!

Good! Why didn't you define homeostasis?

I couldn't remember what it was, it was only when you were talking I remembered.
Right O, We are trying to get into those biological realities.

Let me give you another example: You know what a cabbage aphid is,? A little greenfly, sits on the cabbage and munches. This thing, I don't know what it weighs, a trifling amount, And you take one cabbage aphid and an endless supply of cabbages and no predators, which is what we were talking about. What weight of aphidies would you have at the end of the season? You only have to start with one, these poor little devils are hermaphroditic, they don't have a sex life poor devils. So you've got one and lots of cabbage, and no interference. What is the weight that you would end up with at the end of the season?

Have a guess?

It's 822 million tonnes - now that's traumatic.

You think you've got a problem with terrorists? Why aren't we up to here in aphids or caterpillars or something, because of these interlocking homeostats.

The fox/rabbit one, is very simple for purposes of illustration. And what you've actually got of course, is a whole set of interacting networks that defies analysis but boy does it ever give you a respect of the way nature operates. It's just extraordinary.

And I so often wonder about this exploding human population. Everybody says what's going to happen and why doesn't the Pope etc. etc.

But what about past civilisations?

Well indeed. Look what happened to the Aztecs?

They ate.... They ploughed too much of their fields or whatever and in the end they starved because they had over...

We are getting into catastrophe theory here and things like that. Whereas a system that is working very cleverly and is in balance gets pushed over the edge for some reason.

Now, if you were hit by a comet, which is what I think happened to the dinosaurs, that really doesn't count as a systemic effect unless you're really thinking cosmic. If the idea of a comet or a meteor smashed into the Pacific Ocean, as it now is, creating up a dust cloud which blotted out the sun, would account for righting off the dinosaurs, but that's not the sort of thing I'm talking about. The sort of thing I'm talking about is the growth curve which is like a flattened out S. In mathematical terms it's a logistic. And somehow all these complex systems level that off. So, we should have more respect for these kind of things.

Well now, homeostasis is going to be very important to us.
What we are going to do is to use all these ideas which I've been trying to boil up inside you to consider the question of the viable system. Now this is very special terminology.

What is a viable system?

What does it mean?

Sustains,

Sustains yes good...

Anything more exact than that

It controls itself

Where does the word come from? How has it got into our language? It belongs to a very special discipline.

Ever heard of Obstetrics?

When is a foetus viable?

When it can sustain itself outside the womb.

Right exactly that, which is well before birth. Hence the possibility of Caesarean. The notion is precisely that, that you've got a system which is self sustaining, independently, you can only define of its origin, in the case of the foetus, of its Mother, but otherwise independently.

This is a very difficult concept to get hold of.

I want to level with you about this because if you overreact and say it must be totally independent your going to define something that doesn't exist. You see nothing is totally independent. I've always been very effected by the principle of the German philosopher Hagel.

Have you ever come across Hagel? Marx pinched all his ideas from Hagel in the first place. The whole notion of dialectical material is in Marx comes from the Hagelian dialect which says We have here a thesis and we have an anti thesis and we have a higher synthesis.

Now that is a very good cybernetic concept and what I was going to say that...

Hagel was the first glimmer of a systems thinker really in modern philosophy, talking about the last couple of hundred years. He had a thing which he called the axiom of internal relations, which I'll ask you to contemplate for just a minute, which says that the relations by which terms are related and are an integral part of the terms they relate.

Say that again, slower this time.

The relations by which terms are related and are an integral part of the terms they relate. And what this means is that a mouse is smaller than an elephant or it wouldn't be a mouse. The whole nomenclature breaks down if these things are not maintained.

And once you get that clear you observe everything that we discuss is related to everything else.

You also observe that the names of things are very important. Because we are using language all the time. We like to think that we are accounting for things that are going on in nature but what we are really accounting is a linguistic model of that which is kind of hair raisingly frightening actually if you think about it too long in the middle of the night.

So the viable system must be capable of independent existence but don't overdo it.

If some idiot came in with a huge Hoover and stuck it through the ceiling and sucked out all the oxygen we would all be dead. Are we viable systems?

Somebody comes through that door points a gun at me and shoots me.

I'm supposed to be a viable system, why didn't I survive it? Now there are obviously, like when we said that defining the boundaries of the system is immensely difficult, defining the boundaries of viability, is immensely difficult. You have to decide what is to be allowed to count, in other words. You could say that if a bullet entered me, if I were really viable the hole should close us up, as it does if you put a bullet through the tank of a spitfire.

It's lined with expanding rubber stuff, and the hole shuts because the gasoline expands the stuff inside and it shuts the hole, a very clever trick. And you could say, well if we were really viable we would do that and I dare say in the course of the next couple of thousands of millions of years, or whatever, we may develop that characteristic if all of us were continually getting shot if we could do it in time, and that is called evolution for you if you like.

So, approach this thing with gentleness please, a viable system.

Now, give me an example of a viable system? Apart from yourself we have established that.

The tides?

The tide coming in.
The tide coming in! Ah, I wouldn't call that a viable system?

Now why wouldn't I?

Now it's a very interesting question Lee.

I'm not sure!.

If that is a fairly simply analysed response system based on gravitational pulls and so on. And I'm not really looking at that as a viable system I'm looking at something which is uniquely identifiable and sustains itself.

Small holding?

Small holding? Okay, Yes..

Computer?

Computer, now there's an interesting one!.

How does it sustain itself if you don't plug it in ?

Well, That's what I'm saying.

You're saying right.

You have certain conditions

That's it

Like us we need air, water to sustain ourselves and be viable the computer needs power, it needs someone to operate it ..

It's a very interesting question this, isn't it?

That's fascinating because, it's an artefact that's why it's fascinating. So does it fulfil the conditions or not?

Try and store that one up, let's revert to it when you have got the whole model, we'll see what we think!.
Lets get on with more obvious examples please.

Well what about a company?

Some companies?

This guy has had a rough time!

Who knows The Great Ormond Street Hospital?

What's it for?

Sick Children.

Sick children, yes.

How long has it been there?

A long time!

A very very long time, so you see we have an entity, called a hospital for sick children which has outlasted, which I think is highly interesting, all its staff, all its patients, and it's still there. And it somehow cycles through its staff and its patients and it maintains..

Maintains what? What does it maintain?

Its identity.

Identity. So a viable system has an identity and maybe that is one of the problems that I was having with the tides you see. It is an identifiable thing which we are talking about which can sustain itself and if it eventually dies as we shall.

When you're dead, in what sense does that survive?.

There are the two answers to this folks.

As a memory

Oh there's a third yes

As organic material, ash.....

Well that's part of a bigger homeostasis isn't it. No I'm sorry I wasn't thinking of either of those although they are both legitimate answers.

Is it a record?

Well that's part of the memory..

Your children

Your children, We have developed this machinery of self reproduction which means you are surviving in that sense.

The other answer I was after was what ?

Soul

Yes. Not everybody accepts that but you see you may go to heaven or the other place or whatever, maybe you survive in that sense.

Why have people always tried to find out whether they do survive. I am certainly not offering.., after this meeting, I want you to see what the options are.

So, this is what we are after, a viable system.

Now, I floated a company and Glen's resistance to that, but again you see you have got a company,.. Take Harrods for example, been around a longer than all its clients and all its staff, so as...

Well my company, it's been there 80 years against all odds, but it's still there and it's still thriving.

Well it must be viable, that's right, that's the test to use.

So now, do you remember when we started off, you were with Allenna trying to identify things you would like to study, now which of these are now emerging are viable systems? Would you reckon, Do you remember the discussions - it was only yesterday? I wasn't there but I have my spies!

Manufacturing came up

Schools, Universities..

Well schools are interesting so are universities.

How long has Oxford that been there?

Five hundred years?

1,000 years so it's said.

That certainly has outlived its staff.

The church

The church is a wonderful example. How that remains viable is a study in itself, very interesting. How it hangs variety in the process.

Parliament

Pardon... Now don't leave the church I thought you were going to say something really explosive, I did expect you to. What is this huge mechanism that the church has used to control variety, by not allowing women to have a voice in the whole thing.

And don't blame that on Jesus, blame it on St. Paul.

But, that 's what's happened and if you've got this patriarchal masculine organisation. Now I hope I'm not really offending anybody but I'm only saying what is fairly obvious and you might still go on with your attachment to a church but it is just as well to see what is going on here, from a cybernetic stand point. I've written quite a lot about that.

So, there's viable structure.

Now what I want to ask you is this. I will eventually get round to this, of showing you what I call the viable system model, and this is a way of looking at this organisation. I have to give you all this introductory stuff because we need words like homeostasis, words like variety and so on. Now what I would like you to do, to maximise the effectiveness of your stay here is to choose out of the various options, we have had manufacturing, schools. There were others I would like you to choose four or five and subdivide yourselves into four or five groups.

Well there are only 13 of you so probably four is enough. I don't care if it's two but don't go below two because otherwise you go off and ....

Two

One is a group mathematically but not advisable socially so I believe
What I would like you to do is make a few groups and say well Lindsay might feel. Where is Lindsay?.. Gosh.. You escaped from me. If I feel that she wants to do school I think, Schools is a notorious one. That is, I am looking for something we can all understand.

There is no use in modelling the Klu Klux Klan unless we have someone here who really knows how it all works.

So we all know how schools work we know how manufacturing works.

Come up with another couple,

Try to come up with another couple.

Discuss this in the break.

And try and come up with a coherent structure to the group, that's going to look at this. Then I can talk and I can bring in all those points as we talk when we know what it's about. Because I would like you to go away with an actual model, a viable system model of something, and something you have chosen to study. Otherwise it is all a bit vacuous.

You want us to look at the structure of those organisations?

Absolutely, but I am going to lead you how to do that and that's what the viable system model is. But if we know in advance that you are going to be interested in manufacturing and you in schools.

No manufacturing.

I now pronounce you...Don't its on video here..

So could you please in the break come up with a grouping so we can begin to structure ourselves a bit

Do you want each group to choose 1 organisation?

Well two if you feel bad about it, I'm totally open here. I just want to know, to help the explanation of the model.....

My job is to convince you that the cybernetic approach to a viable system works, wherever you apply it. Certainly applies to the body, that's where it all started. It started with a mathematical model of the human nervous system, that I made many many years ago and, you see, the point is.. there are, to use a word, laws in nature which condition and guarantee viability. That is the thing I started on and with great respect to biology, but I never found an answer in biology, that is where you expect to find it but you don't. You might expect to find it in medicine and you certainly don't, because medicine is absolutely reductionist. I don't know if you have ever been in a position to be treated by four difference specialists physicians, but they don't interact.

I have just received, I am what is euphemistically known as a Senior in Canada, which means an old age pensioner in English.

I have just received a letter from the Minister of Health in Ontario which says "Twenty five percent of admissions to hospital in Ontario are Seniors, 25% of Senior admissions to hospital are due to mixed up medication". That is unbelievable, because one doctor said I'd like you take this and you'll be okay and another doctor said you get on this rack and it will stretch you, and whatever they have done and they mix up... So the Government of Ontario, which is very sophisticated and advanced I must say, has put in a system through the pharmacists which we call chemists, so they are all on a computer network to try and catch this poor old buffer when he goes in there. You see..

We've got it in England too.

You're right Dave, I've seen something about that, but where has it got us, this is crazy. What an indictment of medicine and everybody says aren't we clever, we can catch this out. How did it ever arise in the first place?

If you have ever read anything about Chinese medicine for instance, it couldn't possibly happen because you're treating the whole person. So again we find that this holism, reductionism dichotomy is very very serious in our society it really is. So you are going to do that for me and brief me..

Before we close this session I really do want you to come up with better, more fulfilling conversation about what is and what isn't the viable system. We started mentioning some viable systems on the ground that they survive. What isn't, for instance.

Not any old organisation is a viable system.

Try and think of one that isn't.

Would you say that British Rail is a viable system?

Of course it's a viable system. They are trying to stop it being a viable system by the minute as far as I can see, but it has been there for years and lets hope it stays there. But if you keep chopping lines off, you make it un-viable at some point.

It's a viable system as long as it has money pumped in to support it. The money doesn't come from the fares so in one respect it isn't a viable system if they privatise it, its going to struggle to be a viable system because there not going to have this money pumped in.

I don't think they have a hope. Now, where is the money coming from? You see...

Profits

Well take it easy here.. Where do the roads come from?

The roads and the cars and all this stuff, that Thatcher so liked. It's being paid for from the public purse in a concealed fashion. And if you start looking at transport as a viable system, you see that bumps it up a bit.

We started with British Rail now we talk about transport as viable, so we are adding various bits to it.

So what is the payoff between roads and rail?

And as soon as you start thinking about this you have revelations, honestly because I remember working for the Ministry of Transport in the 60's, and they said well why don't people leave their cars at home and catch the train.?

Now this is the kind sort of simplistic nonsense you get in to.

They don't leave them at home because they have got the car. They have made the investment in the car so that instantly this alters the perception of where the pay-off's are, because once you've got the car it doesn't cost you anything to go and sit in it. It's going to cost you for petrol but that's nothing compared with the rail fare.

Some things are immensely complicated and people will insist on treating it as if it weren't.

Now we have stumbled here on the final thing I actually hoped would finally come out of this conversation, and it's just emerging. Why did we go from rail to the transport system?

Rail is part of the transport system.

Is the transport system on its own viable or is the rail network part of greater?

Well that's an interesting question isn't it, after all people would still have to be transported if all the trains mysteriously disappeared. wouldn't they?

Is that why it works, because it's part of...sorry...working on the theory that people have got more cars, there going to carry on getting more cars so lets build more, more roads. Public transport is basically taking a back seat because everybody wants total convenience. What they're doing is reducing the rail network so that you have got less opportunity..

I thought they were really having a good look at that

Changing every year

Having second thoughts

It's a bit late you see because the Transport Lobby is entrenched and the railways are being undermined. The aircraft are in there with all sorts of constraints on them, so the notion of the transport system is more than the collection of the bits of transport, is what I'm getting at.

What is the same argument when you get to energy?

Coal.strikes

Coal, gas, electricity, nuclear where is the energy policy? We haven't got one. We've never had one. Now, what I'm getting at is the last word I want to put into this thing. I do try to ration the words. We have had black box, we have had homeostasis, the last word is recursion.

Now I have a law, never mind old Ashby. Which says that all viable systems contain and are contained in viable system.

Now we started with you as an individual.

What viable system are you contained in?

I don't know part of me is in a University.

So you're a student in a university?

So that is the next level of recursion.

You see what I mean?

Yes

But what else are you in?

Family.

Family, that is another level of recursion. Distinct. Not one containing the other.

You, are contained in the university. You are contained in the family.

Do you belong to a church? Perhaps you don't want to say!

If you did, you would belong in the church. Next level of recursion. Right

If you belonged to a political party.

So you suddenly get this extraordinary image of the viable system called you, at the centre of something like a sphere. Where your organs are part of you and you are part of the family. Something else is part of you and you are part of the church and so on. And there are hundreds of them that's why I call it a sphere, I think it's a nice model. It's amazing really when you start to think about it. And this linear causal chain that I was attacking yesterday, makes you pretend you are not that complicated because they say Oh well that's just me, you know.

And I have signed on or whatever you've done.

It's very boring but this rich thing like this sphere with no boundaries out here sort of shimmering away that is you. It's a purely scientific thing I said, and we are nearly into mysticism, because there is no limit to this. You are the centre of the universe. Everything else is bits and pieces of the viable systems of which you partake.

Isn't that exciting?

Now oddly enough this is exactly what Buddhism teaches, by the way, and that's not a church, so I can say that, not really. It's a philosophy rather than a church.

Well we ought to wrap up now so...

Don't forget, black boxes,.. homeostasis,....recursion is the key,...

Now when we resume we will actually assault the viable system head on Okay.