

Ranulph Glanville: A Conversation.

When I first met Ranulph Glanville at the American Society for Cybernetics 2005 Conference in Washington D.C. I was reminded of an essay of his published in the proceedings of the "No Guru-No Method?" conference held in Helsinki in 1997.

In a modified version of that essay, titled *Researching Design and Designing Research* (1999), I was drawn to his view of what I had intuitively felt was at the bottom of our present social predicament—that is the need to simplify. For example, we are faced with a complex situation in which we are destroying each other to say nothing of destroying the natural environment on which we depend and we simplify that situation by naming it the War on Terror.

In his essay, Glanville asks: "Why do we want to simplify?" To make the "continuum" of our experience de-finite, handleable within limited (finite) resources. ...So strongly do we believe in such simplification that, when we find discrepancies, we explain them away as errors, rather than a demonstration that simplification necessarily omits something. By this device, we maintain our theories. Theory formalizes the significance and necessity of pattern. Pattern gives us objects and recognizable behaviors, allowing us to predict, and risk living by our predictions.

Prediction, he says, is a means for extending the range of our observations and the patterns we have constructed—of pre-forming our worlds. Living by the assertion that pattern X exists, and because X has always happened it will always happen, we extend the range of application of the pattern to become a prediction, taking control of the future as a result of which we pursue certain courses of action. Believing something is constant leads us to stop thinking about it: it becomes habit. For instance, if I have a route I regularly use, it forms (and severely limits) my actions, and I treat it as causative. An accident leads to confusion and loss of control. My chain of causes has been broken.

Today, I believe, we are living what we might call "an evolutionary accident" that may

prompt us to understand a different way of thinking—a designerly way of thinking. So, in my rush of excitement at being able to talk with this man who has supervised research in the fields of Architecture, Cybernetics, Design, Conversation Theory, etc. at numerous Universities on almost every continent in the world, I began our conversation by asking him the proverbial mundane (and simple) question. “Just what is it that you do?”

Barbara: I have always seen you as an itinerant intellectual who is championing a different way of creating our world, someone most needed in today’s world. Just what **is** it that you do?

Ranulph: I help people develop research, particularly in the area of design. The problem with research and design is that there is no tradition for it. So, some people don’t want research at all, others want to pretend that what they are doing is research (because you can earn money from it). Others are confused and so what they do is they take the worst, hardest cartoon of scientific research, which probably no scientist would ascribe to, and insist that everyone does it that way. I have worked with people who have no experience in supervising and I am appalled at their interpretation of what is required because it kills all the imagination and so on. That’s why you have to find ways of showing that research doesn’t have to be this deadly, third person scientific quasi-objective sort of thing (although that’s appropriate and enormously valuable in certain circumstances) and help some people see that there are other ways of doing research. Then I supervise staff, I teach supervision and I supervise students and I advise them.

B. I’d like to ask you when you get in that situation where people insist that objective observation is the only way to do research, how do you do that? How do you approach that problem of bringing them around to a more cybernetic view.

R. It’s not a more cybernetic view. It’s a more general view. There’s a sense in which

we have allowed science to hi-jack our notion of what is proper, and we model everything on a very restrictive and “cartoon-like” view of what science is and how it’s done. And a great deal of the scientific machine and the propaganda that it produces promote this. Designers are not scientists, they are looking for something different, they are doing a different sort of thing. And there is a difference between what happens in science and the story that’s told about what happens in science. Yet people take the story literally. It’s important to understand the difference. What I have to do is to remind them that there are all sorts of people doing research—anthropologists, people in medieval times, doctors and most medical research and so on—which really isn’t done according to scientific principles or, at least, those cartoons. Science can be understood as being much wiser, a much more beautiful approach than they believe it is. And there are many other ways of dealing with research. Research doesn’t just mean doing that research which postulates an external reality that exists independently of us.

B. I was very interested in your distinction between the observer *of* and observing *in*. That’s an important area for research it seems.

R. Yes, if you are talking about designers. Designers are people who are involved in making things. The designer aims to produce something which is not a repetition of what has been done before. This is quite unlike the scientist who is trying to get the same results, or is trying to test the validity of those results. The designer is trying every time to make something new—that’s what designers do. People who are involved in making something new rather than being involved in just describing what is, have an interest in changing what is. They know that they are not standing separate from but are actually involved in the activity. So if you are a designer and if you are studying design you need to face the question, how can I act on this without involvement?

Actually the way you do design is an active experience. You don’t do design remotely. The great trick of designing—which is sketching—is a trancelike activity. This is an experience. It’s something that you do. It’s not something that you

describe. If you want to do research which will help design, then it needs to be a research that recognizes the position of the designer not as someone who studies, but as someone who acts. And so I am interested in the emotion of the observer, because that is the act of the observer. And that's the cybernetic observer.

When I talked about this at the ASC Conference, someone made a point that I was still talking as an observer of. Thinking about it, they were right. Of course, the difference is what I was doing was not creating an experience but creating an explanation. So I was always in a sense standing outside the system. When you are inside the system you are talking about experience and of course it can only be shared by those within the system anyway, which is why very often when I present papers I actually try to create an experience or an explanation within the experience.

B. And that gets us to conversations. I have been very interested in the World Café movement. Juanita Brown did her dissertation at MIT on the idea of the World Café in which people come together in small groups around café tables where they feel comfortable enough to communicate things a lot deeper than they would ordinarily communicate—how they really feel about things—and questions get brought up about socio/economic/political situations. What I am interested in, is that it has become an international movement and it seems to have taken off like “wild fire” just by itself with an energy of its own. You have studied with Gordon Pask. Would you talk about how that relates to what you were just saying about being able to experience rather than just observe?

R. There are certain things about conversation that are truly astonishing. Let me first describe what conversation is in the sense of Gordon Pask—or in my interpretation of Gordon Pask. I don't think he would be very angry at my interpretation. He knew when he was alive how I described it.

A conversation is a circular interaction between two or more participants. What's important is that it's an interaction. Let me insert a little aside here. There's a sense in which there were people doing second order cybernetics which recognizes the

inclusion of the observer before second order cybernetics was made by Heinz (von Foerster). Gregory Bateson never talked about second order cybernetics simply because he was always doing it. In a sense, Gordon Pask was also doing this because Gordon's earliest work, the earliest machines that he built, were truly about interaction. One, "MusiColour", was an extraordinary machine which was a video synthesizer that received information from a musical quartet that played on stage, and would consequently flash colored lights. Everyone has seen that, since the sixties, these things have become very popular. What was different about Gordon's was that his lights flashed by building a model of how the performers were playing. And if it didn't have to change that model it went forward and would start flashing to entertain itself. So if the musician stayed too much within one sort of mode then the machine would start playing a different mode and the musicians would respond to that so that MusiColour became the fifth member of the quartet. Now this machine is really quite astonishing. Nobody as far as I know has achieved anything like it even up to now. And this machine was truly interacting.

What we have come to call interaction, the way the computer guys speak, is to over-inflate everything. So, rather as you Americans seem to upgrade all types of typists and secretaries who we now call personal assistants, we have inflated so called multi-media (actually a homogenized mono-medium); just as we have inflated action and reaction, calling it interaction. Action and reaction is all it is. All reactions that the machine will display to your actions are programmed. They are determined. They are within a deterministic framework—but they happen so fast that you believe they are not. And that's actually good enough. Why shouldn't interaction be what we believe as a result of we perceive?

This is a curious way I am talking. Interaction is something where you have intelligence shared between, where each brings something which contributes to a constantly wandering whole which isn't attributable in any analysis to one or the other in any deterministic sort of way. So interaction is about constant surprise and "new" and so on. What Pask did with conversation allows that.

Let me explain how it works. First of all, the premise of the conversation is that each of us constructs meaning in our own heads, or wherever it is we have these meanings. We make these meanings, ourselves. It therefore means (which is a word I should not use here) (laughs), it therefore implies that we cannot communicate by means of a code. All that code-based linguistics, all that semiotics and semiology, is not really part of this Paskian world. We don't send a coded message. I will give you a good example. Politicians, at least in the UK, say "I have made it perfectly clear." What this indicates is that they have not made it perfectly clear otherwise they would not need to insist they had, since they would have been understood. But, crucially, it also indicates that they misunderstand the responsibility for developing meaning. They think that they are communicating meaning, meaning using a code of language, whereas it is actually up to the listener to create the meaning depending on what he or she hears or sees or senses. The important thing about a conversation was that each participant creates their own meaning and these meanings cannot be communicated: they are private.

That would be a desperate situation were it not for what Pask offers, which is conversation. What he says is, "I conceived something." If I had a blackboard I might draw a picture of a tree and then I would say to you, the word "tree" and you would, presumably, hear something (what exactly you hear we might later discover, by means of a lot of conversation). But anyway, something-or-other occurs within your field of awareness which you attribute to me. You listen to this and you wonder, "what concept can I construct that goes with what I am hearing? In other words, how can I understand this?" So you might, indeed, make some mental model, which you draw on the blackboard—instead of it being an oak it might be a spruce tree. (I call it a tree because I'm explaining this in the (negotiated) public domain: but that's not part of the conversation. Don't let's get distracted by this, please).

Next, you want to check with me that you have understood what I have said.

What I mean by saying you have understood what I have said (in this Paskian context) is that you have built an understanding of your own which, by your attempts

to communicate to me, I find doesn't clash with what I had built as my understanding—and tried to communicate. So you say something back to me. (If you repeat "tree" it's no help, because that only shows you can imitate me). You say something, let's say (in my example) "arbor" (which happens to be Latin). I hear this and I think, hmmm, and I make some (further) understanding from this, and I now compare the understanding I made from what you say to the understanding I was working with initially. I compare them and ask myself, "Are they alike enough?"

If they are alike enough, I decide you understood me. And if they are not, I say, "No, what I meant was ... I didn't mean a conifer. I meant a deciduous tree." And we would go around the circle of exchange again, saying, perhaps, you think of something maple-like instead of spruce-like. This process is a way of reducing error and we now have a way of communicating that doesn't involve the belief that we communicate meaning but rather each participant creates their *own* meaning. What is communicated is not the meaning. What is communicated is something which allows me to build my own, "second" meaning, which seems to be close enough to the first for us to agree that circle is complete. And thus I can take it that you have made an understanding which is going to work for you like my understanding does for me.

B. That sounds to me like neutrality ...

R. In a sense it is. However, what I call "mutual reciprocity" is intended to be something a little different. When you draw a distinction, there is a question of what quality do you attribute to each side of the distinction. What I felt was needed was to say: if I draw a distinction, then every quality that, at the time, might attribute to one side might also be attributed to the other. I don't mean it has to happen, just that the possibility has to be there. For instance, if I draw a distinction between you and me, and I say you are a woman, and I am a man, there is the potential in that distinction that you would have been a man and I would have been a woman. It doesn't have to happen, in this case it didn't happen, but the potential is there. The qualities that I can attribute on either side, for instance, gender or being people or whatever, these

things might possibly exist on each side. That's the point, they *could*, I am not saying that they do but they *could* exist. This gives you a way of reflecting yourself into another. So it allows me to see a possibility we might understand if I draw the distinction between you and me: I say I can have an understanding, so then I say it's possible that you could also have an understanding—we could *both* have an understanding.

There is a reason this mutualistic mechanism was important to me in the first place, and I'll try to explain. If you make a statement like, "I know this," in which you are predicating a universe on the notion of knowing, the question is how is there an "I" that enters this universe? And that question turns out to be part of this matter of mutuality, which goes right back to my doctorate with Gordon Pask, examined by Heinz von Foerster.

When I say, "I know this," I am implicitly saying, "I know I know this," because I am predicating everything on knowing, so I must also be a predicate of knowing. And then you have to ask, "Why should this (in "I know this") be any different?" This is also, in this way of speaking, an inhabitant of this universe—a universe on knowing, of other things which can be known—including you and me. In which case, this (other) must know this. So it is predicated on the notion that if I say "I know this" I am implicitly saying "I know I know this know(s) this:" which involves two self-referential entities. It is the self-referentiality which allows you to talk about them as being (having an autonomous existence that can be treated as separate from oneself). It is essential to be able to be explicit about the notion that if I am a self-referential entity, then I must be able to treat this as a self-referential entity as well: to assume this know(s) this. If I make my entry conditions that I am self-referential, then this other must be treated as self referential, too (which is, I believe, a prerequisite for a conversational partner), leads me to my particularly clumsily named, "Law of Mutual Reciprocity".... By saying there was something nice about tripping over it, not quite being able to say it easily ...

B I am fascinated because it enters into the impulse for conversation because it

strikes me as it raises the need to be able to check out the other self referential. I feel as if I am back in the beginning where two cave persons are experiencing each other and are discovering language.

R. That was the purpose of my Ph.D.—not that I knew what it was about when I finished it, so when I tell students they have to know their research question, I have always to pinch myself just a little because it took me 30 years to discover my research question! (But then, I argue that design is an activity where the solution finds the problem; and not the other way round.)

B. When you think in circularity you get into this sort of thing, holistically.

R. Yes: what I am trying to do is to find a structure that allows that each of us understands our world differently but we each of us are able to pretend we are talking about the same thing and that's a crucial question. It's essentially the conversational question. For any of these circular systems, any forms of self-reference, I maintain that this is a very fundamental question indeed. It's as fundamental as any of those other questions in cybernetics. And you are right, the thesis itself is written as something which is astonishing It's so abstract that, in a funny way, almost no one can read it. It's terribly short and I wrote the main body in one 15 hour session after doing a lot of preparatory work which, however, is incomprehensible. And now when I look at it I am always astonished by it. You can see it as dealing with things such as the first attempts to communicate. But I have to say the communication part is taken directly from Gordon. To go back to conversation for a moment, once you return to a long description of how conversation works (of the sort I tried to talk through above) it becomes possible to discuss how conversation always brings novelty through the notion of interaction, which is what Gordon did all his life, right from his earliest research in 1952.

What you get from conversation is this. If each of us understands the world differently then what we say back to the other person is, inherently, going to be different: it is going to come from your meaning which is not my meaning, and,

therefore, there will always be a certain disagreement. Language will do a lot to hide this, to smooth it out, especially language as we use it which is sort of like a club entry fee—you have a joining fee for a language which includes an agreement to use it like everyone else does. In that sense, language is a social system. Language as studied by linguists does indeed have us use it as a shortcut; and it is a shame we don't remember it's a shortcut for the construction of individual meanings. So what you bring into a conversation is exactly not what I bring and therefore every time we communicate there is, in effect, the certainty, if I'm prepared to see it, that you are bringing me something other than what I already have—so there is always a gift of novelty (for me) that comes from you; and there is always a gift of novelty from me that goes to you. And so, when we have a conversation, there is always something new coming up and that is not only a way of expanding and getting ideas ourselves; but it's also why. if you sit down and have a conversation with somebody, then, unless it is completely scripted and it's not a conversation at all, it's an interview and it's directed, the conversation will end up in places you never imagined.

Now just one more thing about conversation, the way that I described it is of course very pedantic, and very tedious and slow. If we were really checking every meaning in the way I described, we would never get anywhere. We don't have to do this, we learn that we can let things slip a bit and just at certain points in the conversation you will stop and say, "Now hold on a minute, let me check I have got this right," And that's how we really test a conversation. You can let things go in a sort of free-form way. The conversation expands a bit, and then we have to sharpen up and say, "I need to do the error regulation, checking that my understanding is like yours and I have to do that precisely" and we say, "let me just summarize what you've been saying and hold on a minute, have I got it right, what you are saying?" So all these little things are our way of making sure that the fluidity that we have given to each other and the benefit we get from trying to understand the other works so we actually do benefit from the gifts that are on offer, to make sure that somehow or other we are not actually diverging—so that, in the end, there will be no conversation.

B. It's like circles within circles, the circularity moving yourself. It's very interesting in

the world today because I try to relate all this new understanding to how it can help us in creating a better society. The need to be able to communicate with people who think entirely differently from you, like with the radical fundamentalist, is becoming a social necessity in the United States. Could you relate what you were talking about to an actual conversation between a Christian fundamentalist and a liberal agnostic.

R. Well, let's go back to that law of mutual reciprocity and apply that to the conversation. The law tells me that everything I believe for me I have to believe also for you. So that all the good I can think about me I must be able to think about you and every bit of good behavior that I expect from myself I must also be able to expect from you and every bit I expect from you I must also expect from myself. I think that there is an important ethical dimension about this law. And what happens in a conversation is that you have to respect the difference with the other. You have to respect that their meaning is not yours and that you cannot force your meaning on them (any more than they can force theirs on you). Code thus becomes a very specialized form of conversation in which you reduce the circle of conversation so it becomes, in effect, just a line. It takes about three months to convert your average teenage boy into an unthinking programmed machine that belongs to the armed forces or the police or whatever. These (paramilitaries) are people who use language in order to communicate very quickly an intended action so if you say to someone "shoot" you don't want to negotiate what you meant. So we have the destruction of the individual and the individual meaning. That's the whole point of coded communication, of course.

As I see it, you need conversation in order to be able to set up a code: otherwise you are just shouting at people and they don't understand. If you agree with me, you will thus find conversation (rather than coding) is primary in communication. The problem is, I think, that this understanding is not generally shared. When you talk about fundamentalists, you are talking about one of many groups of people who believe they have the right, and that this gives them the right to act on this in any way they chose, believing only in the value they hold and not in any form of mutuality. They believe there is a code, and they believe their meaning is communicable and it is

given by God. Of course, it has authority and it is communicable and it should be communicated by being forced on those who don't understand, don't share this view (I'm speaking ironically). I don't think that there is much we can do which will fight this because their view fails to acknowledge and act on anything to do with conversation. I think that we, as a society, have actually gone a long way down the line to facilitate this way of behaving by talking about key meanings and so on. But there is one thing we can do and that is to refuse to give in.

B. Describe that, please.

R. Well, that means refusing to play their game. It's refusing to become absolutist. It's maintaining what I will call our own ethical stance. Ethics and morality are words that I don't generally like to use. I feel uncomfortable with them. But I feel more comfortable now about ethics, in contrast to morality, which is telling people what to do. In some sense the terrorists have already won because we have started treating society not as a liberal democracy and, certainly, not based on trust (consider surveillance, and so-called security measures). We treat members of society more and more as untrustworthy and as needing to be told what to do. We are losing our freedoms, and we have politicians who are very anxious to take them over. Very often politicians are like that because they want to be in power and rather than to serve.

And so in a sense we are in the process—or we are well along the way in the process—of losing the freedoms and the qualities of society that the terrorists and the Christian fundamentalists and all such people reject, which it seems they most object to—which we like to think characterise our western way of life. We are just playing along with them, which is appalling, and in so doing we distort our values and buy into theirs.

But there is one thing, and that is the compassion. We believe in the importance of compassion, that we have to keep showing it. We can resist by refusing to participate, by refusing to become part of that way of being and doing things. And,

since you have just mentioned world cafés, that is perhaps a way of doing this because they provide a place where we can react openly and trustingly.

I remember being at a conference not so very long ago where someone said, "You know, one in a million pedestrian journeys ends in an incident. This is awful. We have to protect ourselves. We must be very careful, we need new laws!" And so on. And I thought: that means 999,999 journeys end in no incident; and you are prepared to damage all of our lives because of this one incident. You are prepared to live in fear and to restrict yourself, to behave in an awful manner, to be totally miserable because of this? Of course, for the one person who suffers the one in a million incident it is dreadful. Of course for the relatives of the people who die in terrorist acts and of course those people who die, this is an enormous and terrible catastrophe. But it's a personal catastrophe and it belongs to them. We are all going to die and we don't know how and when. I am not excusing terrorists or any other group, but I think we have to be very careful of allowing them to call the tune, to set the agenda, which is what they succeed in doing because we take these isolated things, the one in a million, and we allow our lives to be dominated by them. That's why terrorism works.

B. There seems to be another side of it also. The people who want to control will use that in order to control.

R. Yes, of course, I don't know about it here in the United States, but I have experience in England and in Australia, where I work quite a lot. The Australians have suffered, as you know, what we regard as major catastrophes from bombings in Bali and they have arranged national memorials to the people killed in those events. But these are people who were there having a hedonistic holiday and who were very unfortunate in that they got bombed. It is wretched for the people concerned. There were four people who died in the latest bombing just a couple of weeks ago and an entire industry is developing around "Australia Mourns." That sort of thing is often a way of acquired glamour by association with someone else's personal catastrophe. In Western Australia they have done one of the most inappropriate things of all (I will

lose friends for saying this). In Perth there is an enormous, very moving park which is a war memorial for the men who went to Europe in the First World War: avenues of trees with one tree named for each dead soldier. You think of these young guys going half way across the world to fight the war, giving their lives for beliefs about how the world should be, an ideal for humanity, fighting in a place they didn't know and against an enemy they didn't know. This is selflessness. The avenues meet in a memorial that looks out over Australia, on top of a cliff above the Swan River. Next to it they have built a memorial to 20 kids killed in Bali a couple of years back, who were having a good time on the cheap in Bali when they were unfortunate enough to be blown up. These kids are being honored as heroes, indeed they are universally referred to as Aussie Heroes. I really am not attacking the kids nor am I attacking the families. I think it is awful what happened to them, as is any premature death or death by violence. But I think, also, that when we start treating this sort of event as a national disaster and convert these people to martyrs in the way that we convert people who gave their lives fighting for what they felt was freedom and a better world they believed in, we really are behaving in a very inappropriate and rather sick way. The kids who were killed were not heroes; they were unlucky.

However, we make a meal out of this. We turn what is a small, local event (a horrible event) into a major event on a global scale. And who benefits? Our maudlin side gets fed—which isn't healthy. But the real beneficiaries are those who use this to take more control (in the non-cybernetic sense) and further reduce our freedom. And that's not the terrorists, but our own leaders and their trained executors, the paramilitaries.

B. We need people like Joanna Macy who is a systems scholar and a Buddhist and who works in the community with people to help them feel the pain in order to be able to go beyond the tragedy so they can be active in changing our situation. Juanita Brown, whose PhD from MIT created the World Café movement we spoke of earlier, is another such person. These are the kinds of people I also like to highlight in the pages of the ASC newsletter, PATTERNS, so that bringing academia and activists together to create a holistic view of our present situation strikes me as what

“Patterns” is all about. I like to think we are creating a sociological understanding of what Bateson called “the patterns that connect.”

R. Sometime people who come from certain disciplines have a great blindness toward what other people do. I have come to believe that cybernetics and design are essentially the same thing. That the process by which design has worked is the essential process of a cybernetic system which is circular feedback, circular causality in biological and social systems, as the Macy Conference title tells us. To dismiss design education is, I think, to show a certain narrowness. It’s like the way that the academic world has been unable to deal with the notion of research in design because it doesn’t look like science. We talked about that in the beginning of this interview: there is a different type of knowledge, a different way of dealing with the world which is about action instead of understanding. The question as to whether you need to understand in order to act, I think is very, very open.

I remember John Frazer, a student with me and who had an educational background not so different, and is one of the fathers of computer-aided design. From a very early stage he said that he really couldn’t see a single argument that anyone had produced to sustain the notion that you must understand first in order to act. And there are those who would say that you must act in order to understand.

B. Is it a circular process?

R. Well, it could indeed become circular but it might be that without an action in the first place it is inconceivable that there might be any understanding. So you could try telling the story the act-to-understand way, whereas we have an epistemological tradition in which you have to understand in order to act. Now that’s very, very bizarre. I think the moment we stop thinking that way, we will find it easier not only to recognize design as a universal activity, but to recognize cybernetics as the way of formulating and describing design, explaining what it is that we do and looking at it so we can understand it, and thus we will understand what cybernetics does better.

B.and what it is.

R. It is because of what it does. It is, I think, a little bit like my argument about intelligence. My interest in intelligence is not to specify what it is, but to say where do we find it? And I think we always find it "between." We don't find it "in." We find it between and as a result we attribute it and try to position it.....that I see is where intelligence happens. It happens in things like this conversation. Without this conversation there isn't intelligent behavior. Intelligence is always the result of an interaction which may, however, on occasion, be so weakened in it's feedback as to be treatable as if it were just an action. That's why I think circular systems actually have priority over linear systems. The linear system is a circular system with weak feedback or feedback we have planned and chosen to ignore. This was the clever trick of what I'll call Newtonian Science although, interestingly to me, the method of science was, apparently, first formulated by Joseph Glanville in 1670, or there about.

B. An ancestor of yours?

R. We all go back to a little village in Normandy and of course Normandy isn't French, it is Viking, so the name Ranulph is a Viking name.

B. It certainly is obvious that you spring from a line of great Explorers and I thank you for taking me along on this journey.

Ranulph Glanville studied at the Architectural Association School in London in the sixties and early seventies, where he was mainly concerned with electronic performance music. On completing his studies he was sucked into teaching, mostly architecture, but also art, graphics, design, research methods and cybernetics at Cambridge University, the Architectural Association, University College London, and the University of Portsmouth. He has helped supervise doctorates at a number of other universities, has been visiting professor, lecturer and critic on 6 of the world's 7 continents, in a wide range of subjects.

He gained two PhDs: the first (with Gordon Pask) in Cybernetics; the second (with Laurie Thomas) in Human Learning. He has just been awarded a DSc in recognition of pre-eminence of his research contribution which includes over 270 publications. He is on the editorial board of several journals, the committee of more conferences, and is Vice President of the American Society for Cybernetics. He has also been a chef in a highly regarded restaurant.