

## **Transcript of the 2nd Dennis Rosen Memorial Lecture Royal Institution 28th June 2001**

**A dialogue between Richard Gregory and Howard Hodgkin, chaired by  
Professor Lisa Jardine**

Introduced by Lisa Jardine — Professor of Renaissance Studies at Queen Mary College, University of London. Lisa is a Trustee of the Rosen Trust and is an author and broadcaster who has published *Ingenious Pursuits – Building the Scientific Revolution* and she is currently working on *A Grand Scale – The Career of Sir Christopher Wren*. She is an honorary fellow of King's College Cambridge.

### **LISA JARDINE**

Good evening everybody. I'm going to remain seated here because we're going to pretend that we're in an extremely intimate conversation, on which you are simply eavesdropping. Those of you who are eavesdropping from a great height, forgive us if we don't look up often enough.

Let me start by saying something about the Dennis Rosen Memorial Trust who are, with the Royal Institution, the joint sponsors of this evening's event. Dennis was a distinguished biophysicist and many of you here knew him well and I can see people who worked with him. The shared passion of Dennis and Sylvia was the bringing together of science and art. And at Dennis' death, Sylvia and the children devised the project of a Trust which would keep that enthusiasm going.

If you are passionately interested in science and art and their intersection — of the kind that you will listen to tonight — then you will know the kind of excitement that the beginning of the 21st century is bringing. Encounters between the greatest of artists and the greatest of scientists are producing, let's be trendy, a third way which brings those together and takes us into an intellectual future. If you are interested in that, then please give to the Trust because these events depend entirely on monies raised. We will think of great funding events in the future but at the moment it is your personal largess that will allow these events to continue.

So let me go ahead to tonight's event. Tonight's event is a perfect example of exactly what Dennis and Sylvia Rosen were interested in. I will start by introducing Howard Hodgkin, then I will introduce Richard Gregory and then we will embark into our conversation and forget that you are here. My job is just to

keep them from fighting one another or getting too cosy. And at a certain point, when I judge it appropriate, I will bring in questions from the audience so if you start fidgeting I'll know to bring you in.

It gives me great personal pleasure to be introducing Howard Hodgkin whose painting I have admired for I suppose as long as I've admired painting. He was born in England, spent the war as a child in the United States, returned to England and so is truly a British painter in the grand tradition. He won the Turner Prize in 1985, has been a Trustee of the Tate, has been ennobled, though we will pass swiftly over that, and is simply at the present time (I think he was made an honorary doctor last year) — he may have become a national institution.

The topic tonight, as you know, is Seeing Red, Colour and Perception and let me just read you, before I pass to Richard Gregory, a wonderful quote by Howard Hodgkin which I think sets the stage beautifully for the kind of encounter we're going to have. Howard wrote in 1995 — "Why is colour so difficult an idea, so verbally otiose? Most colour theories are by their very nature somehow ridiculous. It seems almost impossible to talk about colour rationally or sympathetically but nothing for a painter can compare with its infinite possibilities, its infinite seductions." And so in a sense the question I think that Howard is bringing to Richard tonight is where does that idea of the somewhat ridiculous idea of talking rationally about colour and the specialist in perception. Where do they come together?

Richard Gregory is currently Emeritus Professor of Neuropsychology at the University of Bristol. He is also part of my personal past because as a small child, no as a teenager, my father gave me Richard's book — Eye and Brain. In particular I have pulled down my copy with his signature in it at home and Richard's experiments with optical illusion and the illusions of perception. They let me understand the way that perception and vision worked in a way that was totally accessible and totally comprehensible. Richard has also been heaped with honours which again I have to pass over apparently. The thing I really like about really distinguished people is that they don't want you to parade their honours. When someone gives you a list of honours it means that they are not as distinguished as they make out. These are the Lisa Jardine truisms for tonight.

According to Richard's website, the University of Bristol, top of his specialisms is experimental study of human visual perception with special reference to phenomena such as illusions for investigating brain strategies. Theories of perception — especially developing a constructive knowledge-based account — and he's always been passionately interested in artificial intelligence which will be a topic of the Dennis Rosen lecture next year, we hope.

**RICHARD GREGORY**

I will just speak for about five minutes and I would like to start with my personal logo, which is this. Actually I keep this in my office on my papers. I think the question mark should be the logo of the scientist and the artist. I think we're linked, actually, by the hook of the question mark.

## **HOWARD HODGKIN**

Undoubtedly.

## **RICHARD GREGORY**

Good, excellent. Now I'd like to make just one or two remarks about perception itself, that's not specifically colour but partly colour, John Locke realised that there are no colours in the external world at all. There are wavelengths of light, as we now know, which stimulate the eye and brain and colour is generated in the brain, actually in a specific region, really in what is called the four which has recently been established about ten years ago, that a particular region of the brain has cells in it which generate the sensations of colour. Though only generated in certain animals — humans, primates, not in other mammals (they don't have colour vision or only very, very rudimentary), birds do, fish do. It's been reinvented in evolution about six times, with different kinds of colour vision.

On the whole, what colour vision seems to be for, and one has to think of perception as biologically developed through evolution for survival — and, obviously, we survive more happily and cheerfully because we have artists who produce pictures which is great — but that wasn't, obviously, the original significance of colour vision. I'm quite happy that you have superseded the original need for mere survival with your wonderful pictures! Originally, in primates, it was almost certainly evolved for eating, for knowing whether food was edible or not. And if you do the experiment of taking black and white pictures of food, it's really jolly difficult to know whether an apple is edible or not. Colour is very important. Colour is not good for recognising shapes, forms or movement and if you have pictures with only colour and no brightness differences, one really sees remarkably little.

The other main point that I think I'd like to make about perception which follows from that, is that it is very much projection from the brain into the world. In other words, you get light obviously coming from the world into the eyes, but psychologically we project a great deal of what seems to be simply out there by the brain projecting psychologically into the world of objects and the world of objects as described by physics is really jolly different from the appearances that the brain projects into it.

If I could have the lights on for a moment, and if you would like to look at something nice and coloured, such as our Chair lady, and then do the following experiment — which you've done millions of times, but possibly not seen as significant. If you look at her and think how nice she looks and shut your eyes and imagine her. Now I'd like you to compare the imagination with — open your

eyes again — what she looks like with your eyes open. Now I don't know about you and don't know about a brilliant artist like Howard, but for the rest of us humanity, the memory is much, much fainter than when you've got real-time signals coming in from the eyes into the brain, which we call technically afferent signals.

### **LISA JARDINE**

Wonderful. Now if we can move you forward a little so that you just turn toward Howard. You can forget about everybody else now because I'm just going to try to get the two of you started.

Now I want us to come back to that memory point but I don't actually want to start there. Or rather what I really wanted as I was listening to that and I kept wanting to sort of whisper in your ear — but that would have been rude — does any of what Richard has been talking about matter to the artist who is, like you, preoccupied with colour?

### **HOWARD HODGKIN**

It's far from being the only thing that I'm preoccupied with. I am interested in what you say about colour being affected by memory because for an artist using colour you have really the entire, or any European artist has, the entire history of Western painting in the back of his head while he is painting his pictures and while he is making use of colour. And I don't quite understand why colour is only real now or maybe I misunderstood you.

### **RICHARD GREGORY**

Well, I'm suggesting that one has to think of perception really for survival. Basically, that when you're crossing the road, it really matters if the lights are red or green, that's what matters for survival. So, the past is needed in memory to give significance to the present moment; but what is actually happening at this moment determines whether you're going to live or not every time you cross the road. So that, what you're saying about colour is absolutely right, but the immediacy of the present moment is essential simply to survive into the future.

### **HOWARD HODGKIN**

Of course I completely accept that but I don't entirely understand why colour is meant to produce a dimmer effect when it's not a traffic light.

### **RICHARD GREGORY**

Ahh, well my suggestion is that we're being confused between the past and the present. That the present consciousness is really to separate it from memory.

### **HOWARD HODGKIN**

So that a painter painting a picture which depends on the use of colour which is really a language and I think a real one that can be described, not that I'm capable of doing that. It has grown up through a communal memory from

certainly the last 600 years is not nearly as vivid or real as the piece of paint that is put on now.

### **RICHARD GREGORY**

What I'd like to suggest is that when you paint your painting, you're really evoking your past, your memories, into the present — because the eye has now got signals at the moment while you're looking at the painting, but they're indicating the past experience, so you are making the past live again.

### **HOWARD HODGKIN**

I completely accept that but there is a kind of grammar, the use of colour, and long again in rather fatuous quotation I said that blue in certain circumstances recedes now just as it did in the fifteenth century and this is the part that I don't understand from what you're saying that the validity of the relationship of colours to each other is to a large number of people when they look at works of art, I don't mean mine I don't mean works of art that are made now what about works of art that were made a long time ago.

### **LISA JARDINE**

So could I interject here. That is an interesting move beyond what you were saying, that there is the impact of the colour now and the memory of the fainter colour of the memories, of the colour before. Howard is suggesting that there is a shared history. So it isn't exactly your own experiences — a historic, cultural experience of certain colours having certain significances and that we build those. Is that correct?

### **HOWARD HODGKIN**

Yes — that is exactly what I mean. I would love to paint pictures which were like traffic lights. I would love to have that effect on the spectator. That they thought that this was life or death. But I don't think it does work quite like that.

### **RICHARD GREGORY**

No, well I don't think it should. I mean a traffic light is important because your actual survival depends on getting that right. When you are invoking memories with a picture, one has the luxury and the liberty of floating around in your mind through time, through your own past. And indeed through the history of art so that when you look at the symbolism surely of paintings in the National Gallery, you are looking at the symbolisms previous artists have used, and all that is enriching your idea looking at the picture. It is much richer than I have said. I was trying to give a sort of basic point.

### **HOWARD HODGKIN**

No, I understand that. I just don't quite understand how you would in terms of what you know, and which I only feel instinctively about colour, about its function. It seems to me that there is an enormous gap opened up by what you have said. Between, what to me, is virtually a language, like a written one, of the use of

colour over the past centuries and this sudden and I think wonderful, and much to be hoped for physical impact, that you have described. I think that there is some other sort of half way house because the identities of colours as you suggest, red stop — green go, exists in terms of pictorial construction, pictorial space, in the way that still even now enormous numbers of people respond to. The shape that the colour are, the proportions or fill, however you would like to put it, and their relative scale, their relative quantity, between one colour and another is, I think a common language understood by enormous number of human beings without actually being so far described.

### **RICHARD GREGORY**

Yes. I have looked up the science of this and, its really terrible. There really is very little scientific work on colour preferences which makes much sense. There are cross-cultural studies with some commonality between different cultures. There are certainly fashions in colour. It looks as if when scientists have done an experiment on getting people to ask what colours do you like in order — blue, green, yellow for example — it depends on the fashion at the time. You do the same experiment ten years later and you get a different ordering which seems to be related, actually, to fashion. So there is certainly a cultural component here, but there is also of course a biological significance, that red obviously represents blood, it represents fire. Green represents grass, peace, quite this kind of thing. Now is it the biological significance of colour that dominates in painting, or is it the cultural plus the history of art and the way it has been used?

### **HOWARD HODGKIN**

I am not qualified to say whether it is biological but I would certainly think that the history of art, which is not, as you yourself were saying, been, as far as colour is concerned, particularly tabulated or described but, and I am certainly no historian on colour, but it does go beyond fashion.

### **LISA JARDINE**

So let me introduce one. We could take blue. Since you use blue. We could take blue which is introduced into sacred paintings with Lapis Lazuli which comes from the East in the 13th/14th Century and is ground up. It is the most expensive pigment and is therefore used for the virgin Mary s frock and becomes and is specified in contracts as the most expensive pigment and only a certain amount is allowed for a painting. Now as I understand Howard, the fact that we find an intense blue moving, even if we haven t been to the paintings in the National Gallery, must have something to do with that which is somehow more than fashion, isn t it?

### **HOWARD HODGKIN**

Yes, much more. I think these things are far more continuous than that would suggest. Red, for example, has been the colour of hell fire for a very long time and not only in our culture. It is also sense as well. It is also vulgar for that reason

as well. Red is very vulgar, even now. Unless it is used with great care. Sunsets are still thought to be very often beyond the bounds of good taste.

**RICHARD GREGORY**

I didn't mean it was only cultural. I think it is probably a cultural factor. This is why it is such a complicated subject.

**HOWARD HODGKIN**

I agree completely.

**RICHARD GREGORY**

Do you think that if one is an art student one can do the experiment very easily. If one knows about the history of painting, does an art student who has been through an art college and learnt the history from Ernst Gombrich, or somebody like that, do they approach pictures differently than the rest of us?

**HOWARD HODGKIN**

No, I don't think so really and I don't think that Ernst Gombrich was very good at colour. I'm very glad you asked that because artists probably don't have nearly enough contact with their audience, but I am always amazed how much people can disentangle without having been to art school. Perhaps they are better off in a curious way as they can disentangle pictorial space. They can see patterns of human emotion which are expressed in a pictorial space which is probably mostly constructed of shape and colour. So the sensibility of uneducated, and I don't mean this in any prerogative sense at all but simply that uneducated people looking at colour is, provided they can somehow get in touch with it, very powerful, very precise and very discriminating. I mean that in the sense of being precise. It is a very precise instrument and I am not at all convinced that going through an art college and reading about the history of art and seeing a lot of colour transparencies of pictures over the years helps us along very much. Once people are aware of colour in nature and accept, unqualified by what you said right at the beginning that colour doesn't exist, because to me of course that would make life very difficult. The generality of people looking at green grass see yes green grass.

I knew long ago a wonderful teacher of teachers, somebody who trained teachers for primary and nursery schools, and one of her cleverest ways of teaching children about colour was to immediately say well this is would you say the colour of ink or the sky at night or perhaps the slightly different colour of a plum. Is that brown the colour of camp coffee? Or is it your shoes, and they would go on like this being asked such questions and people would then observe colour with considerable exactness. Certainly, as the same woman used to say, imagine you are choosing something to wear. Even with very small children that seemed to get through.

**LISA JARDINE**

What I am hearing here is that we are getting precision from Howard. I love this sense that colour is precise. But what Richard gave us in the introduction was that, as it were, colour like other perceptions is an illusion and, I would somehow like us to take that forward. I would like to know what your sense is, as you listen to Howard, as to what it means to be precise with colour.

**RICHARD GREGORY**

I think I would like to raise the importance of context. Colour in one context is okay and in another it is not. Can you really divorce it from context? What happens in painting? Do you think of a colour as a colour that you want to use, or just within that context: is it the colour to use, or what?

**HOWARD HODGKIN**

All colours exist only in context, as far as I m concerned. There is no absolute. You don t actually see red unless one is very angry or very sexually aroused, and those are both contexts.

**RICHARD GREGORY**

Would you allow me to put a couple of your pictures on the screen, or not?

**HOWARD HODGKIN**

I think they would be irrelevant but do if you like.  
[Two pictures are shown to the audience]

**RICHARD GREGORY**

He says the names are very important — that is bleeding — blood. They are certainly incredibly evocative colours. Bamboo. I like Bamboo very much. The use of painting over the frame is very interesting. He said once that he paints over the frame so that somebody doesn t steal the frame and use it for another picture!

**LISA JARDINE**

I think we should stop now. If somebody was reading my words, I would cringe.

**HOWARD HODGKIN**

I m not cringing, I just think they confuse the issue.

**LISA JARDINE**

But I do think it is helpful as there will be some people here who don t recall, or perhaps a lot of scientists won t recall, your paintings.

**HOWARD HODGKIN**

Well I think that is all to the good. I am here to talk about other . I m not here to talk about my own pictures.

**LISA JARDINE**

So, as it were, we have the practice of the application of colour. We have the practice of accounting for the way that we engage with colour. And we have most of us in the room who do neither of those things. Who are, as it were, the more or less unskilled encounterers of [art].

### **HOWARD HODGKIN**

I disagree completely. When I was young and a teacher, I remember trying to explain what I am repeating myself, that everybody has a sense of colour. The very phrase I find unnecessary, most of the time. Everyone has a sense of colour. I used to say that if you sat on bus and looked at everybody else there, sat on the tube looked at people sitting opposite you and looked at what they were wearing. I was often amazed how even the most ill favoured people knew very well what they looked like and that the peculiar lack of colour in their hair or their too much colour in their skin was answered by a piece of clothing they were wearing.

So it is all context. It often breaks down in human life generally, when people stop doing it, they think it s unnecessary.

### **LISA JARDINE**

Can we take that thought on further. When colour is laid on in context, one of the things Richard has mentioned is that, another colour alongside it will alter the context. So the process

### **RICHARD GREGORY**

Or what the object is, or is seen as. The context is more general than that. It s not just colour context. It s the context of the whole picture.

### **HOWARD HODGKIN**

It will also alter the nature of the colour. There must be, and you will know about it and I don t, learned treatises on what happens to colours when they are adjacent to each other.

### **RICHARD GREGORY**

Yes, there are a lot of studies on that, certainly.

### **HOWARD HODGKIN**

But the only ones I ever came across as a student, I had a teacher who was very keen on Chevreuil s colour theory of the simultaneous law of you probably remember the title, I don t, which Seurat was supposed to be very affected by which meant that a green dot then the copy of the book that we had to look at, which was in fact pre-Seurat date mid-19th century, around the green dot you could of course see a little haze of pink. It was only after a bit that you realised that the carefully hand-coloured haze of pink to make the theory true, had been added. But there is something in it.

Obviously in physical terms you say those don't exist but I think that for painters of all different kinds in all different periods we have had to believe that colour really does exist. When we look at someone with blue eyes their eyes really are blue and that blue relates to the period of the virgin's robes. It relates to the colour of the sky and all sorts of associations are triggered. I think that comes from a much more — where I was disagreeing with you maybe I didn't understand you entirely — general experience of life than reading Ernst Gombrich's history of art. I think it is to do with how people perceive the world. To me a work of art of any sort, whether it's a printed paper coffee cup or a painting, they are all a part of this same perception of the world. Well are they?

### **RICHARD GREGORY**

I don't think you should be worried that the colour itself isn't in the external world. The thing is that what is in the external world, wavelength of light, generate or evoke colour in our brain. Our eyes and brain are not all the same. I was speaking to somebody today who has quite marked colour blindness and for him all colour looks different because his eyes are different. It's one of the points that John Locke picked up, that it can't simply be out there in the world because it's different for each of us. Now, when you take context into account, if you put one colour next to another, that is quite lawful. In fact, carpet designers use this. They get away with quite a few different colour threads or wools, and get much more colours in the carpet than are actually there. You can generate colours and save money, in carpet making. When you relate it to context, Faraday actually had this blue on his desk. Did the context of his room make you see the objects and the colours in this room differently? That is jolly difficult to study scientifically. I think as the artist, you've got the handle on it. You can kind of play with those very complex context interactions much better than we can. Our experiments are too crude to investigate them adequately.

### **LISA JARDINE**

Can I then ask you a question to see what perhaps Howard makes of the answer. What about pleasure? I know you said that about colours of food but if we move away from the very causal, the very direct, what about perception and feeling, other than the raw feelings of I can eat that, or I'm frightened. When Howard talks about precision, when he writes about how, when he has laid on ever so many layers of colour, there comes a point when the memory has made the thing real again, or am I misquoting you? That is a different register of feeling. Does your perceptual version of colour account for that register of feeling?

### **RICHARD GREGORY**

I think that science is very weak on this. There is quite a lot done on emotion, started really by Darwin, whose brilliant analysis of facial expressions and emotions in man and animals actually set the whole scene for modern studies of emotion. His argument really was a very interesting one. It went like this. An animal responds to a situation in order to cope. In other words, when it sees its

mate, it does the right thing. It sees food and does the right thing. Or it sees food that has gone off and throws it away. Colour is one of the signals for this. If a girl, let's say, has a nice healthy looking cheeks, or nice hair, she is probably a better bet for the next generation. That's all part of the coding which is there.

**LISA JARDINE**

You don't really believe that?

**RICHARD GREGORY**

Darwin went beyond that. He said you get a bodily reaction to this. You get visceral changes taking place. You blush and so on. The emotion is actually the sensation of the bodily reaction to the situation. So I look at the charming girl, blush, and go like this. My emotion is really sensing my bodily reaction. Bodily reactions can't be fooled by emotion?? This is the James-Langer theory developed from Darwin, in a way, by William James and Langer. Modern theories of emotion, on the whole, are rather like this. They are related to the physiology, the changes you get in a given situation and then whether the emotion is the sensing of the bodily change, which goes back again to evolution and whether it's useful or not.

Now, whether the painter is evoking all that biological stuff, I haven't the faintest idea. I really don't know.

**HOWARD HODGKIN**

Nor do I.

**RICHARD GREGORY**

This is a terribly interesting point. When you are looking at a picture you know it's a picture. It's not an actual girl you could take out to tea or more. It's a piece of canvas with colours on it. Yet you know it's supposed to be a girl. Does that evoke the basic reactions that Darwin talks about? I don't know.

**HOWARD HODGKIN**

No, I shouldn't think so at all.

**RICHARD GREGORY**

So what's going on?

**HOWARD HODGKIN**

Trompe l'Oeil, which is what you are talking about. Deceiving. I've forgotten the name of the famous early Greek painter who painted the bunch of cherries. Deceiving the eye very rarely works. Without going into lots of side issues like the invention of photography, and colour photography, film, television, paintings do look like paintings rather than young girls.

**RICHARD GREGORY**

I wasn't referring to Trompe l'Oeil particularly, it could be a cartoon, on this argument. Indeed you could look at a cartoon and laugh your head off. It can evoke emotional reactions. Why can it do that? You know it's a bunch of lines. You know it's not really there as an object.

**HOWARD HODGKIN**

I can't answer that at all. To me it is an object.

**LISA JARDINE**

Okay, could you say a bit more about that.

**HOWARD HODGKIN**

Like what? I have to believe when I'm working, and of course I do. Until this moment I never thought that all I did didn't exist. I have to believe that when I am working on a painting, when I say believe I don't mean it's an intellectual thing, I don't mean that it's a thought. It's far more instinctive than that. I have to believe that certain colours when I put them down have a certain effect on the spectator. But it is not in any way codified and I'm not sure that's ever been known to work very well. Going back to Seurat, for example, he had all sorts of ideas at one time about the effects of colour which were not entirely physical, as it were, they were also emotional. He also had bizarre theories about certain shapes going up like that (hand gesture) made you feel happy. If they were going down they made you feel sad. But it didn't really work. So I'm not sure I entirely agree with you when you say it doesn't matter what it is. It's just a bundle of lines. As an artist I cannot work on that assumption.

**RICHARD GREGORY**

I was really asking purely the question, why is something you recognise as a bunch of lines. Here you've got lines that have no function at all. Yet they evoke emotional responses. In a sense this a possible flaw in my argument.

**HOWARD HODGKIN**

I'm afraid it's a question I can't answer because if I could I couldn't do what I do.

**LISA JARDINE**

That's very interesting. In a way the scientist will always be retrospectively accounting for the visual impact which we are trying to account for. Whereas the artist, in a way, must never think about that, else he would stop.

Most artists take a very significant period of time to produce the visual effect, that is it doesn't happen in one morning. You go back to it. Not you alone, artists go back and I know in your own case, and I'm trying not to directly allude to your paintings, in your own case you come back and back and you build up layers until the point at which you are in some sense satisfied. Does that have anything to do with worrying what the viewer will see when they look at the painting?

**HOWARD HODGKIN**

You don't know what the viewer will see, not really. Much as I like when I'm working to feel that when I've finished a picture it's out there and it is for you and not for me. You don't really know that. You can't. There's no way you can. I would like to go back a little further. I can't answer your question but there have been artists who have tried very hard to. I mentioned Seurat, but perhaps the most notorious example is Piero della Francesca who was one of the greatest painters in the world until he started theorising about it. His inspiration, or what ever you would call it, vanished. Even his ability to draw, which was miraculous, vanished.. He wrote pages and pages and pages of theory about what happened when you drew an image of a human being and how to do it and how to do it as economically and rationally as possible.

**RICHARD GREGORY**

So in a way science can endanger art.

**HOWARD HODGKIN**

I don't believe that for a minute.

**RICHARD GREGORY**

But it follows. If an explanation is important in how you live with what you are doing, and then some old scientist comes along and says "Look there's no such thing as colour, you might as well throw yourself out of the window"?

**HOWARD HODGKIN**

I don't agree at all. I think it would be very interesting if science could answer the question which you just asked me.

**RICHARD GREGORY**

I feel quite worried that I destroyed a great work. On Face to Face with Friedman, he was interviewing Henry Moore. Henry Moore apparently started to read Jung, and then thought that all his art was disappearing out of his mind. So he stopped reading Jung, apparently. He was frightened of Jung because it destroyed his artistic impulse. Maybe that is possible. I'm thinking about art to science. Is there a danger?

**HOWARD HODGKIN**

No, I don't think there's any danger. It sounds as if art might be a danger to science.

**RICHARD GREGORY**

I hope so.

**HOWARD HODGKIN**

On the contrary. I think that science could be a great help but it is not as one to one, as some of these questions would suggest.

**RICHARD GREGORY**

I would like to put the following analogy, if I may. If one is a violinist, which I am not, should a violinist know about the physics of a violin? Should a musician know about the way the instrument works? Similarly should a painter or musician know about the mind? About the brain, because you are playing upon our brains and minds as on a violin. I would have thought it's rational for the artist, art schools indeed, to know much more about perception. I really would.

**HOWARD HODGKIN**

Yes, I think that's quite true. It would help if it was taught in some way that was relevant to what they are doing but as they don't know what they're doing anyway ..

Audience member interjects: We're not taught about colour.

**LISA JARDINE**

I have a suspicion that there are art students up there.

**HOWARD HODGKIN**

Who was it who said you weren't taught about colour?

Audience member reiterates:

She had very little training in colour theory, one or two days in her course. It's not adequate. She had no training in perception. Very limited in a three-year course. Is that a bad thing?

**HOWARD HODGKIN**

It might be fatal. How do I know. I do think that, going back to what you said, that training in colour is not so far possible. All sorts of things can be pointed out to you but, as I was very unsuccessfully trying to point out earlier, we all have a sense of colour, we all see it, we all experience it. When I was a student and also when I was a teacher, I think that what seemed to be most important was to somehow open, I hesitate to use the word mind, and make people feel that their senses could react to what they saw.

If you approach it from a more verbal position, and this is why I am finding it so difficult to talk about, I think it is very much more difficult. That is why I was talking about the brilliant teacher of teachers of small children because it isn't a verbal thing, with total respect, the perception of colour. It's something physical.

**LISA JARDINE**

Could I ask you to take us a bit further with it. When you put up the parallel lines with the black block, to the audience looking full on it looked like wobbly lines. Actually as we looked up here it was perfectly clearly parallel lines because we

were seeing it from an odd angle. Everybody in the room sees that the same. What Howard is saying is that you cannot anticipate how people see colour.

I'm not wanting to make sharp distinctions. The beautiful stuff I learnt from your books about what we will all see when a particular form is rotated and our eye adjusts to it. Now that has always seemed to me bewilderingly clear-cut. Even though it is an optical illusion we absolutely all see it the same and, in spite of what Howard says, all art students know how to play those games. You're very optically aware. But I am hearing that there is something much more and much less. From Howard's side colour is very precise for him, from the perception side colour is not precise. It is less easy to speak about how people will see colours.

### **RICHARD GREGORY**

Yes, I would say that. Colour vision is extremely difficult to investigate because of these contexts effects. I think this is so.

### **HOWARD HODGKIN**

Which makes it so subjective, apparently. But do you really think it is?

### **RICHARD GREGORY**

Yes. First it is generated within one's self, but what actually produces the sensation of colour is very very complicated. For example, if you have a fuzzy coloured patch and then you make a pencil mark around it the contrast increases. The colour is much more vivid but all you have done is add a pencil line around it. If you then put it in the context of an outside scene, or a room where the lighting is different, or is imagined to be different, that will change the colour. In fact the visual system will compensate for colour of light: what we call the ambient light. That even happens in a picture when one imagines what the colour is like. It could be shining on the object. This is immensely complicated, and in a way subjective, but we have all got these complex mechanisms which we can investigate.

## **AUDIENCE QUESTIONS**

### **LISA JARDINE**

I think we should let people ask you questions. Please wait until a microphone reaches you.

#### **Question 1**

The question of the emotional response to colour is an interesting one as it seems to bridge art and science. The artist is attempting to evoke an emotion often. We also have emotional responses to colours that may not even occur in nature. So what can be said about the emotional response so colours, even out of context to just look at a blue sky which is encompassing all the vision just to

see that one colour, evokes an emotional response. Is that purely a learnt thing or what mechanism might be operating there?

### **RICHARD GREGORY**

It is a complex subject because of these interactive effects, but I think there is no doubt that biologically we are coded to respect certain colours, because they were good to eat, they were environments in which plants grew and animals thrived. A garden is a beautiful place partly because it the sort of environment we survived in very well in the beginnings of mankind or earlier, pre-human I think. That s the sort of broad brush, if I can use the word brush in your presence, that I am embarrassed to do. It starts off, I think, with what is likely to be biologically useful and much the same with all people. If they look well, or ill, there is an immediate response or empathy, which is often triggered by the pallor of their cheeks or whether the cheeks are red. Colour is a signal here for biological fitness. I would say that is probably the origin of the whole thing. On top of that you ve got symbolism. From individual experience. Having experienced pictures in the past. The thing then develops and enriches itself. To talk about what the origins of it are, is one thing. To talk about how it gets enriched by society, by experience, by symbolism, is then a development from that which gives it its richness.

### **LISA JARDINE**

Then you are cheating Howard. If you take a painting of yours like Diner at Palazzo Albrizzi, there is blue in the middle of that which is certainly evoking sky and light, is it not?

### **HOWARD HODGKIN**

I ve no idea.

### Question 2

It seems to me that one of the crucial things at the heart of this debate is a confusion between art and life and perceptions of reality. How one functions as an artist. I am a painter and I do a crash course in colour teaching amongst which is the notion of memory. One of the things which is quite interesting is the instigation of colour. Not necessarily the response to colour. For example, Professor Gregory has asked us to look at a colour to see if the memory survives from a perception.

What is interesting is to get students to close their eyes and to try to evoke a colour without an initial instigation. For example, if you were to close your eyes now and I said to you try and get orange in your head. People who have suffered brain injury very often, I may be wrong here, but the part of the brain were colour is evoked is also the part of the brain where memory is stored. So there is a connection between memory and colour. My experience of working with students with colour is that I would never dream of giving them any sort of codification of colour practice. The fact of the matter is that, particularly for students just starting

on a foundation course, they are almost totally unaware of the notion of the function of value for example, in colour. I have a student who has no colour vision at all. Her whole world is black and white and shades of grey but she is very, very sophisticated in the use of tonality of colour, like this famous case in America where he had to make paintings from what colour was said on the label.

### **LISA JARDINE**

Questions not statements please. But, as I said right at the beginning, I will use this to come back to memory. I think that is our trigger. The relationship between colour and memory for you.

### **HOWARD HODGKIN**

To questioner. Well think of closing eyes and thinking of orange. You just think of a piece of fruit. It s all very simple really. That s not what you meant. Do tell us what you meant?

### **Question 3**

What you seem to be talking about seems to me to be hue, the wavelength of the light. You haven t talked very much about intensity of the light. That I would have thought is very important to a painter and of course everybody else. Is that perhaps part of what you see as the memory effect. Is the intensity of the light, the intensity of the colour important?

### **RICHARD GREGORY**

Oh yes. There is a famous experiment where on a screen they projected a picture of a banana and they made it fainter and fainter and fainter until it was unclear whether one was seeing it or imagining it. This bears on your question really. You never seem to get that vividness for very faint things. But of course, like music the modulation, surely the modulation of the brightness of the colour, is extremely important, is it not? It is in normal life. We weren t really talking in detail technically, were we, about the nature of colour or its complexities, deliberately or indeed about the way the brain handles it and so on. We are trying to get at more general points. Take it as read that it s not just the wavelength of a colour or wavelengths making a compound or complicated colour but also the brightness and the texture. In painting is not the texture extremely important which may be one reason why you didn t like me putting your pictures up on the screen?

### **HOWARD HODGKIN**

No, I just thought that they were completely irrelevant.

### **RICHARD GREGORY**

How can your work be irrelevant to you?

### **HOWARD HODGKIN**

It s irrelevant to what we re talking about.

**RICHARD GREGORY**

Really? Oh OK.

**HOWARD HODGKIN**

The texture of colour is very important because the texture can often affect how much light is reflected by the piece of colour in the picture. So that a very matt texture might reflect less light than one for example you mentioned lapis lazuli a while ago. This thing about lapis and one of the amazing reasons why it was so brilliant a colour blue is that real lapis is very hard to grind finely enough to make a smooth surface of the kind we're all used to. So what you have that you can see easily with the naked eye in a 15th century manuscript illumination is thousands of tiny little bits of lapis, each one of which reflects the light and that of course makes an immense difference and that's what happens in all sorts of paintings using different kinds of pigment for different purposes. But I think that this is getting much too technical.

**RICHARD GREGORY**

Can I just interject a little bit? It seems to me that when you're looking at a painting or particularly at an object, it is not just the surface colours you're really experiencing — it is the object. You're experiencing glass, and that you can put things in it, or wood. Actually the painter is not simply giving patches of colour. He is evoking the knowledge of objects, as you see solid objects, although in another bit of your brain you know it's a bunch of patterns. It's a duality of patterns to the object that seems to me to be so exciting and interesting about art. It's got this double reality, with a sort of tension between these two going on.

**HOWARD HODGKIN**

It can.

**RICHARD GREGORY**

It can. I'm not sure it always does. You're not such a representational painter in that sense. A representational painter is very much playing with that, surely. You represent motion rather than objects realistically I meant.

**HOWARD HODGKIN**

Yup.

**RICHARD GREGORY**

Yes, generally speaking. But you've got this marvellous freedom to do as you want here. You could bring out that sort of conflict or tension between the surface and colours and textures, and then what the object is, by making it more or less abstract.

**HOWARD HODGKIN**

The object is actually the painting and what is fascinating going on from what you're saying and trying not to be too technical but if you look at for example there is at this moment an extraordinary exhibition of Vermeer's paintings. Well, if you look at lesser 17th century Dutch painters' work, particularly very Trompe l'Oeil-ish if I can say something so imprecisely. If you look at them in tiny little details, they are little tiny totally abstract pictures because, and this is an absolute don't of representational painting, that it never works unless you tell the spectator first it's a fraud. Hence, all those paintings of Trompe l'Oeil, all sorts of gamebirds and there was a fascinating exhibition of game birds hanging up on a piece of wood. There was a fascinating exhibition at the National Gallery of probably the greatest of all Trompe l'Oeil artists who was urbane whose name I've forgotten. You always have to tell the spectator that here is a flat surface, here is a picture plane. Then you can start telling lies.

### **LISA JARDINE**

Wonderful idea. Lady in the front here.

#### Question 4

It seems to me that you look as if you're opposed to each other but I can see a very strong link between what you're saying and I don't think that the showing of your paintings was irrelevant at all. To me it was extremely relevant. I can't believe that when an artist is painting a picture that they start thinking about the history of art. He may be interested in the history of art as it shows how paintings have been painted in the past. But I can't believe that when you've got your bare canvas in front of you that you'll suddenly think right now back to previous times. I feel that you must be painting something that evokes some sort of deep emotion in you and I feel that that's what your paintings indicated. In fact there was an awful lot of red in them and I thought he must be passionately aroused every time he picks up the paintbrush. So I do think that there is a link because I think that you're looking at the psychology of it and that's where I think the link is. That in the painter there is something in his/her psychology that causes them to paint in a particular way. It may be an astrological link — I don't know but I think that's where the link is.

### **HOWARD HODGKIN**

Can I answer what I think is an actual question in what you're saying and that is of course you don't think, or I don't think about the whole history of art but what I was trying to explain and which I am absolutely sure is the fact is that all the pictures that have been painted affect how we see a picture or an object and it doesn't matter if you're Van Gogh or Vermeer or Jackson Pollock. What happens in and on the object that you're making is affected for you and for all the spectators by what you already know and it doesn't mean anything as grandiose, I was only using that as a control pap, as the history of art might suggest but there is a pictorial language which we all respond to and that's why we're not opposed, as far as I'm concerned.

## **LISA JARDINE**

Now I have a problem which is that we're going to stop promptly at nine as Susan Greenfield is looking at me very fiercely and I've known her long enough to know that she's very fierce in these circumstances. A question from the gentlemen with a beard very patient up there in the balcony. I'm afraid I'm going to ignore the man down here because I do believe that we should take one token question from the gallery. I've forgotten to look up and there are about a dozen up there. You couldn't confer amongst yourselves could you and nominate a spokesman? There's a gentleman here who has had his hand up for a long time I've suddenly realised. So we're going to take the one up there and then that gentleman in the front up there and then the lady in the very front and that will be it. Please can you keep your question short.

### Question 5

This is a very short question. You mentioned occasion and context earlier. Does this not include references to different cultures — how different cultures respond to different colours. To either speaker.

## **RICHARD GREGORY**

I have to bring up my question mark, because the experiments on this are not really very good, in my humble opinion.

### Question 6

Were you joking when you said that colour doesn't exist, because surely humans exist and most humans perceive colour. The subject of scientific experiment what is true surely is that you can say that it is not an inherent property of a particular section of the electromagnetic spectrum but it exists because human brains are real brains and they perceive it and operate and dissect it in a sense so surely it's not true to say that it doesn't exist.

## **RICHARD GREGORY**

It depends on what you mean by exist. Well it really does. The argument goes like this. If there were no eyes and no brains, there would be no colour in the world; but on the other hand we do believe that things will be heavy, solid, round or square. Colour is special in this way because it depends on brains and eyes to exist. Now it exists in us because we exist. If we didn't exist it wouldn't exist, and that's the difference between what Locke called primary and secondary characteristics. It's a secondary characteristic, not a primary quality as you get in physics but of course it's evoked by physical wavelengths of light — but they are not coloured.

## **LISA JARDINE**

There is a corollary to that which I can't resist putting to Howard that means that no painting exists in that trend. They are, as you explained, illusions created, however realistic, they are illusions created by the application of colour to a flat

surface and therefore doesn't that follow. He says that paint exists, the frame exists, the piece of wood exists, the canvas exists.

**HOWARD HODGKIN**

Yes

**LISA JARDINE**

All paintings are illusions.

**HOWARD HODGKIN**

No. All paintings are not illusions.

**LISA JARDINE**

In his sense of existence.

**HOWARD HODGKIN**

I didn't think you were saying that.

**RICHARD GREGORY**

I'd say the significance of the painting depends on brains and eyes and intelligence. The significance of the painting would not be there without us.

**HOWARD HODGKIN**

Yes, Yes.

**LISA JARDINE**

So the painting wouldn't be there without us?

**RICHARD GREGORY**

It depends what you mean by painting. As a physical object with primary qualities like hardness, weight, but not its significance.

**LISA JARDINE**

Final question

Question 7

When you've got a picture and everything is more or less as expected but there is a bit of colour in it which is totally unexpected. What happens in your eye or in your brain which gives you a sort of zitheryness?

**LISA JARDINE**

Great question.

**HOWARD HODGKIN**

I think that's a very good question. Before Richard answers it, which he certainly should, I should like to know why so many 17th, 18th and 19th century landscape painters loved to add a little touch of red.

**RICHARD GREGORY**

I will make one very general comment, if I may, as I am not expert in the way you are, to answer that specific question. What does matter in perception is surprise — that we tool along without noticing what we are doing until something surprising happens. When you are driving along, and a pedestrian starts to move into the road, you are immediately aware of it and highly conscious of it. I think this little dab of colour may be evoking surprise, which you then switch your attention onto it, and process it more fully. Surprise is equal to information. The more surprising something is technically, the more information it conveys. It also attracts our attention. I think this is the kind of answer I would give.

**HOWARD HODGKIN**

I think that's brilliant.

**LISA JARDINE**

I think there has been a lot of very interesting movement in the conversation. To have Howard say that he thinks that what Richard says is brilliant. Richard Gregory, Howard Hodgkin thank you both very much indeed.