Why Music? Is Music Different from the Other Arts?

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TRANSCRIPTS

Can there be a Science of Musical Understanding?

Professor Roger Scruton

Michael Trimble: And with that I'd like to introduce Professor Roger Scruton. I'm sure his name is well known to all of you. He has a number of titles, including Visiting Scholar of the American Enterprise Institute, Washington, senior research fellow of Blackfriars Hall, Oxford, and many other visiting attachments. I personally know him through his writings, particularly in relationship to music, but his work is so central to this whole area of links between art and the brain. Professor Scruton if I could ask you to take the podium please.

Roger Scruton: I suppose I class as a neurosceptic, and someone who is not yet persuaded that neuroscience is relevant to anything very much except itself. But nevertheless, I'm going to try and introduce this topic in a relatively open-minded way. All those titles and affiliations that you find in the programme are entirely fictitious. They are my way of giving myself some standing in a world of which I largely disapprove. So there is my real affiliation. We do everything from log-cutting to logic-chopping and live as best we can, but for the last 20 years, most of which have been freelance for me, I have been thinking a lot about music. It is obviously the case (Michael Trimble has made an excellent survey) that advances in the neurosciences have begun to impinge upon what for me was a sacred and protected territory and one has to, as it were, herd the call to rush to the boundary to defend it. But whether that is possible I don't know.

It all starts with these two words: cognitive and neuroscience. Brought together to suggest that there really is a new way of looking at the human condition, in which we combine cognitive science and neurology, and by looking at the brain discover the real hidden truth about the human condition. The brain is where we are, and if we can discover how it works, we discover how human life is conducted, and perhaps how it should be conducted. It's obvious there are scientific questions about music and Michael Trimble has already introduced us to some of them. Many of them are broadly statistical questions about how people respond to music, whether there is a universal interest in music, or whether it's confined to certain cultures. Whether tone deafness is widespread or confined to small areas and so on. And those are extremely interesting questions, and of course knowledge of them is advancing all the time.

I give you here Ian Cross's definition of music. You'll see just how strange the cognitive science approach will sound to the ordinary person:

> 'Musics are cultural particularisations of the human capacity to form multiply intentional representations through integrating information across different functional domains of temporally extended or

sequenced human experience and behaviour, generally expressed in sound.'

At least he's got it right at the end. But the question is what does it all mean at the beginning? When people write in this way, it is a sign not of real science, but of the hope for science that has yet to arrive. There may very well be a science that will arrive, and of course what we are dealing with are two very important advances in our understanding of the human condition. The first, the adaptation theory of the human mind which tells us that we can understand our human capacities as adaptations which have been selected for in the course of evolution. That is to say, things that came into being for whatever cause, which enabled our ancestors to deal with the problems that confronted them and as a result were selected for in the process of competition for scarce resources. That theory of the human mind which comes straight out of Darwin, and has been amplified by the discoveries of genetics and by people like Richard Dawkins, or rather, popularised by Richard Dawkins - whether or not he has added to it - that approach has evaded the culture. People cannot help but think of each other in this way, even if they cannot retain the thought for long enough to do real damage.

The other great advance is the computational theory of the human brain, which is more a philosophical than a scientific discovery I suspect, growing out of Turing's work on the sequencing of inputs to logic machines. The computational theory of the human brain tells us that the brain works like a computer. It works by taking certain inputs and computing them to produce certain outputs. To understand the human brain is to understand the links between input and output, how the brain processes the input in order to produce the appropriate output, and although that is a very speculative thing, it does seem pretty plausible to suggest that the brain works like that. The question is could we ever get the hardware, the actual synaptic connections, to show us just where the currents of electricity go, and just how the synapses, the logic gates in the brain, could carry out these computations? That is something which may or may not emerge in the course of neuroscience, but it certainly hasn't emerged yet.

Now this leaves us with certain problems about music, and Michael Trimble has already referred to Stephen Pinker's claim that it is an auditory or evolutionary cheesecake. That is to say that from the point of view of evolution, it is simply a byproduct of certain sources of pleasure creation which themselves might be functional but in generating this particular interest are not functional at all. That idea is largely rejected by those who have looked into this, but it's not clear if music is an adaptation. It's not clear whether it enjoys dedicated neural networks. It seems as if there's all kinds of neural processes involved in understanding and listening to music, and there's a big question as to how it relates to language. So, that's just scene setting.

I'll just say something about music and language. This is a very difficult area. Our understanding of language has been changed by Chomsky who was applying thoughts and theories which arise within philosophical logic. He argued that there are linguistic universals, that is to say there are ways of combining words and understanding words which are revealed to be the common property of mankind, and that these ways of combing words and understanding words depends upon a generative grammar. A grammar which generates surface sentences from a deep structure in which a finite number of operations can be discerned. Those operations are common to all human languages, and this has various obvious consequences. It suggests that language is an adaptation, because it's something which is in common to the whole species. It also has a structure which all human infants are already embedded in, and it suggest that language is processed in a particular way, and

perhaps we can get somewhere towards understanding language by exploring that process.

Now, this has led to the search for a generative grammar of music and two people in particular are known for their contribution to this. Fred Lerdahl, who is a composer and also a cognitive scientist, and Ray Jackendoff who is a linguistician; both in MIT, or they were at the time. They produced a book called *A Generative Theory of Tonal Music* which tried to show how it is that our understanding of surface structures in music can be linked to a generative grammar which produces those structures, from deep structures which are both simplified and universal in form. They've gone a long way in that book towards hoodwinking the musicological establishment into thinking that they had done a bit of science. In my view, it is all entirely phony and I try to show this in my book *The Aesthetics of Music.* It may be that there is something there, but the main problem is that, although there are rules of musical syntax, we distinguish grammatical from ungrammatical sequences in music. We distinguish complete phrases from incomplete phrases. If I play you something like this: [*plays musical example at the piano*] you'd think gosh, that's incomplete, I need something to bring that to a rest. Now, that's a little bit like an incomplete sentence in a language. There are lots of analogies with language in that way, but such rules that we can develop, rules of musical syntax, are not really generative in the way that the rules of syntax in language are. We group things together in our musical experience, but this is a very surface phenomenon. It depends upon things such as prolonging a particular chord, anticipating its successor and so on.

The idea of deep structure in music is as controversial today as it was when it was first proposed by a gentleman called Schenker whose writings on the theory of music I'm sure all musicologists in this audience will have known, if only in order to avoid them. This sense of musical syntax is shaped by our preferences - what we like about things. Some people might like a sequence which [*plays musical example at the piano*] goes up a C minor chord then stops on F sharp and that's it. We don't like it, some people might. But it's to do with our preferences, not to do with any incompleteness in the utterance itself. And again, I think one can say that there is no such thing as a musical semantics, no representation that's internal to music. Of course, a phrase in music like that has a meaning for us, we can say it's meaningful in the way that the human smile is meaningful, or a gesture is meaningful. But it doesn't have a meaning in the way that this sentence I am uttering now has a meaning. There is no way of deciphering it and saying it's about something, other than itself.

And that word *about*, which is the most mysterious word in the language, is one that distinguishes human beings from the rest of nature. We have thoughts *about* things, *aboutness* is what circumscribes us on every side. And yet music seems as though it's about things but as soon as we try to find out what it was about, we find that we can say nothing except that it's about itself. This does suggest an obstacle to the view that the theory of adaptation and neural networks can give a full account of music, because that strange pleasure that we feel in music does involve a certain understanding and therefore it seems more like the other cognitive aspects of the human condition, like language, but you can't complete the thought as to what it is that it says.

We can easily give an adaptation theory about liking for sugar, and there are plenty of such theories. We like sugar because it's an easily obtained, high energy product and our ancestors who developed this taste found themselves with an evolutionary advantage over those who hadn't when it came to picking fruit and so on. But to produce an adaptation theory for our liking of musical phrases on those grounds would be impossible. I think this raises an important question for

evolutionary theory generally, and this is the question of the relation between understanding something and explaining it. If we explain something as an adaptation, we don't thereby show how it arose, but only why it remained. That's fairly obvious isn't it. It remains because it conferred an advantage, but how it arose, who knows? Nor do we say how the thing is understood by those who possess it. We don't have to understand anything about sugar in order to like it, but we do have to understand something about language in order to use it. We do have to understand music in a certain way in order to enjoy it, but explaining it as an adaptation doesn't necessarily give us any insight into what we understand when we understand it.

Think of mathematics. Mathematics is very obviously an adaptation. If you can't add, you won't multiply, to put it simply. You've got to get out of those elementary arithmetical situations in which all animals at a time in their life get trapped, and many animals can't. Rooks and other corvids are brilliants at this. They know that 12 men with their guns went under that cover and only 11 came out, so it's still dangerous. There's a little bit of mathematics which has helped those wretched creatures survive. It's obviously adaptive to have this capacity, but that doesn't explain why it is that people sit down working out the properties and the topology of n-dimensional space or the theory of transfinite cardinals and so on. Far from being an advantage, it's a huge disadvantage. If humanity spent its time doing that it would be the end of us. But it follows from the elementary arithmetic that we have to understand, that all these things are true. An infinite number of incredible truths about the universe pour out of the simple grammar of set theory. What are these truths about? That's a huge philosophical question which has never been solved. So, our understanding of mathematics, in order words, has nothing to do with its adaptive capacity and explaining it as an adaptation doesn't contribute anything to understanding it as a human practice. And the same thing with language. Obviously, once a transformational grammar is in place it confers a huge reproductive advantage on our species. But how could such a thing arise in the first place? We don't know. And how is it understood? That's another question which we still need to provide an answer to. And these are not obviously empirical questions, they're not questions that you can settle by fieldwork, by investigation of how people actually behave. You've got to produce something more like a logical theory which will give you an account of these things as abstract structures.

Now, this takes me to the case of art, and pictures of the brain. An image, as we know, can be represented in two-dimensional space in terms of pixels. What colour is at this particular place on the graph? At 5X, 7Y. That little point, what is there? A little patch of Prussian blue. I could give a description of the Mona Lisa in those terms. In fact, I've got a picture on the next slide for you to look at. [Titian's *Venus of Urbino*.] I could tell you, if I was clever, what every pixel on that picture is in terms of its colour concentration, and from that description you could reconstruct the picture. I could feed it into a machine, that information, and it could reconstruct the picture. Indeed it's doing so at this very minute. But there's no evidence that the machine has seen what you see in that picture; has been shocked by it as Mark Twain was, or delighted by it, as presumably Titian himself was. What you see in that picture is something quite beyond the pixels that compose it. So what is the relation between the image and the pixel? This is what could be called a supervenience relation. If all the pixels are in place then so is the image, and in that sense, the image is nothing more than the pixels. But, the image is, of course, something over and above the pixels for us. When you discover supervenience relations, you are tempted to say things like: "well that just shows that Titian's masterpiece is nothing but a display of coloured patches on a graph. Anybody could do it. It's nothing but that."

This is what Mary Midgley calls nothing buttery. The standard move among reductionists and haters of the human condition. To discover that one thing depends completely on another, and therefore to conclude that it is nothing but the other. The digital camera sees the object and records it in a digital code, which it then decodes onto a screen, and that's what has just happened with the Titian. And people say likewise, the brain decodes the image on the retina and transmits it through computational algorithms to the visual centre of the cortex, and there produces…what? There's the great question. Is there something else inside there? A little homunculus who's then decoding it? Well then you have an infinite regress if you take that move. It doesn't produce anything except more computations ending up where? With somebody crying in front of the Venus of Urbino. But somehow this description of what goes on in the brain is leaving out something, as I've left it out in describing the computer. The computer produces this image but it doesn't produce that image for itself. It does produce it for me and for you; we are the masters of this thing. We are engaged in that ultimate act of interpretation which endows this with a meaning. In other words, which makes this into something about something. There's that word *about* again. The aboutness of this is not provided by the computer; the computer has no aboutness about it. It is us alone who sees this, not only as a woman, but as a representation of a way of life, as a vanished way of life which is very likely to evoke in us all kinds of emotions; regret and desire.

And so, one way of describing this here, is to say that the pictorial images emerge from the pixels, but they're not identical with them. They're not something over and above coloured patches in one sense, but they're not reducible to them either. And it's a fallacy to think you can understand pictures by reducing them to their pixels. On the contrary. Understanding would be lost in the process, as you'd lose the crucial aspect of it, namely its aboutness. So there's a fallacy involved in reductionism. People could be picture-blind in the sense that they don't ever see images, but they do see all the little bits from which images are composed, and that would be a great disadvantage. Or maybe it would be an advantage in our image-saturated culture, but still, they would have lost something. It would be a little bit like some cases of autism where people seem to exhibit person-blindness. They can see the human being, see him as an organism, see how he works and everything, but somehow they don't see in that entity what it really represents, namely the presence before me of another self-conscious being, another being who can say 'I'. So, person-blindness seems to exist and it's one of the great problems of psychology to understand it.

So part of what we understand of pictures is their aboutness. The picture is telling us something, but it might be, as in the Titian case, about nothing in particular, and nothing in general. Okay, it's telling us about a particular woman, but we're not to suppose that that woman exists. It's a very particular kind of nothing that it's talking about. If you're happy with that example, it's just to illustrate a general point between the things we understand and the things in which we find them.

This enables us to say something about the relation between music and sound. Music stands to sound, roughly as pictures do to pixels. There are sequences in music which are sequences of sounds, but if you just heard them as sequences of sounds there could be something that you've missed. If I play [*plays the first five notes of an F major scale*] – that's a sequence of notes which you may just hear as pitched sounds, but most people in this room will not hear it as just pitched sounds, they will hear something starting in a certain point and rising to another, moving though musical space. But what is that space? Where is it? Obviously, that sequence goes up, and you might want it to come down again or move on, but there isn't anything that

actually moves though space; all there is is a sequence. That's fairly obvious isn't it? There's no way in which this note F can move to G. F is F and that's its identity. It didn't move. And G didn't move either. They are eternally fixed in their point on the musical scale where they are identified. And yet something started and moved, and it left you probably unsatisfied. Something else has got to happen when you get up to C. [*Plays the first five notes of an F major scale, then a C an octave below.*] Then surely… [*plays an F*]. An urgency suddenly came into that second C, the bottom C. It was unsaturated. And yet nothing about those pitched sounds has that quality.

So, in hearing melodies we hear something more than just sequence. And same with simultaneities and harmonies. I can play you two notes [*plays an interval of an octave*] and you hear two notes together, [*plays an interval of a major seventh*] and there too, but somehow that [*plays major seventh*] isn't as good as that [*plays octave*]. The simultaneity of those two sounds creates a relation between them which is one of either harmony or dissonance, and hearing harmony is more than just hearing those simultaneities. Likewise with rhythm and measure. We can measure out the sounds that we play. You can give a complete graph, which is what we do in a musical score, which tells you exactly when you sound one thing and when you sound another, and you count out one, two, three, four, and where that particular sound goes, and where this particular sound goes, but it doesn't necessarily create a rhythm. [*Plays the opening of Take Five*] – now, could you write that down? Most people couldn't. Take Five by Brubeck. And it's not the writing down, or where the sequence falls on the graph that you hear. What you hear is something completely different; a kind of life-force which comes through those notes, which demands the syncopation that organises them.

So in all this way, musical space emerges which is something more than just the sequence of sounds. It's something like the way that Titian's great Venus is something more than the pixels in which you see her, but she isn't anything more. And in the same way with the music. What we hear in the music is the development of a field of force, of tension and relaxation, of gravity, opacity and so on, and I'll illustrate these with the opening of Beethoven's Third Piano Concerto.

[*Plays opening of Beethoven's Third Piano Concerto*.]

There we are. I'm sorry to turn it off. That's a very grammatical piece of music, but you can hear from the very beginning how Beethoven is constructing out of the simplest materials a kind of pattern of tension and release and making these notes into something more than just pitched sounds. If you just take the opening melody. [*Plays example on piano*] – why does it have to do this? Why did Beethoven add those two little dominant-tonic commas at the end there? It seems right, but how should you hear it? Should you hear those end commas like a repeat, or should that second repeat be the completion of the phrase? You've got many different ways of hearing this. And then it's so simple. You've got the C minor chord, the chord of the key, followed by the scale of the key, and yet it stays in your mind and immediately constructs out of it something quite different, landing on what is known as the dominant minor ninth which is really full of tension. What you hear in that is the creation of a space in which there are already tensions and demands. Each note has got a relation to others, but there is a kind of gravitational force which controls where each note is in the field. And that is something which Beethoven was a particular expert at. All he's done there is taken the two chords of the key, the tonic chord followed by a dominant chord, and presented them in a way which maximises the tensions on the dominant and minimises them on the tonic, and that remains in your

mind throughout the movement thereafter. That's essential to understanding the piece. You don't necessarily have to put it into words like I'm trying to do now, and you could go on for the whole lecture talking about just that phrase and still you wouldn't have discovered everything there is to discover in it, but you hear it as something more than just a sequence of notes.

Here's where the neuroscientists might come in and say "yes, but it's other than the sounds". Sure, yes, I agree with that, but it's nothing BUT the sounds. And there is still the scientific question of how and by what means do we group notes as melodies? Is that not a scientific question? At first it does seem like a scientific question. There ought to be a mechanism which is at work when you take the first of those dominant-tonic commas with the melody, and then leave the second one out as mere repetition, and that mechanism ought to be different from the one where you hear them both as part of the melody. You can imagine an incredibly lucrative research grant which puts people in MRI machines and comes up with a some little result here. Would it have answered the question? Only if we understand what the question is. And that is part of the problem.

Much of the advance in these areas, of which you'll find summarised in the book by Aniruddh Patel, consists in answers without questions. For instance, his definition of a melody, as: 'a tone sequence in which the individual tones are processed in terms of multiple structural relationships.' It's a bit like Ian Cross' definition of music isn't it? It all sounds very impressive and professional but what does he mean by relationship? Why structural? Does he mean the relationships that we hear? Like the relationship between G and A flat, that we hear only because we've got this [*plays a dominant minor ninth chord*] in the middle of it. In which case we have to go right back to the beginning again and talk about our elementary musical understanding of these things. But he might think of the relationships as completely different kinds of relationships, relationships of the actual sound structures themselves. Any anyway what does he mean by structure? Does he mean musical structure, or actual acoustical structure? These are quite different. The acoustical structure of that which I just played is very complex; thousands of overtones thrashing against each other which causes that dissonance, but the musical structure is incredibly simple. It's just going up the thirds of the dominant chord. Simple, but part of a grammar, a syntax which makes sense of it.

So are these scientific questions? And it raises again the difference between explaining something and understanding it. And perhaps we need to do a bit more understanding of music before we set about the task of explaining it. Having read some of the literature on this, there is not enough attention devoted to it. Indeed, because neuroscience is very popular now, and you'll find undergraduate courses in it, textbooks of it, undergraduates sign up to this because it looks like the future. The future is going to be brains. If you're doubtful as to whether you have one, then it's jolly good to sign up now. And when undergraduates sign up to courses they bring with them all their debris, in particular pop music. And this means that the literature of the neuroscience that is produced in textbook form has to address the question of music in such a way as to suggest that pop music and Beethoven are all the same thing, and that's what we're talking about. Maybe we're not talking about it at all. Or maybe there are a lot of different things here. Why should we think there's something in common to the beautiful grammar I've been explaining through Beethoven's Third Piano Concerto and the grammar of the twelve bar blues? Why should you think that they're appealing to something that is fundamentally the same in the human condition? Maybe they are, maybe they're not. But until you've said something about understanding music, you won't be able to answer that. But it's not a question that

you can ask in front of a lecture theatre in front of modern undergraduates because they will get offended.

Anyway, it seems that music has a kind of aboutness. It constantly seems to be pointing beyond itself to the world outside itself. But it isn't about anything in particular. When people sit though a late Beethoven quartet, with an attitude of concentration, they come away thinking yes, something has really happened here. I've been told something, but it's not something I can put into any other words. But nevertheless, it's not just a sequence of sounds which I've heard. I've heard something which had said something to me in the way that poetry can say something to you. It's a kind of aboutness, but it's not a semantic idea, therefore it's a real puzzle as to how we explain it. When Schopenhauer said that quotation that Michael Trimble gave us, that in music we find the hidden essence of the world, he is saying something similar. He is saying that yes, music has an aboutness to it, but what it is about is something which cannot be put into words, precisely because it is the essence of things, and not the appearance. We can put appearances into words, but not essences. For Schopenhauer, the essence of the world was something he called will – the undisciplined force that moves though everything and which is revealed in representations but is in itself indescribable. Only in music are we confronted with it. It's an intriguing idea, but in my view, in the end, not one that you can adhere to.

When we ask ourselves what we mean by the meaning of music, the aboutness of it, we find out straight away that there is an asymmetry between listening and performance. You can ask the question what is it to understand that phrase of Beethoven's. [*Plays the opening melody of Beethoven's Third Piano Concerto.*] Somebody can show his understanding by the way he performs it. You might say that that particular way of playing it shows a complete lack of understanding. We are always saying this about performance, we are judging it in terms of whether it shows an understanding of the piece or not. But listeners don't show their understanding in the same way, or maybe they do by being properly silent. But many people who don't like music have learnt, nevertheless, to stay silent while it's played. That's not what is important in understanding either. In some way, the music is inviting you to enter into its sphere of influence, and when you hear the movement in the Beethoven piece, you are in some way moving with it, you are feeling the naturalness of this movement in yourself, and maybe that understanding the music is rooting in that sentiment, that I can move with this, I can feel where it's going, and I feel a satisfaction when it comes back to the tonic. I can feel that tension in the dominant minor ninth and I'm moving on, I'm being myself moved on by it, and sometimes when it might seem wrong, I can't move with it.

This is a very important feature of music, that there is the wrong note experience. Even in a melody you have never heard before you could recognise a wrong note. That note isn't right, it just doesn't sound right. If I took a simple English folk song [*plays example*], if I then went like this [*plays example again with a flattened sixth*] you would say, there is something wrong there, although that is actually, from a harmonic point of view the right note. That English folk song is in a mode, not in the minor key and it required a B natural not B flat at that moment, and anybody could hear that, even if it was the first you'd heard it, and that is a very strange thing because it seems as though when you are hearing it you are with it in some way. You are moving with it and you know, or you can anticipate how it's going to be, even though you're not a musician or anything else, and you're suddenly brought up short by the fact that it was not the note you expected.

So this is the fundamental experience involved. To talk of musical syntax is only an analogy. It's the whole person who is involved, not just the brain. Brains

don't dance. People do. And it's through our own understand of who we are as a complete embodied creature who's used to facing other people, making gestures, dancing with them, moving with them and so on, that we can also extend that to our understanding of music. I think this is one of the dangers in concentrating only on the brain, that it may lead us to ignore the fact that we respond to music as persons not as computers. We live throughout interpersonal responses. This is where I just want to leave the argument.

Being alive means being one person among others. Liking, loving, hating, feeling guilty, ashamed, grateful, happy, all these outward-going features of the human condition which essentially involve our nature as embodied beings. Persons are not in any real way reducible to their brains. But these interpersonal responses through which we live, we transfer them to music. That's what creates that space that I've been referring to in describing the Beethoven. That space in which you hear tension and release, movement, arrest and so on. It's a version of the space in which we situate ourselves. And already that music has a pronounced personality from the first bar, and you're engaged by that person and responding to him, in something like the way you respond to someone who comes and tells you a story. So these interpersonal responses become transferred to music and that is where the meaning of music comes from. It comes from us, from within us, from our interpersonal responses, and the music itself works on those interpersonal responses. That's why we can learn things from music. You can learn about the sincerity of the religious attitude from Beethoven's late quartets. He is presenting you with how it feels, inwardly, to have that kind of concentration, and in responding, in some way, you are amplifying, through your own imaginative powers, your own understanding of human possibilities.

We do this also when we fit music to words, and to the world. It's a very interesting thing that people, from the beginning of time, have set words to music and thought that there is a relation whereby music and words can fit to each other. Sometimes words don't fit and sometimes they do, and fitting words to music is something which we have a natural instinct for. We can recognise what is appropriate and what is not appropriate, and likewise we can fit music to the world. We know what music is appropriate in certain circumstances and so on. All this suggests that we are incorporating music into our lives at the highest level, the level in which we exist as persons. I think that maybe there is an adaptation or two at the back of this, but that is not the point. There is a shared practice which has something in common with religion. It provides a frame to human relations and to our own self understanding. Of course, I'm talking of the Western classical tradition. But this is one reason why the Western classical tradition has driven everything else out. It has developed this extraordinary capacity to create a frame in which people can develop as persons and relate to each other. That's why a work of music can change the world. And we have examples of that. Maybe they don't change everybody's world, but in the long run it changes the world. Bach's *Art of Fugue* certainly did this; the operas of Mozart did this and maybe the operas of Wagner too. We have to recognise that the power of music can be understood in this way but what I have done in introducing you to a way of understanding music is to ignore all the scientific questions, and go about the matter as if the understanding of music were a properly humane form of knowledge. I've given you a little exercise in justifying what the Germans call the Geisteswissenschaften - the knowledge of the human spirit, and I think it's very important to approach music in this way because otherwise, not only music, but all the humanities will be confiscated by science, and nothing of them will remain.

Questions from the audience

Question: I'm very grateful to Professor Scruton for giving me the word neurosceptic, as that seems to sum up my position very neatly, although I've always taken a great interest in the neurological. I just wanted to raise one slight quibble, which is that he seemed to base a lot of his argument on our response to pixels but not to paint surface, which seems to me to be more to the point when discussing what Titian meant, if he meant anything. It seems to me, to use a very modern technology as an analogy to mental processes may seem appropriate to neuroscience but is not the obvious way in which to make sense of the human relationship between a human being and a work of art, in a medium like oil painting.

Roger Scruton: Yes, I quite agree that in the end of course there is something quite different between the picture that I showed, created through reducing Titian's masterpiece to pixels and then digitalising the result, and the Titian itself which uses oil paints and therefore has continuities. A pixel-generated picture is essentially generated out of finitely many parts, whereas an oil painting can be decomposed into indefinitely many parts. But, I think that although that's important, it is in itself a quibble. There is a lower point of discrimination of which the human eye is capable of. We can't divide things infinitely, and you could imagine a perfect pixel generator which could decompose things to that point, and then it would actually be presenting exactly what we see when we see an oil painting.

Question: I was interested Professor Scruton that you didn't use the word resonance at any point, but at the end of your presentation comes the question of human relations, and I think if we're beginning to understand anything of what happens in early attachment relationships, it's something about resonance between the emotions, and emotion isn't a word that has come into the discussion until now. I wonder if you could comment on the question of resonance and emotion?

R.S: Yes, that's a very good point. I know that psychologists have done a lot of work on the way in which emotion is communicated from mother to child, through things like rhythmic movements and singsong words, what psychologists call motherese, and this does have something to do with our eventual understanding of music. Resonance is a jolly good word. There are lots of words that you can use, but the phenomenon is what I was describing, and there is a real question of course as to what the relation between those early attachment episodes and the subsequent understanding of music is. There's always a danger in this area of reading too much back into the thing that you want to use as your explanation. You can explain our subsequent understanding of music in terms of attachment theory of the Bowlby type, if you describe the attachment between mother and child as already musical. You're saying that he's moving along to the rhythm, he's singing along with that, but then of course you've written the explanans into the explanandum so that you've essentially not produced an explanation at all.

Question: I too was very interested to hear the word neurosceptic, and I liked that, but the other word that I found missing, unless it's in your word human relations, is the word culture. And the throwaway line at the end – 'that's why it's wiped out all other musics' – a) isn't true and b) raises huge questions about the way in which you set it out here as being a culturally defined philosophy rather than one that we can willy-nilly actually apply to other cultures, and I don't know whether it is contained in

your word human relations but I would appreciate to see whether in that word human relations you also include the word culture.

R.S: Of course I am talking about a cultural phenomenon and in defending the humanities I am defending an approach to human knowledge which is fundamentally founded in culture, but of course I am also having to try to confront an approach which doesn't recognise culture as a significant input to this. The whole nature of the adaptation theory of the human mind is to marginalise culture, to see that as something that comes later, that works on a universal acquisition of the human species, and I'm of course opening the way for a further account which actually takes culture into the picture. I didn't want to deny that there are other musical cultures than ours, but there is something which has to be explained, and Michael Trimble already referred to it - why is it that it has this colonising nature? That when people hear the grammar of a Beethoven Symphony, hear what it means really to spell out the relation between tonic and dominant over ten minutes, everything else after that sounds second rate.

Nigel Osborne: As a humble musician I would quite like to confiscate some science. Neuroscience is actually not at all inimical. For example, something that Roger was saying towards the end, the idea of being moved, and wanting to move, and feeling things changing in yourself because of musical experience. Music neuroscience has gone quite a long way in uncovering some of those things, not so that it explains anything but it can confirm something, and also mentioning musical grammatical mistakes, someone like Stefan Koelsch has done a lot of work on this, and it's interesting that the place in the brain where these things are recognised is the Broca area, that's the language area of the brain, where we recognise musical mistakes. Just to say that this science needn't be an enemy. I think it can actually be a comforting friend sometimes.

Michael Trimble: Thanks Nigel for introducing a little bit of balance into this and I hope it will continue throughout the day.