

# **The Beethoven Question: Can Art Make Life Worth Living?**

Saturday 27th October 2012 – Purcell Room, Queen Elizabeth Hall, Southbank Centre

## TRANSCRIPT

### **The Role of Art in coping with Sensory Impairment**

Introduction: Prof Michael Trimble

Music and Deafness: Dr Paul Whittaker OBE

The effects of hearing impairments on music making: Robert Fulford

(including discussion and questions with Michael Trimble, Paul Whittaker, Robert Fulford,

Nigel Osborne and Lloyd Coleman)

**PROF MICHAEL TRIMBLE:** Good afternoon, ladies and gentlemen. After a really fantastic morning, it's a great pleasure to open the afternoon's sessions. As we are concerned with sound and beautiful sound, would you please make sure you've turned off your mobile phones.

It's my pleasure to start the afternoon by introducing Paul Whittaker. His short biography is in the programme for you. He has obviously done a considerable amount in terms of helping people with hearing difficulties access music and is going to tell us a lot about the difficulties and perhaps the resonances and benefits that can come by understanding these problems. We are going to try and keep to time, but Paul if you could come up here and open the afternoon session, please. [Applause]

**DR PAUL WHITTAKER:** Thank you, Michael. Hello. Now, I have never immersed myself in Danube water – hot or cold. I'm not a mathematician and I'm not a Beethoven scholar. However, I am deaf, and a musician and I'm delighted to be here at this conference to share some of my thoughts and experiences with you.

Despite being born deaf I cannot imagine a life without music, and I know I'm not the only deaf person who says that. For me, and many others, music is a fundamental part of our lives, and for almost 25 years I've been running a charity to help deaf people – and those who live and work with them – make music.

Over the years I've been asked on countless occasions how I 'hear' and understand music, been told that I'm wasting my time, and been amused at the quizzical, "Beethoven – he was deaf, wasn't he?" as if the person asking isn't quite sure of their facts and doesn't want to appear stupid or naïve!

Most memorably, there was a syndicated news article in the North American press in 1983 that told the tale of "a young deaf man named Whittaker who lives in a small town 200 miles north of London" – that's Huddersfield, it's not that small - and who – despite being profoundly deaf – had been accepted at the University of Oxford to read for a music degree. The reason this guy had been accepted was that "when he sat down to play the piano, Beethoven came and told him what to do." Yes, I am actually a reincarnation of John Lill! Then again, as a different American journalist told me, "Never let truth get in the way of a good story."

The simple fact is, I've never heard from Beethoven and have no desire to do so! I actually think we would not have got on very well. He was a bit of a grumpy, stubborn, irritable person. But it's largely inevitable that people will – when they meet a deaf musician – think of Beethoven. They consider 'music + deafness' to be paradoxical. And it's inevitable that they will be curious and want to know 'how I do it.'

My usual response is to turn the question back on them and ask them to try and explain to me – deaf person – what thing 'thing' is that they call music, why it moves them the way it does, and how they would explain it to someone who cannot hear it.

So if I were to ask you, this varied audience of musicians, musicologists, mathematicians, academics, general public, string quartet players, interpreters, etc, etc, what this thing is called music, what would you say to me?

Silence. Good. Silence is part of music. You've all got that one right, okay. [Laughter]. We are off and running. Well done everyone, you got that right.

Erm, it is a very, very difficult question to answer. I am sure that some of you have considered it before, but the vast majority of the population don't. For many people now, music is so much a part of life that we almost become immune to it, and take it for granted. It's ubiquitous, it's in shops, blaring out of headphones on public transport and in the street (there are some advantages to being deaf, you know!) and for most people the response is, "I like it: I don't like it," and it's in one ear and out the other.

With me it doesn't even go in one ear. I can't download a piece of music, attend a concert, listen to the radio or a CD. I can't identify what voice is singing or what instrument is playing, pick up the

melody, harmony, rhythm or form. While we had the quartet playing this morning, because I do not have the score of the excerpt, I have no idea what they are playing, apart from it being a violin and cello, obviously. I can't identify what voice is singing. I can't identify what instrument is playing, I can't pick up the melody, the harmony, rhythm or the form. Music means nothing at all to me unless I see a score: I then read that and know in my head exactly what that music 'sounds' like.

I think that ability comes from being a pianist. I've never knowingly been taught how to read a score but a pianist is used to reading 2 staves, sometimes 3. I'm an organist so am used to reading 3 staves, sometimes, 4. From there it's a short leap to a string quartet and from there to a classical symphony, and so on.

When you press a piano key down you feel the hammer hit the string and the vibrations travel back up your arm. Every single note feels different. You know that 'that' note there is this one on the staff, 'that' note is that one and it's so easy to relate what you see to what you read and feel. I really don't like electric keyboard as there's nothing like the same tactile sensation.

This reliance on the score does sometimes frustrate me, musically. If I have no score I can't follow a piece, and it's an expensive business buying scores (which sometimes aren't available anyway.) Jazz is pretty inaccessible due to its improvisatory nature, though perhaps if I could play more instruments then the technical knowledge I had could 'fill in the gaps' and allow me to work out what's going on just by watching. Contemporary music is a challenge (maybe it is for most of us!) and in this case there may not be a score, or there could be electronic or other elements which are not or cannot be notated. The musician in me wants to know what a composer is trying to say but I have to acknowledge that sometimes I just have to accept defeat.

This first came home to me in my first year at Oxford when one of the set works was Harrison Birtwistle's "Verses for Ensembles." There was an exam question linked to spatial effects and to whether a recorded version of the piece could be more effective than a live one. Most of you hearing people would sit down and think: yes, of course it's far more effective, recorded, because you can put microphones around the place and soloists, coming forward and then going back in. I recall writing that I didn't think it would make much difference in a recorded version and still feel rather embarrassed when my tutor told me that, actually, it would make a huge difference. I guess it was one of the first occasions when I became aware that my lack of hearing does cause problems, and that there are instances when I'm completely ignorant of something through no fault of my own.

In my final year I had another interesting discussion with my tutor when he told me one day that I was "the easiest pupil I'd ever had to teach." I thought, "That's a nice compliment," and asked him why. His direct answer was, "Because you're deaf!" He went on to say that, when analysing pieces, I was

forced to rely on reading scores due to my deafness, and thus noticed far more detail, whilst hearing students generally just listened to a piece of music and thus missed a lot. I responded, “But surely all music students can read a score,” and found it very hard to accept when I was told that wasn’t the case at all. That was the time I realised that I had assumptions about hearing musicians and people, just as they have assumptions about deaf people.

Speaking of assumptions I always thought there were some instruments that would be very hard or almost impossible for a deaf person to play. One was a violin, Speaking as a deaf person, I think that the most excruciating noise known to hearing people is to hear a beginner on the violin. you are playing it in a bony area of the body and the vibrations – initially, at least, are pretty weak. But then I met a deaf violinist, so that idea went out of the window. When I’m asked what instruments a deaf person can play, my reply is “Any.” I get so frustrated when the old, “let’s play percussion” line gets dragged out. I hope that one thing I’ve achieved in 24 years of running the charity is that we’ve moved on from percussion and people can play anything. Yes, percussion is easy to get hold of, but please be a bit more imaginative.

What is important is that deaf people have plenty of time to have a ‘hands-on’ experience of as many instruments as possible. If you see someone on the opposite side of a circle playing an instrument that you’ve never picked up, felt or tried for yourself, then you’ve no idea what it sounds like or feels like. You need to physically handle and explore instruments and this build up this tactile and visual (and perhaps, for some, aural) library and develop an awareness of pitch, volume, etc so that you can begin to imagine what this is like when put together, and how your individual parts contribute to the whole.

Developing an imagination is, I believe, vital for any musician, especially a composer, and even more so for a deaf person. I know how to compose, and have written a few little pieces for specific people I know, but I tend to say that my composing skill is the aural equivalent of painting by numbers! It lacks that spontaneity, that something which makes it stand out. When I was younger I used to do a fair bit of arranging for the wind bands at my school and college, and I really enjoyed that. One tutor commented on my rather unusual colourings and instrumental combinations (which he said worked very well!) and I’ve always put this down to the fact that I don’t hear properly and therefore have developed a vivid imagination. Whether that’s true or not is something that we could perhaps discuss later.

I am of the opinion that any deaf person who is serious about music does have to spend a lot of time reading scores, learning about music history and about composer’s lives, etc, in order to ‘fill in the gaps.’ You have to acknowledge that your hearing loss leaves gaps and it’s your responsibility to fill those gaps through your own study.

All the above are the experience of someone who's born deaf and never heard a full piano keyboard, never heard birds sing and, perhaps fortunately, has never heard bagpipes! For people who lose their hearing later in life then it's a very different tale. Finding hearing aids that will allow a deafened person to enjoy music in that way they previously did is an almost impossible task, and over the years I have had some quite heart-breaking tales of musicians who lose their hearing and cannot bear to pick up and instrument or listen to pieces they once played and loved.

It frustrates me that I'm not more able to help people in such situations. Yet out of all the fields of music the one I'm inclined to say is easiest for a deafened person to continue pursuing is composition. I know that "The Need to Compose" is a topic we'll look at later today, and I'm speaking here as a deaf person and someone who's *not* a composer, but I don't see Beethoven's deafness as being much of an issue at all. I sometimes think of the fact that you know he was deaf actually gets in the way. It's almost, "Oh, Beethoven couldn't hear and he wrote music!" so what, big deal!

By the time he began to lose his hearing Beethoven had learned a fair amount about his craft, about orchestration. I don't deny for a moment that he was increasingly frustrated, perhaps even scared, about losing his hearing, but – from a musical point of view – he had nothing to worry about. He was, as we know, driven by a need to compose, but he didn't *need* to hear what he was composing. He had all that music in his head, he wrote it down in sketchbooks, worked things out and revised them, knew when it was right.

I recall one Beethoven biography in the 1980's that made a big issue of Beethoven sawing the legs of a piano so it was flat on the floor and thus he could feel it better, and that it was in such a bad state due to Beethoven playing it aggressively out of frustration at not being able to hear. It made me laugh and it's something I find almost too ridiculous to be true. It's a destruction of an expensive instrument, for one thing; it would be a phenomenally uncomfortable way of playing the piano, lying flat on the floor; he was quite a temperamental chap anyway; surely the neighbours would have complained about the racket; and – as I've said – he didn't need to hear it because he knew what it sounded like. I suppose it makes a good story – and I don't know if it's true - but it does reveal a lack of understanding about deafness. . Sometimes, I think Beethoven actually needs reclaiming from some of the slightly bizarre theories which go around.

It would be interesting to know exactly what attitudes existed towards deafness in Beethoven's time. This isn't the time or place to look at Deaf History in detail, though up to the early 17<sup>th</sup> century the church had long propagated the belief that a child's deafness was a result of God punishing sinful parents. Deaf people were excluded from taking part in religious worship and their status as human beings was on a level with 'imbeciles', they were often incarcerated away from everyone else and it

was felt impossible to educate them. For a long time ‘deaf and dumb’ people were not allowed to make a will or inherit property from their families.

By the 18<sup>th</sup> century attitudes had certainly improved, and some forms of sign language had develop, although within German-speaking lands the emphasis was very much on oral education and learning to speak. During Beethoven’s early years the first completely oral school in Germany was founded, influenced by the work of Konrad Amman who insisted that speech was the only thing that separated human beings from the animals.

From that angle Beethoven was fortunate. If he had been born deaf then it’s quite doubtful whether he would have had much of an education, access to music or become a composer. And even though Beethoven is probably the most famous deaf person in history, within Deaf History and Culture he’s unlikely to get a look-in at all, simply because he was deafened. He’s not really recognised by the deaf community.

At least Beethoven doesn’t seem to have been rejected by 12 universities because of his deafness, didn’t fail his LRAM diploma for “not playing for the acoustics of the building”, didn’t fail his ARCO because of his inability to do aural tests, wasn’t denied a denied a career as a musician because an exam board refused to acknowledge his deafness when it came to taking ‘O,’ ‘A’ levels or GCSE. These are all genuine cases that have happened to me or to other deaf musicians. Yet, despite those setbacks, we persevered and lived for our art. And we’re grateful to those who look at our ability rather than our disability.

Do I, or other deaf musicians, see Beethoven as a role model? Well, at the risk of shocking you, I don’t: I admire him, but that doesn’t mean – as some people think – that I absolutely adore everything he wrote and feel an affinity with him. I doubt we’d have got on, I would probably have just slapped him and said get on with it, you are not alone here, but suspect we would have shared at least some satisfaction in accepting and overcoming deafness and acknowledging that, for both of us, art is vital and it does make our lives worth living.

**PROF. MICHAEL TRIMBLE:** Paul, thank you so much for that fantastic contribution and a great way to start the afternoon. We are going to have sort of a question and answer session afterwards, so we won't have questions and answers now and I would go straight on to ask Robert Fulford if he would kindly present to us some aspects of musical psychology but in particular in terms of interactive music making with physicians, so please, thank you.

**ROBERT FULFORD:** Thank you, I want to thank Paul and Hilary for allowing me to speak today. I work with Paul on the project that I’m on called ‘interactive performance for musicians with a hearing impairment’, at the Royal Northern College of Music in Manchester. The project was inspired

by the way that the percussionist Evelyn Glennie feels the vibrations of music, and so our aim on the project is to try and find out whether vibro-tactile technology, that is the ability to feel music through your skin and through bone conduction can help hearing and hearing impaired musicians perform music together in groups.

So obviously, from everything we have heard this morning we know that there is plenty of evidence that deafness need not necessarily limit the composition of music. But my first task on the project that I work on was to find out more about musicians with hearing impairments living today and how they are able to perform music together. I interviewed 12 musicians with hearing impairments and it was not surprising for me anyway, to find out that the motivations for them becoming musicians are no different from anyone with normal hearing. This is a quote from Ruth Montgomery, a profoundly deaf flautist. She says "I was struggling at Primary School when I was younger, I didn't have anyone to help or tell me what the teacher was saying, and I was the only deaf child in the class. But when I went home and had piano lessons, I felt like I was given something, I found music such a source of comfort. You know it was a gift really and it makes me feel good, it makes me feel better and I was always progressing."

So that is actually an example of - there were a few occasions in my study - where deafness, in a strange way facilitates music making. Ruth comes from a very musical family; this seemed to be a key factor in helping children deaf from birth access and experience music. Musical self-efficacy, how confident we feel in our musical abilities are very important. This is a quote from Ann, a profoundly deaf professional viola player "it is very easy, you get your fiddle out, and it's a very easy thing to prove". She was talking of her experience auditioning to get into musical college in London, which, for some of the people I talked to, auditioning for music colleges, was the first time they had come up against any kind of social stigma or prejudice about being a deaf musician, and although Paul has mentioned that Beethoven lived in a different time necessarily to where we are today, we are much more modern in our thinking about disability, this stigma and prejudice still exists.

So, the social part of the challenges are only part of the story. The biggest musical challenges reported were about staying in time and staying in tune with other players in groups. So, the next quote I have is from Nick, a profoundly deaf pianist, he was talking about playing a flute duet, saying, "I was not prepared for her part even, was a bit optimistic, found that very difficult and just kept getting out of sync with each other." And this next one is Ann again talking about recording a film score in the studio with her professional orchestra.

"So if I am in charge of my section, maybe ten people and we are all wearing a click track, and I can't hear it, that I find difficult." So she told me in that situation, everyone else in the orchestra would have the click track on head phones, she would feel silly not wearing them as well, but she made the point that she gets no auditory feedback from that at all. So the ensemble synchrony with her players is achieved visually.

But of course, staying in time and staying in tune with other players is not a problem if you are playing or composing by yourself. So there is a big difference there, and that is one that we need to keep thinking about.

Paul has already mentioned the importance of the notated score being central to his experience of music. Nick also felt this way, Nick has absolute pitch and so when he reads a piece of music, a score, he forms what he considers to be a perfect representation of the music in his inner ear. We might call it auditory imagery, but it does relate to Beethoven too because I think we expect composers, all composers, to have a good inner ear and the question or not of whether they are using the piano to confirm the output of their inner ear, you know, it is a question of whether there are links between auditory feedback, which is what we can hear, and the auditory imagery itself. Once we know a bit more about that relationship, then we are in a better position to explore how deafness can affect the composition process.

In the interview study almost half of the information was about negative experiences in music making, which are similar in a way to the kind of negative experiences Beethoven went through, but actually a lot of them related to experiences of playing or performing with other people in the real world in musical situations, so not just a social or a personal feeling of loss with regard to the hearing impairment but an actual conflict between music and deafness in a professional situation, which can really affect musical confidence. Concealing deafness produces a lot of stress and anxiety for musicians, and changes in hearing level are very, very stressful as well. One of my participants reported to me, every morning, waking up, and having to click beside her ears to see what her hearing was like that day, it might be worse, better or the same. But always never knowing is what causes the stress and so, during the time that her hearing was deteriorating, she was putting hours and hours of practice in on her instrument.

The next quote I have is actually from the fabulous mezzo soprano, Janine Roebuck, who is sitting here today. This is about a strategy which all musicians use when they make music, rigorous preparation or practice. She said: "I would prepare my music inside out and backwards, I would have to know it really well, so I would note bash, note bash, note bash." Although this is true for all musicians, I think there may be differences emerging in the sample of musicians that I worked with, differences to the extent to which musicians with hearing impairments, rely on memorisation as a strategy in music-making, that would extend not just to memorising your own part but to memorising other people's parts as well, so you know exactly how yours is fitting in with other people.

Another strategy was the use of visual cues including watching for people raising wind instruments, watching for singers breathing. This is something that Paul reported quite frequently. This next quote is from Phillip, who played flute and piccolo in a professional orchestra for 40 years. He said: "I tend to look over and see when she picks it up, the oboe, just down the line". Normally you would count

the bars but the cues are there to confirm, so he was using visual information to confirm what was notated on the page. This experience was quite reported frequently by my participants.

This is Ann again, saying “everything I do in the orchestra is visual”. What made Ann special was although she is profoundly deaf she doesn't wear hearing aids in the orchestra at all, which shows the real extent to which ensemble synchrony in music when you've got a group of players can be completely achieved using the eyes.

String instruments provide a lot of visual information when you think about it. You can see the pitch of notes from the position of the fingers on the fingerboard. You can see the duration of the notes with the bowing; you can tell by the movements of the musicians' bodies the kind of expressive manner that people are playing.

She reported using muscle memory in her fingers to tune her instrument. Her desk partner would tune the lowest string and she would use muscle memory to tune all the others, but physical feedback as well can be used to keep time with other musicians. So this is Ruth again, talking about playing guitar duets. She said: “my father would put his foot on my foot to keep time. He will tap my foot and I can feel the beat.” That is an example of physical feedback in order to help the ensemble synchrony.

Another important strategy that emerged was social feedback which is simply asking other people to tell you when you are not in time or in tune. This is Janice, a singer with a moderate hearing loss: “I have always told people since I was very young, if I am ever not singing in tune, just tell me.” But with the social feedback that depends very much on the context. So if the performer feels able to be open about their hearing impairment or not, and in professional musical working environments that is actually not always the case at all.

So, one additional strategy as well that came out was the use of vibro-tactile feedback. Paul has already mentioned this, that he prefers playing acoustic pianos as opposed to electric keyboards, because they provide a better sense of the instrument and the sounds through the vibrations and the physical act of playing.

Electronic instruments nowadays have the potential for vibro-tactile feedback as well on the skin. There is a musician and performer I talked to who uses a vibro-tactile glove to provide vibrational information about the music she is performing and improvising as an addition sensory feedback. There are also modern day equivalents of the Beethoven piano-leg trick. There are vibro-tactile feedback devices that help composers compose, if the auditory feedback loop can't be made using auditory information alone. You can substitute that with vibro-tactile information.

The idea that performers can get a sense of their music is also plausible when we think about the way that Evelyn Glennie works, but the idea that vibrations can help groups of performers at one time is the big step we are trying to take on the project at the moment.

The point really is that sensory compensation, this idea that if you can't get information from an auditory source you can use your eyes, you can use your body - this is something that is very

important in music making. Music making is multimodal and the information is out there for us to perceive when we really know it.

The experiments that we are doing on the project to do with feeling music through the skin have shown there are limitations in terms of what we can actually feel, how high or low, what intervals we can feel, so those are the things we are exploring more. We need to learn to use our eyes and ears in different ways to suit our needs - that is something that emerged very strongly from my study.

One specific example was to do with different ways of using auditory input and this related to people's differing preferences for hearing aids and to whether they were born with their hearing impairment or become deafened later in life. With such a small sample it is quite dangerous to categorise like this, because not everyone fits these ideas perfectly.

For example, Paul and Ruth who have their hearing impairments from birth, both for a long time preferred the older analogue style hearing aids because they were a lot more powerful and did not distort the pitch of music to the extent that digital hearing aids do. Lots of people have big problems with digital hearing aids because they distort the pitch of music; they are designed for speech, quite rightly. But what I found was that Ruth and Paul were very much open to receiving and to using all the auditory information they can get so we might call them auditory attending musicians. What I found with musicians who were born hearing but now have mild or moderate hearing losses later in life, were usually given digital hearing aids from the mid 90's onwards but tended to be discriminate about whether they listened to the input or not, in musical situations. So having memories of what music should sound like, meant they could tell whether it sounded right or wrong, and they knew when to ignore the auditory input and when not to, so using discriminate attending there.

Musicians like Ann and actually Evelyn Glennie are in this last category, who were born hearing but became profoundly deaf in their teens, both in music preferred not to use hearing aids at all, and to find completely new ways of listening. For Evelyn with her percussion she listens with her skin and with her body, with Ann playing in the orchestra, arguably she listens with her eyes which is a strange concept but, they really were auditorily non-attending.

These are just some findings from an observation study I have done recently with musicians with hearing impairments. What I found is, that small levels of attenuation in someone's hearing do not affect the amount that players look towards each other and the amount they move in music. With musicians with real impairments, they do affect our musical behaviour. I found that profoundly deaf players looked towards each other, looked towards their partner significantly more than hearing players which nicely confirmed what they were telling me in the interview study beforehand.

What was interesting in this study is that the hearing players were looking towards their partners more, the greater their level of hearing impairment, suggesting that they were modifying their behaviour for the benefit of their co-performers.

There was another effect in terms of the proportion of talk spent in rehearsal: musicians with hearing impairments spent a longer proportion of time in rehearsal talking, because it's important to establish

things like dynamics, tempo changes, phrasing, stylistic interpretation, all these things in advance, because they may be less able to do this on the hoof while they are playing.

So, what can we learn from all this? This is a quote from Ruth Montgomery, she says: “music is not about hearing anymore than language is”, making the point that music is so much more than just hearing, that it is a way of communicating with other people and expressing yourself, not just because we need to interact with other human beings, but because it is creative and intrinsically rewarding. The music/language analogy is good, because there are many ways in which music and language are similar.

Another participant said: “I think musicality is something that exists irrespective from hearing.” Now, both of these sound like big philosophical statements, but there are clear scientific reasons why they are true. The way we understand music is much more complicated than the way we hear, our hearing mechanism. We picked up on this in the film, this difference between hearing and listening. Music can remain unaffected by the worst cases of amnesia or aphasia, where it may be that the case of singing or playing music are the only things that a person can either remember how to do or the only way they can communicate. These stories and many others like this come from books by Oliver Sacks and Dan Levitin but the real point is that the reason these stories exist is that music is processed in many different parts of the brain. For example, there is a structure in our brain that processes our interpretation of structure over time in language and that can be spoken language and sign language as well and it can also be structure in music.

So it is not really surprising that our ability to hear with ears does not have a great effect on our ability to be musical. But what is more surprising is that there is still a stigma today or an idea that a deaf musician sounds like a contradiction in terms.

This is from Evelyn Glennie's web site: “The definition of the category deaf, i.e. not being able to hear sound, and the category of music which is sound are mutually exclusive. My career like that of Beethoven and a number of others is an impossibility. There are only 3 possible explanations, I am not a musician, I am not deaf or the categories of music and deaf must be incorrect.”

Of course the last statement is right. Just because someone is deaf doesn't mean they hear nothing and that's especially true today with cochlear implants and hearing aid technology although neither are fantastic for music perception as we are learning. Music is also much more than we perceive with our ears. People who lose their hearing later in life do not lose their musical abilities. People who are born profoundly deaf may still have an inner sense of knowing that they are musical. They may want to learn about music, they may find that they are good at music and they may then grow up to identify as musicians.

The interaction between musical and deaf identities is very complex and can change over time, and we can think about how it relates out, into the real world, but within my study I was able to find three different kinds of narratives, three different kinds of stories, with regard to identity. Some people talk

about overcoming deafness, and we've already used this term "overcoming deafness", in relation to Beethoven, but again Paul arguably had to overcome deafness when he was rejected from 12 universities, but not everyone has to overcome deafness. Some people feel that they have to conceal deafness, and that was especially true for the participants in my study who have mild or moderate hearing loss and are working in professional orchestras, which can be very stressful. Others are able to integrate music and deafness, and these are not mutually exclusive stories, they can apply to anyone at any time and it can change over time. There's a composer called Ailís Ní Ríain, who draws on her experience of increasing deafness in her musical compositions, which involve musicians and sign language, but others integrate music and deafness in different ways.

This is a quote from Paul's colleague Danny at Music and the Deaf: "even if I didn't hear and I thought it was lost or whatever, I would still have found a way. I had encouragement from my parents and my teachers and because I was exposed to music everyday it felt natural for me to take an interest in it. I never saw deafness as a barrier to music. I never felt that I had to overcome my deafness so that I could enjoy music."

He felt very strongly that these ideas of overcoming deafness just did not apply to him. So what this tells us is that the experiences of musicians with hearing impairments today demonstrate that musicality, the way in which people respond to and make music, is not constrained by physiological limitations on hearing, and considering how Beethoven was affected by his hearing loss, as Paul has mentioned, we need to think about what attitudes to deafness were like in his time? We've already looked at some musicological evidence about the way in which his musical imagery or his inner ear was affected by changes in his hearing level but what other things might have affected his state of mind? I also want to say that conservatoires today are much more enlightened about deafness than they were. Lloyd is an example. We know that a musical career should not be ruled out on hearing alone, and we've learned that a hearing impairment does not and should not prevent music from becoming a means of self-expression and a source of wellbeing over a lifetime, and that point came across extremely well in the film, I thought. Thank you. [Applause]

**PROF MICHAEL TRIMBLE:** I'm very pleased to say that we have a lot of time for discussion because I think some of the issues that have been raised by these two fascinating presentations really require a lot of thought and a lot of discussion. For the first part, we are going to have an in-house discussion up here, but then I will open it up to the audience, if you can hold on to your questions. But I need to invite a couple of other people, Nigel and Lloyd, to come up and join us up here at the top table. I'm very sorry that the lovely arm chairs, Nigel, which were here earlier seem to have been removed and you are going to have to sit in a hard chair, not a soft one. Perhaps what I will do is throw around some questions from here and then we will have some audience participation.

So, here is something that just puzzles me and I picked up the question that Paul said, "You know

what a piece of music sounds like" from looking at the score. Now, this has profound implications, and I'm reminded of the philosopher Bryan Magee who tried to have a dialogue with another philosopher who was blind. He wrote a book about this interaction. Remember that a lot of philosophy has to do with visual inputs. How do you gain knowledge by seeing things? And he was very interested to understand how a blind philosopher could develop certain concepts, for example what the colour red was like. The dialogue became very acrimonious and at the end totally broke down because the philosopher who was blind lost complete patience with Magee, because Magee couldn't understand what it was like to be blind and to understand what he was experiencing. Now, when you say you know what a piece of music sounds like by looking at the score, I have a - I mean, I can't look at a score and do that anyway, but what actually does music sound like when looking at a score? To you? What are you actually hearing and how is that different from what somebody else who can read a piece of music and hear it?

**DR PAUL WHITTAKER:** Because over the years I have played and felt lots of different instruments. That means that when I do look at a score I have that idea of tone, of colour, of instrumentation, based entirely on that physical sensation.

**PROF MICHAEL TRIMBLE:** So it's a physical sensation?

**DR PAUL WHITTAKER:** That's my short, simple answer. [Laughter]. I never thought about it until I got to university. For 18 years of my life I just got on with making music, and I never thought about how I did it. It's the most natural thing in the world for me to do it. People came up to me and said hi, what are you doing? I said I was making music and before they could run away I would grab them and say no, this is the way I think I do it. As I said earlier, it's not something that I have knowingly been taught. It's something that either has compensated for my lack of hearing, so I've developed that sense of vision and of touch - I don't honestly know. It sounds a cop-out, but what I usually say in similar situations is - and this is not what you want to hear - I don't really care how I do it. The important thing is that I can do it and I can share it with other people. Cop out, cop out!

**PROF MICHAEL TRIMBLE:** Well, no, but it has huge implications. Nigel, when you look at a score that you've never seen before, do you hear that music in your head, if you like, from just looking at the score, and how do you think that experience differs from that which Paul has just told us?

**NIGEL OSBORNE:** The answer is yes, but it took me quite a long time to train myself to do that. What I'm doing is I'm drawing on my memories and knowledge of the sounds and colours of instruments and their different ranges, as well as what pitches sound like and what durations, how long they last, and I'm putting that together in my head. If I'm lucky, like I was doing it with the Beethoven quartets, I can just do it with a quartet and I can hear it; with a complex symphonic score I might have to put it together in my head and do it section by section, then put it together. I suspect

I'm doing it in a very similar way to Paul, in that my impressions of the colours of instruments and my memories of this frequency information, spectral information which is in my brain which I don't think is going to be all that different to the spectral information and vibrational information which Paul has used, which may be bone conduction, it may not be, it certainly sounds like it's cutaneous, and that's what was said this morning. I'm not quite sure where human brain research has got with this, but with our near relatives, the macaques, there is definitely a pathway from the cutaneous vibrational senses actually invading the auditory cortex. In other words, the bit of you that is thinking about pitches, that information is going straight there, so my guess is that we are probably very similar and there may be a slightly different brain representation, possibly; possibly not. Maybe identical. But I would have thought we are experiencing very much the same thing.

**PROF MICHAEL TRIMBLE:** Lloyd, you wanted to say something?

**LLOYD COLEMAN:** Just to return to the basic question really of how one can hear a score by looking at it, I guess surely it's just a bit like any sort of language? You know, if you look at words on the page, we can hear those words in our head if we are reading a book so reading music is very much like that really, but it takes a lot longer to train yourself to do that as a composer or as any musician. In my case, I started studying at the Royal Academy about three years ago, I arrived at my first composition lesson and said to my composition teacher, Gary Carpenter, fantastic teacher, "I'm a bit worried because in my room". I was staying in halls of residence with the University of London, it's a very small room as most student accommodation rooms are, so I couldn't fit a piano or even a keyboard in there so I was worried about this and I said to Gary, "I'm worried that I don't have access to a keyboard or piano to write my music", and Gary said straight off, "that's a fantastic thing, you should see that as an advantage. It's great that you don't have a piano or keyboard to work with and I want you, Lloyd, to go back and for the next year develop your inner ear as a composer", and my compositional skills in my inner ear, as we refer to it, have improved immeasurably as a result of that advice.

**ROBERT FULFORD:** Just to reiterate what Nick had told me, one of my participants. When I put to him this idea that obviously we don't all have absolute pitch, but that doesn't affect our musical abilities. Sometimes having absolute pitch can be off-putting in certain musical situations, but to him, his absolute pitch ability was central to his ability to be able to read music off the page, and it was very personal and sacred to him, and so the idea that he would be able to do this without having absolute pitch, he wasn't able to really get his head around that. But I was left with the definite impression that, you know, what he was doing was an extension of what a lot of musicians do, but growing up deaf he had really taught himself how to read a score and to hear it in his brain.

**PROF MICHAEL TRIMBLE:** To hear what in his brain is what I'm interested in.

**ROBERT FULFORD:** Well, I only ever listen to what I am told and use the words of what I am told. It is not for us to try and work out whether or not his representation is right. That's un-testable. I can't test that.

**PROF MICHAEL TRIMBLE:** This is why Bryan Magee fell out with his blind philosopher. Nigel, you are itching to say something.

**NIGEL OSBORNE:** There's no reason it should be very different. Sound is compression of atoms in the air and it can be picked up by various different mechanisms in the body. If we back up we can do it in different ways, so I suspect that the brain representations are either different in everybody or exactly the same. Who knows? It doesn't matter because that actual information is the same, and, you know, it's exactly the same information that's coming.

**DR PAUL WHITTAKER:** I don't have absolute pitch but I have a very secure sense of pitch. I'm an organist. If I ever find myself in a situation where, for example, someone is playing or singing a hymn or a song in a different key from the one that I've always played it in, I cannot join in unless in my head I mentally transpose the entire score into the same key that it's being played in.

**NIGEL OSBORNE:** Could I ask, Lloyd, how do you - obviously with partial hearing presumably do you put it together from two sources, from tactile and hearing or do you get enough air information to create the image in your mind? How do you do it?

**LLOYD COLEMAN:** Yes, it's difficult to sort of give a round answer to that, but I think as a clarinet player, I play clarinet as well, and part of my clarinet lessons - a big part with Jo Patton in Manchester - was talking about vibro-tactile feedback, and even though I am only moderately to severely hearing impaired in both ears, I use my hearing aid to find my way around the world, despite that Jo was still very interested to ensure that I could use my hearing impairment as an advantage, and with wind playing that is critical because, if you look at string playing, you know, the string quartet, everything that they are doing is on view to the audience. We can see what we are doing whereas, when it comes to wind and brass instruments, you cannot actually see everything that you need to be able to see. So, you know, visual examples and just going, "Oh, copy this", with a wind instrument is not going to work. So Jo was very, very effective in teaching me in such a way that I was able to use my impairment as an advantage and I think therefore I had a heightened sense compared to maybe some of my colleagues of how a good, solid, round creamy lovely clarinet sound feels like, and not sounds like.

**PROF NIGEL OSBORNE:** Yes. As someone who tries to write music too, I feel sound as much as I hear it. Probably like Lindsey, I may well have to face deafness, I have Ménière's disease, I may have to deal with it, and by the way I always thought that Beethoven was being a wimp with the

Heiligenstadt Testament, so I've taken great heart from your view of that. Of course, for goodness sake - no, I thought that was great. As someone who might have to face this, very probably, I would wish to take your approach. But yes, in fact I feel sound as well.

**LLOYD COLEMAN:** Of course, everyone does. If you take a really obvious example, if you go to a symphony orchestra concert and you have the end of a Mahler symphony or something, the timpani are pounding at the back and the bass drum and the cymbals and the strings and the bass trombone, everybody will feel that – you may not think you can, but you do. I'm sure that a lot of people in here are aware that they can feel music but there are quite a lot of people as well who aren't aware of that aspect of it and it's just awareness of it really.

**PROF MICHAEL TRIMBLE:** Well, of course feeling the music is the difference between actually going to a concert, being there, and listening to it on the CD. But Nigel, you are talking here about what one might call some synaesthesia, I know you have an interest in that, and I wonder if you could put that into context?

**PROF NIGEL OSBORNE:** Yes, synaesthesia, the idea of bundling senses together, I think that has been an essential part of human survival for all of us, to be able to collect together what the senses are telling you in one instant, you might need to do that or you are not able to pass it, I'm seeing this, I'm hearing that, vroom, this is the message, I'm going to run, it is important. And I think the example of the cutaneous senses into the auditory cortex, in other words, the interesting thing about that research is that everybody imagined that the link-up of information came later but no, it's very early, and there may be other such relationships in the brain we don't know about yet, but certainly the cutaneous auditory cortex is very early in the process and it shouldn't be out of the question, or factually impossible. Other stimuli may well be combining at earlier stages in our mental neurophysiology than we had imagined, and obviously some of these are very strong in the music world. The common one is colour. And pitch. Very interesting story about that. I met not long ago the world's first official cyborg. His name is Neil Harvison, he is from Northern Ireland and Barcelona - a great combination - and what happened is that Neil is colour blind and decided he wanted to have the sensation of colour so he got himself fitted out with a colour sensor that could trigger audio. In other words, that would convert electromagnetic information of colour into audio information, vibration, and he had that implanted in the back of his head. What's really interesting is he now hears colour, and the reason he went for the bone conduction was to be able to separate it - this is interesting, in this way - so he didn't want to have the perceptions he had of visual perceptions interfered with, so he wanted to be able to process - he didn't want hearing interfered with so he went for the bone conduction thing and he has got it to a situation where, as to knowing colour, there's one octave of colour, so he puts that into one octave of pitch, and within there you get the gradations through the spectrum of the colour, and what's really interesting is he can now hear down to a 32nd division of a

tone. It gives a lot of hope to everyone, I think, just through practising and practising and practising, so he can hear the shades of colour. Another lovely thing is racism is dead because when he looks at everybody's skin it comes out orange. [Laughter]

The serious part of this is that there is this wonderful crossover of things human beings have developed for their survival and the enhancement of their lives from the beginning, and I think we should be exploring them and using them.

**PROF MICHAEL TRIMBLE:** But he still didn't see red? Let's move on, a little bit more.

I was fascinated by people reporting that if they lost hearing in one ear, this had a profound effect on their appreciation of music. I think a lot of people as they go through life lose hearing in an ear for various reasons like accidents or whatever. I am interested to know, well perhaps we will ask the audience in a moment if somebody has lost hearing only in one ear and what effect that has had, but again in terms of theory, why should hearing loss in one ear alter one's appreciation of music, if you lose one eye, you don't lose three dimensional visual information, you lose some of the visual field. I wonder if someone wants to comment on that?

**ROBERT FULFORD:** I suspect that that again it comes down to this difference of what you have been used to, whether there is a change, so, for the gentleman talking, he had obviously been used to hearing sound and music through two ears and for that suddenly to go down to one, I suspect the way he was describing it sounded flat in comparison to what he had before. I worked with a musician in college, who has been profoundly deaf in one ear all her life; I suspect for her that she would not use the word flat to describe the experience of music. She is a musician and loves music. She plays the double bass, which nicely delivers sound into her good ear; it hasn't stopped her development as a musician. I suspect that the comparison of the change later in life has something to do with that.

**DR PAUL WHITTAKER:** I have a colleague who is 24; he has been deaf in one ear all his life, spent 3 years at Leeds College of Music and another 2 years doing a music course. It was only earlier this year when he first contacted me that he actually told anyone that he was deaf. As far as I am aware, he's not had any trouble coping with one ear. I find it very strange if I have one hearing aid in and one hearing aid out. Even though my hearing aids do not help me to hear, I am still reliant on reading a score or my memory, it is absolutely horrible only having one hearing aid. It is something to do with the sense of balance. I prefer to have both in or no hearing aids in at all. I am told I sing far better when I have my hearing aids out - maybe someone is trying to tell me something there!

**PROF. MICHAEL TRIMBLE:** Perhaps this is a good time to throw it out into the audience?

**NEW SPEAKER:** My name is Lena, I am a hearing therapist at the Royal National Ear Nose and Throat Hospital. Ears are very strange things but they are quite nicely positioned on either side of the head and this actually gives the brain very important information about spatial differences in sounds, so if I was to simplify it: if I looked straight ahead and someone clapped on the left, that sound would arrive at my left ear louder and quicker than my right ear, and my brain senses the difference in that

information. When it comes to music, very rarely are we looking dead on at an instrument and just listening to it. It is usually a variety of instruments differently positioned around us. The brain, while it is trying to analyse the spatial differences, gets the sense of architecture of the music. I really love this about Nick Coleman in Lindsey's film, where he talks about envisioning the space that the music occupies in a room when he's listening to it. He was so badly affected when he lost the hearing on one side because one of the first things he noticed that was different was that he couldn't get that spatial awareness of the sounds and the different instruments and it affected the architecture that the music accompanied for him.

If someone had only had hearing in one ear, then their sense of architecture will be developed from the sense of hearing in the one ear. Therefore they don't lose the difference in architecture.

**PROF. MICHAEL TRIMBLE:** Thank you, that's extremely helpful – is there anybody in the audience who would have a personal experience of this?

**LINDSEY DRYDEN:** Hello, yes, I've been completely deaf in one ear since I was 3 and it is all I can remember. So, when I was working with Nick we both understood that we were both deaf in one ear, exactly the same ear, but for me music has been always rich and full and beautiful because that is how my brain has learned it. I don't remember hearing before I was 3 years old, for me it is every bit as rich as it could be. For someone who has always heard with two ears, I think, as you said, it is very much about comparison - if you lose something, your brain has to catch up with what is different. If your long-term experience is simply one-eared-ness, then you don't necessarily have problems.

**PROF. MICHAEL TRIMBLE:** Anybody else who wants to confess to having problems with one ear?

**LLOYD COLEMAN:** Just before we go to the comment there, that relates to what you said Nigel in the film, that nobody's hearing is perfect. Everybody has a hearing imperfection, it's just the sociological expectations we have of each other and what normal hearing is. There is no such thing as normal hearing.

**NIGEL OSBORNE:** Exactly. Tomatis always imagined that he could tell you what crisis you had in your life and when by looking at your auditory deficits - your traumas are marked out in your ear.

**PROF. MICHAEL TRIMBLE:** Yes there was a question in the front.

**NEW SPEAKER:** My hearing is pretty ok, but I have severely impaired eyesight, and I've been finding today absolutely fascinating because there is so much that by analogy I can relate to my own situation in what I have been hearing but I wanted to, I hope justifiably, correct what Stephen said a minute ago and that is such sight I have is only in one eye and I see a 2 dimensional universe. I always have and I have been told that anyone, even if their sight is better than mine, who has sight in only one eye doesn't have perspective vision.

And so I have to be hugely careful as do others like me, walking around the world, because nobody has thought to put some lines around the edges of steps, I can't see them. You know, it looks like a flat plain. When I walked in this room, I had to walk carefully in case of steps that hadn't been

marked because while music is something that we more choose to listen to, getting around the world visually for our own safety; I think we have to learn. We learn to build in the perspective as we go along as best as we can. But I think the eyesight situation is very much analogous to the hearing situation, I was interested to hear about that today.

**PROF. MICHAEL TRIMBLE:** Thank you, there is another question behind.

**NEW SPEAKER:** I don't think you learn in the sense you think you are learning. What happens from all the experiments I have done, for example, if you damage one side of your body, of your skin for example, you have a contra lateral increase on the left hand side to compensate for your loss on your right hand side the same is also true of your carotid artery, so our nervous system has a way of compensating for any loss we feel. We learn because our nerves have now increased and our neurotransmitters function which makes us do all the things we do, have also increased and this explains why one can see music and it is nothing to do with hearing. You can visualise music and you can see colours but you may be deaf. I think it is definitely an increase of various neurotransmitters, there is a compensatory mechanism in our bodies and we are very thankful that we are like that.

**PROF. MICHAEL TRIMBLE:** Well thank you for that interesting contribution. It does raise just one interesting question: when the infant is growing up, if it has damage to those parts of the brain that lead to articulate language, propositional language, if the damage is really very young, maybe before the age of 3, the brain will compensate for that and language will, we know later on the older the child gets, if you lose language parts of the brain you have very little chance of recovering language. I am wondering if we know anything about that in relation to music. There must be children for example, it is difficult to think of, but who are barely exposed to music. There are case histories who have never been exposed to any richness of music earlier on in life maybe because of childhood abuse or whatever. Do we know anything about when musical, I say appreciation, rather than just hearing - actually listening to music becomes an important part of childhood development.

**PROF NIGEL OSBORNE:** In the womb. I think it is part of the mother's voice is very important; I put music in the same place. If I can explain the background, I work on a theory called communicative musicality, extensive work with mothers and infants around the world with their oral dialogues, the motherese, which some people say, oh shut up you're being silly, which is actually part of a profound communication, it seems to me already in the womb and then early in the baby, a very, very important thing is taking place in that the sound communication is our first empathy, it is the first laying down of templates of thinking and feeling and it is the first narrative, it is the first provocation of coordinated movement. So it strikes me as being an essential evolutionary developmental thing for children. Children of mothers who are depressed and can't vocalise have their development arrested as a result of that. It seems to me an essential developmental tool for a child, definitely in dialogue with mother, setting all kinds of processes that are important for a child and the point being also that the deaf baby getting it too, through being close and touch and feeling the voice. It will have got it in

the womb anyway, the vibration of the placental area. I think that we are on a level playing field with this. I think it is essential for child development.

**LLOYD COLEMAN:** I was very interested to learn that I wasn't diagnosed as a deaf baby until I was 5, so the diagnosis of me being hearing impaired was very late on. My mother was convinced that there was something wrong, you know if there is something wrong with your child. She'd had my brother before me and the second child wasn't behaving in the same way as the first, so I am interested, I don't have a comment really, I am just interested to hear you say that. I wondered if - my speech was obviously impaired then, I started to speak a lot later, and I'm also told that as a child, despite not speaking or despite not responding to external noises, I would actually sing nursery rhymes and have been reliably informed by a few more people, it isn't just my proud mother, a few people have corroborated that evidence. So that is just an interesting thing, I have wondered if that has got anything with me to do with me being musical?

**NIGEL OSBORNE:** It's very likely – it seems to me you have a good mother, who has been very communicative with you orally and emotionally. You have got it in the womb for sure and getting it through physical contact after and it seems to me, that that could have made it even more valuable to you, if the more rarefied pitch information of speech wasn't getting through, but these basic emotional trajectories of sound were getting through, that would seem to me for every reason to be a composer.

**PROF. MICHAEL TRIMBLE:** Lots of questions, I will be fair, start on the right and go to the left. So first, over there.

**NEW SPEAKER:** I am just very aware that a lot of mothers now don't speak to their children, they speak to their phones and I am just wondering if that has the same effect as speaking directly to the child. Because they spend most of their time pushing the chair and their phone is clamped to the ear. They don't pay any attention to the child. That would have an effect?

**PROF MICHAEL TRIMBLE:** Yes! Someone say it, yes!

**Dr PAUL WHITTAKER:** I am going to throw a curve ball here. What if you are a profoundly deaf mother with no speech who sang, and you have a deaf child, what do you do there?

**PROF. MICHAEL TRIMBLE:** I think that is a fascinating issue, if a deaf mother has a child who is not deaf, how that related to musicality.

**PROF NIGEL OSBORNE:** I don't think usually that the things that showed up in our research were depressed mothers that had an effect. I think that a deaf mother finds all kinds of ways of making sounds and communication, I can only imagine it as an enriching rather than impoverishing thing.

**NEW SPEAKER:** Thank you, this is a question for Paul Whittaker about hearing music through reading a score. Has it ever happened to you whilst reading a completely new score that you are moved to tears, that you cried because it was so beautiful?

**Dr PAUL WHITTAKER:** Oh yes, sometimes I tend to say that reading it is preferable to experiencing it live or recorded. But there are certain bits of music, there are things, which make you think, oh, goose bumps, absolutely yes.

**PROF. MICHAEL TRIMBLE:** One row back and four people along.

**NEW SPEAKER:** This last contribution gives a link to what I wanted to ask but going back to an earlier part of this afternoon's contributions. I am interested in the question of memory. There are two aspects to this, one is for example that obviously Beethoven has been a major topic in this the fact that towards the end of his life when he was trying new combinations of instruments in his orchestration, he got the balance wrong. So, something that was remembered wasn't anymore a help. Now I want to think of a more radical thing, supposing you had somebody who was completely deaf from birth. Can we have any kind of clue as to how that person would respond shall we say to particular intervals; to particular sound colours even though he may be able to pick up cues through skins, through touch or whatever. I mean we have a clarinettist there, take the second bar of the slow movement of the Mozart clarinet quintet. That appoggiatura on the first beat of that bar coupled with the particular sound of the clarinet and the low pitched string chord against it. The emotional impact of that, is enormous actually if one hears. Now I can imagine that somebody who has some kind of memory of hearing it can pick that up again through these other cues but have we got any way of approaching how somebody who has been profoundly deaf from birth can respond to that?

**PROF. MICHAEL TRIMBLE:** I am sure all 3 of you would want to answer this one?

**DR PAUL WHITTAKER:** As you know, I have not heard properly but been exposed to, and experienced a lot of instruments and lots of music, so part of that is memory. Part of it is imagination. I don't know really what else to say, when you first started talking, it made me think of John's comment this morning about the pan harmonicon. Every week I get e-mails from somebody, going ooh, I am creating something and I am doing a research project so I can help deaf people hear music. I respond to all of them as politely as I can because there are people who genuinely want to find some way of making music accessible. I don't put them off at all but another part of me thinks why do you need to? I am perfectly happy hearing and understanding music in my own way.

Would I like to be able to hear? Not necessarily, but I've never been able to hear so I've nothing to compare it with. It would be interesting being able to hear but it wouldn't necessarily be better. So maybe I'm just weird. [Laughter]. Maybe I'm the exception to the rule. That's why I - you are very similar to me. I can talk to you, I don't need to explain things.

**PROF MICHAEL TRIMBLE:** Lloyd, do you want to comment on that?

**LLOYD COLEMAN:** Yes, I can't really answer the question about a profoundly deaf or completely deaf child from birth because that's not my situation. And Paul has done his best to say what he thinks about that, but the memory thing is absolutely for me on the ball. With Beethoven, if we turn back to Beethoven, and some of those interesting textural things we were talking about in the string quartet this morning, and if you look at the ninth symphony and some of the unidiomatic choral writing, some of the later piano music, some of the incredibly heavy and sort of gravely, low bass, left-hand bass piano music writing, which for a lot of other composers at that time, and certainly just

before Beethoven, you wouldn't - you just know that Mozart or Haydn would never, ever have done that sort of writing that Beethoven ventured into, and I do think that it's partly to do with the deafness. I don't know, I feel like I'm putting myself out on a limb there, but I think it does have quite a lot to do with his increasing deafness. I haven't written a book about this so I can't give you all the evidence but I just have a hunch that actually, as his hearing deteriorated - I think what it did maybe is it gave Beethoven a certain - because he was so isolated and so enclosed, you know, off from the world, it gave him a certain sort of doggedness, I think. It takes a certain sort of person to be adventurous and to create music in that way, and I think Beethoven's personality might have been influenced by his deafness and then that will then have influenced his music. I'm not explaining it very well but that's kind of what I think, possibly. Book's coming out next year. [Laughter]

**FROM THE FLOOR:** Can I ask Lloyd about polyphony and about whether being impaired in hearing - and possibly in Beethoven's case he was possibly better able to hear independently moving lines simultaneously which is a very tricky thing. Even accomplished musicians find it hard to hear two lines when away from the score, all pianists struggle with it, and maybe Beethoven was able to hear them and therefore be more creative. And to add to that, can you trace, in the development of his style, a theme like that? For example, his later piano music is much more polyphonic than his middle period.

**LLOYD COLEMAN:** Hearing polyphony for me, I don't think it's a particular issue. I think it's partly because this is the thing about memory again, and expectation, so I'm just going to slightly go back again and talk about filling in the gaps because I think this is really important, an expectation. You know some people - I get the sense that some people are almost surprised about this idea of reading the score and hearing it. What we didn't say earlier, sorry to go back, but we didn't say also that there's this element of expectation in a score, in a Beethoven score, and as a composer I study Beethoven day in, day out, and music from that era, and so I have an expectation of what that music is going to be like. Of course, that is partly the reason as well why contemporary music, the sort of music that I deal with a lot as well, is far, far harder to read on the page, (a) because it's atonal and so you are lacking that sort of tonality and therefore the expectation that comes with atonal structure, and (b) because frankly, where we are now in 2012, there is no rule book. Everything is up for grabs for a composer. You can do whatever the hell you like. You know, to be honest, nothing is shocking anymore. I think composers are struggling to come up with new ideas. Anyway, I'm probably going into the need to compose area, which we will discuss later. I can't comment on Beethoven's perception of polyphony, sorry. [Laughter]

**PROF MICHAEL TRIMBLE:** Stephen, do you want to comment on Beethoven's perception of polyphony?

**STEPHEN JOHNSON:** Actually there's something else I would like to comment on first of all, with

all due respect, I don't think that Beethoven was being a wimp in the Heiligenstadt Testament at all. My wife deals with people therapeutically who have acquired brain injuries, and she often tells me that for many people the loss of a sense, or the loss of a faculty is as devastating as the loss of a close loved one. It is a fall of grief which many of these people experience and they have to be helped through that as much as they have to be trained to think and reason in a new way, and I can certainly sense from the Heiligenstadt Testament that Beethoven is confronting an issue just like that, without the kind of people like Kate to help him through it. Just the simple fact of becoming increasingly isolated from people, which he mentioned, is something which suggests that maybe in some ways it's harder to lose the sense of hearing, and particularly to lose it after some adult experience of it, than maybe it is to be born deaf. Maybe Paul has an advantage here, I don't know.

The other thing, as you yourself will be discussing, Michael, tomorrow, and I'm really looking forward to this, there's a strong possibility that Beethoven had some kind of depressive temperament and whether the question is of what was worse to Beethoven, was it the loss of hearing or the way that he as a potentially depressive individual would struggle to make sense of that, particularly at certain periods in his life, in which case I think the kind of "get over it, pull yourself together attitude" is a bit on the crass side actually.

**PROF MICHAEL TRIMBLE:** There's one more question here, and I promised you, then we are going to stop, but actually you are both coming up to the podium shortly afterwards and Nigel you will have your opportunity to carry on that banter after the tea; is that alright?

**NIGEL OSBORNE:** Yes, absolutely.

**PROF MICHAEL TRIMBLE:** Because you've got time to think about the response. There's one more question here.

**FROM THE FLOOR:** Hello, I've got two small things to say, they are very small and forgive me if they are banal. One is partly from a mother's perspective, which we have been discussing, and it's really about the fact that hearing - you know, it's constructed by the brain as well as by the ears. I am a mother, I love classical music and I come from a sort of family that loves classical music. I am frequently told by my son to close the door when I've got the radio on. He has struggled manfully for eight years to play the guitar. It means nothing to him. He cannot hear what I hear in the music at all. So it's not just a matter of the physiological, I mean it's obvious to all of you but maybe it needs saying that we construct what we hear, we all hear differently and nobody knows what someone else is hearing, and some people hear more intensely than others. That's all I wanted to say about that.

The other thing is a very small point about reading a score that hasn't been made and again is trivial perhaps, but obviously in Beethoven's day there were no radios, there were no CDs, people were not

used to hearing music as much as we are. There weren't very many orchestras, so people were much more accustomed to constructing music from reading it on the page. The famous story of Mendelssohn being given a score of the St Matthew Passion on his 14th birthday and hearing it, because he could open it and read it. Sorry, that's it, thank you.

**FROM THE FLOOR:** You have the famous example of Mozart going to the Vatican and hearing - I forget what it was called... Miserere - it was forbidden by a papal decree from being published anywhere on Earth. You would be excommunicated if it was published, and Mozart had the ability to go to the Vatican, he heard Miserere and he could remember it and that was probably because they didn't have radios and CDs, they probably just had to remember things. They had no means of recording it.

**PROF MICHAEL TRIMBLE:** Yes, well, I think that's quite interesting and I will just finish this by saying this raises the issue of people who actually are born congenitally without the ability to hear music. Amusia is a well-known neurological condition and I think it probably affects in a mild way quite a lot of people but in a severe way less than 1% of the population thank goodness, but there are people who do not understand or feel or get anything from music and they have been studied quite intensely. People who haven't been studied are the geniuses of music, and not the idiot savants, you know, we've all heard of people who have very low IQ, they are autistic but they can sit down at a piano and do whatever - but people like Mozart, like Beethoven, and other great composers, they had this wonderful ability to remember everything and this requires, from a neurological perspective - and I think we would learn a lot about the brain generally if we could study people like this, but of course they don't come forward because they are not considered as having "illnesses", but you do have an illness if you lose speech or whatever. But they are very, very important, interesting questions.

**DR PAUL WHITTAKER:** Michael, something that struck me in the past session this morning, deafness is not necessarily an illness to be cured. There are too many people who look on deafness as an illness to be cured. It's not.

**PROF MICHAEL TRIMBLE:** Yes, I think that's a lovely and important resonant note to finish on.