



8 OCTOBER 2018

No Listening, No Music: Why Listening Matters

PROFESSOR TOM SERVICE

A history of listening: as we embark on this series, it's worth asking: why? And, admittedly, how?, but let's deal with the why first! There are historical and musicological dimensions to this, as well as a set of scientific answers as to why a history of listening is, I believe, a necessary project, but there's a personal side to this story too.

Growing up knowing that I would never, alas, become a conductor like Simon Rattle - who may well inspire a new concert hall to be built on the footprint of the Museum of London, where we are right now, despite my truly excellent, world-class skills as an armchair conductor, classical music's equivalent of air guitar; or that my hacking through Mozart and Beethoven piano sonatas probably wouldn't get me to the concert platforms of Glasgow, London, or Vienna; or that my deliciously incompetent compositions would or should ever be seen by anyone outside of A-level examiners, I faced an existential choice about how to make a life in music.

Benjamin Britten spoke in 1964 about what he called the "holy triangle" of musical culture, of composing, performing, and listening. I didn't have professional access to the first two of those, but the last of them - listening - that was something I could do - and which we all do! And listening, and interpreting the world through listening is what I've been doing over the last 30 years or so. And much of that listening, for me, has happened in a classical music context. If the image of classical music performance you might have is of serried ranks of white-hairs and white-beards, giving themselves up to an evening of social betterment and non-challenging passive sensory deprivation, listening in somnolent silence while a penguin-suited ensemble on the concert stage plays centuries-old music - well, you might have a point. But only up to a point... I won't go in now to the centuries-old participative culture that is this particular kind of listening, and the remarkable cultural work that went in to its creation - that's our subject for the next talk! - but from a personal point of view, that passivity never been my experience of classical concert attendance - and I suspect, neither has it for any of you, in whatever context you first experienced it.

For me, that happened in the early 1980s in Glasgow: an all-Mozart concert with the Scottish Chamber Orchestra. I knew precisely nothing about the composer, or the rituals of the concert hall; had no idea what those musicians up there were doing in their black outfits, their instruments of wood and wire, of bow and string, let alone that person at the front, who made no noise at all, but wielded and waved a magician's wand in the air. And then this music started...

[CLIP 1 - Mozart 29, First Movement]

Mozart's A major symphony, K201, his 29th, composed in Salzburg in 1774, when he was 18 - all part of the trainspottery information I would soon start to devour, but none of that meant anything to me or mattered at the time. Because this music - deceptively simple, but miraculous in its economy, in the way it turns harmonic movement into melody, in the sensual fullness of the inner voices - seemed to take over my brain, imagination, and whole being.



I had no way of describing what happened back then, only that there seemed to be no distance between me and the music.

I didn't know then - I mean, I was 7! - that Tolstoy had summed up this sense of total musical immersion: "You are the music, while the music lasts". And in retrospect, something else was going on: it felt as if this music gave me knowledge of realms of feeling that I didn't previously know existed. In the way these profound musical experiences sound out new places in our souls, it's not only that we are listening to the music, we might feel that the music is listening to us...

We'll have more on that mysterious heightened consciousness of pieces of music later in this series. And I need to say that there's nothing privileged about Mozart in that example. The music I was experiencing happened to be by him, but whether it's Madonna or Miles Davis, that total identification with the music we love the most, whatever it is, is one of the deepest listening experiences we can have. These kinds of epiphanies are the exact opposite of the concept of listening as a passive, escapist pastime. Instead, they're explosions of feelings and ideas, of joys and criticisms. And that first listening epiphany set the template for what listening could do in my life. Listening disrupted and developed what I thought about music, and what I thought about the world and how I navigated a place within it.

So above all in this series of talks, I want to argue for listening as an active engagement with the world, as a fundamental musical and human activity that allows us to connect not just with music, but also with a larger cosmos of ideas, of stories, identities, and relationships. And I use 'listening' here in the widest sense - it's about experiencing through our ears, it's about feeling through our bodies, and attending to the unheard sounds that we imagine in our minds and our dreams. When we listen, as the composer and writer R Murray Schafer has put it so beautifully, what we're really experiencing is "touching at a distance". That's really true, as we'll discover: the physics of how we hear are incontrovertible: our bodies, the membranes of our inner ears, our brains, our nerve centres, our feelings are activated every time we hear any sound at all – even my voice right now... And that means, at the simplest yet most profound level, that listening is something that moves us - since that's what is really happening. Physically, neurologically, that is what's going on - we are being moved and changed by the music!

So today, in outlining why if there's no listening, there's no music, I'll explain why listening has been unheard for so long; we'll search for a definition of listening in the fundamentals of vibration perception; I'll argue that there is no difference between "hearing" and "listening" in the way we often use the terms; we'll hear Professor Steven Mithen tell us about our first musical listening as a modern human species in the Ice Age and earlier; and we'll bring listening out of the shadows and find it in the contemporary musical caves of our concert halls.

Listening Unheard

All of that anecdotal is to say: this is personal! But listening is also universal. It is listening - understood according to the definition I'll set out soon - which is the common denominator across all of humanity's musical cultures, without which composers and performers could not function. Western musical cultures make this especially clear, because there are exponentially more listeners than there are virtuoso singers or instrumentalists or professional composers. Yet it's a music-historical truism to say that listening has received scant attention, compared to composing and performing, in the way that music has been described and its story been told. To understand why that is, let's revisit Benjamin Britten's holy triangle of musical culture. If we turn those three ideas - composers, performers, listeners - into a hierarchy of Western musical historiography, the triangle is more like a pyramid. Composers are at the top - because they and their works have been the most written about and debated, and without them, Western music, especially the music we call classical, wouldn't exist. That stands to reason, doesn't it? They write the pieces, after all! Next, in the middle, are the performers whose duty is to pass on the thoughts of the composers through the transparent communication of their concerts; performers are mediums; their agency is defined by the notes the composers write and the contexts in which they perform. And down there at the bottom, to reflect how little they've



been written about, are we listeners: the recipients of this chain of musical communication, whose sole responsibility is to sit there and have the music done to them, we are the bums on seats, the ears who hear, nothing more, nothing less.

Well, what I want to do in these talks is to show that the reality of so many musical cultures is exactly the other way around. It isn't that we listeners are at the bottom of the pyramid but instead, performers and composers are a subset of that listening practice that binds musical culture together. The pyramid should look like this:



The pyramid of musical culture flipped, and inverted. As the ethnomusicologist John Blacking has said, in his book *How Musical is Man?*, in order to create the conditions for a Beethoven or a Bach - or a Stevie Wonder, an Aretha Franklin, an Ustad Amjad Ali Khan - you need, first of all, a community of listeners.

However: there are plenty of good reasons why listening and listeners have been poorly represented in the stories we tell about music. We know - or we think we know - what musical works are: they are libraries of scores, black and white notes on pages, they have beginnings and endings when they're played in concert halls, they are framed by bouts of applause, and they are dependable, repeatable, analysable. That's even more obviously the case for recordings, for songs and tracks and albums, in which musical time is frozen onto vinyl or digital files, and the focus of our study is tangibly there as an object, or it's intangibly yet nonetheless inconvertibly there on our screens.

But listening? It's simply harder to find! Mind you, it's hard enough for performing, because if we're looking for the sounds of music in the past, before the era of recording, there's a lot of imaginative work we have to do to reconstruct the horizons of musical expectation of historical eras whose sounds we can never hear. And if it takes detective work to imagine how composers as familiar as Bach, or Mozart or Beethoven might have sounded, it's yet another more vertiginous leap into a world of shadows to try and hear echoes of how this music was heard - to listen to listening.

Musicologists are now filling the gap: pioneers of approaches to writing about listening in recent years and decades include James H Johnson with his study of listening cultures in Paris, Susan Douglas on how radio changed the listening culture of America, Evan Eisenberg's work on recording, Nancy November's on the string quartet in Vienna, Laura Tunbridge's on the listening cultures of lieder performance, broadcasts and transmission between the wars. But there are echoes we can catch in previous musicological literature too: in the reception histories of musical works, in the expanded listening-as-interpretation that is offered by music analysis, and in the accounts of critics and diarists and audience members of the listening cultures of their time.

And yet, listening remains music history's dark matter: dark matter, the most dominant entity in the universe, physicists think, but yet it has never actually been discovered, explored or defined: listening, similarly, is the essential component of all musical cultures, yet it's the least investigated. And just as the search for dark matter will probably bear fruit through consequential effects on cosmic bodies rather than direct observation, we can find clues to the way we used to listen through its reflections in art-forms other than music: in literature and in the visual arts.

[CLIP 2 - SCHUBERT PIANO SONATA]



This famous picture of a Schubertiade - an evening in the composer Franz Schubert's company - was made in 1868, 40 years after Schubert's death, by Mortiz von Schwind. As a young man, Schwind was part of scenes like this when music would be made and his playing and singing - and the singing of his great friend, the baritone Johann Michael Vogl, who is sitting next to him - was attended to by the awed concentration of his closest friends. The women are all seated - apart from the lady in the painting, framed above the piano, alleged to be Schubert's unrequited love - one of them, anyway - Countess Karoline Esterhazy.

Schwind isn't lionising the great Schubert at the piano here, as you might expect. Instead, he's showing the power of Schubert's music through the listening reactions of his audience of friends and would-be-lovers. By the looks on their faces - serious, concentrated, reverential, joyful - Schubert is perhaps playing music like this D major piano sonata, music of profound but cheerful reverie. And his audience - like the two figures on the left, who just have to communicate their rapture at what they're hearing to one another - are sharing the communal making of this music. Schwind is surely idealising that time and place, 40 years on, because Schubert in the years before his death in 1828 at the age of just 31 was a troubling and troubled person to be around, prone to bouts of depression and anger as well as manic happiness; a victim of the syphilis that would kill him. He became a seer into the abyss in music like his final song-cycle, the Winter's Journey, Winterreise, music that sent a chill through these listeners when he played it for them at the end of his brutally short existence. There's not a trace of that in Schwind's depiction; one of the most tender portraits of listening in the 19th century.

Another kind of listening is recorded by EM Forster in his novel *Howard's End*, the scene at the Queen's Hall in London in the early years of the 20th century, when the party hears Beethoven's Fifth Symphony. Forster manages to cram in as many different kinds of listening as there are individuals in the scene, so that we have "Helen, who can see heroes and shipwrecks in the music's flood; or ... Margaret, who can only see the music; or ... Tibby, who is profoundly versed in counterpoint, and holds the full score open on his knee; or like their cousin, Fraulein Mosebach, who remembers all the time that Beethoven is echt Deutsch". Helen has the lion's share of the narrative, and it's her vivid imagination that carries the day in Forster's novel:

[CLIP 3 - BEETHOVEN 5th SYMPHONY, SECOND MOVEMENT]

"For the Andante had begun - very beautiful, but bearing a family likeness to all the other beautiful Andantes that Beethoven had written, and, to Helen's mind, rather disconnecting the heroes and shipwrecks of the first movement from the heroes and goblins of the third. She heard the tune through once, and then her attention wandered, and she gazed at the audience, or the organ, or the architecture. Much did she censure the attenuated Cupids who encircle the ceiling of the Queen's Hall, inclining each to each with rapid gesture, and clad in sallow pantaloons, on which the October sunlight struck. "How awful to marry a man like those Cupids!" thought Helen. Here Beethoven started decorating his tune, so she heard him through once more, and then she smiled at her Cousin Frieda. But Frieda, listening to Classical Music, [capital C, capital M!] could not respond. Herr Liesecke, too, looked as if wild horses could not make him inattentive; there were lines across his forehead, his lips were parted ... and he had laid a thick, white hand on either knee. And next to her was Aunt Juley, so British, and wanting to tap. How interesting that row of people was! What diverse influences had gone to the making!"

"So British - and wanting to tap", contrasting with Herr Liesecke's severity and self-sacrificing concentration... I'm British too, as a tapping listener! This is another very specific listening culture, mediated by social, political and romantic influences, and reflecting already the rise of "Classical Music" as an industry and idea at the start of the 20th century, and the development of listening as a site of supposed ethical betterment. In fact, as Forster shows, listening even in the constraints of the classical and its conventions is radically individual.

Forster and Schwind are two of the many writers and painters who captured redolent images and imagined fragments of a history of listening. Yet the vividness and fragmentary nature of their dramatised memories proves the point. If I'm right about the primacy of listening, the problem with telling its story is that the vast majority of our listening - to



music, to each other - is lost to the record. Again, if the sounds of music itself - before and after the advent of the recording age, the last 140 years or so - remain shadowily ephemeral, disappearing into the ether as soon as the music stops, then to go in search of listening is like looking for shadows of shadows - to seek out musical culture's elusive dark matter... And yet, by the end of this evening's talk, I want to have shown you how it might be possible, after all, to listen to listening.

Listening: Vibration

We'll get there! But as well as Beethoven, there's another elephant in the room (as well as the goblins, Forster's Helen also talks about the elephants in the third movement of the 5th Symphony). And that's our definition of listening. What is this listening we're talking about? It's something that's recognisable in the musical contexts I've outlined, but we need a more fundamental definition of this universal sense. Where might the story of listening, and listening to music, start in the story of humanity?

In fact, we need to go back further than that, because the roots of our listening are found in our earliest vertebrate ancestors in the evolutionary record that were capable of vibration sensitivity and my thanks to Seth Horowitz and his book *The Universal Sense: How Hearing Shapes the Mind* for much of the scientific side of what you're about to hear! 350 million years ago, in the primordial oceans, an early ancestor of today's sharks, called *Sibyrhynchus denisoni*, stalked the oceans that surrounded the supercontinent Pangea. It was one of the earliest vertebrates to have an inner ear.

Why is *Sibyrhynchus* so significant? Because as Seth Horowitz says, it had an "otolith organ that sensed the direction of gravity, [which] would also vibrate in responses to pressure changes in the water. In other words, the ear had come into existence, and living things began hearing". That meant that this early shark-precursor could navigate and hunt more efficiently, and like all early vertebrates with these hearing mechanisms, they were able to ascend the evolutionary tree more successfully than their non-hearing cousins.

But the crucial word in Seth Horowitz's sentence there is "vibrate". Because our hearing - using what Horowitz describes as our "fair-to-middlin" ears - he's thinking of the greater sensitivities of, say, bats at the higher frequency end of the spectrum, and elephants and whales at the lower end - is in reality an exquisitely sensitive system of "vibration detection". "What is detectable, what is discernible, and what is relevant are the bases for parsing out raw vibration into silence, signal, and noise", Horowitz says. That's what "hearing" is, and that's why it's a sense that encompasses much more than only our ears.

All human hearing is a spectrum of sensitivity that changes as we age so that there are higher frequencies we simply can't process when we're middle-aged and older. And all human ears are different, from those that don't process any sound at all, to those of young children that are the most sensitive and the most impressionable, all within a frequency range of roughly 20Hz to 20,000 Hz - soundwaves vibrating from 20 to 20,000 times a second. But our whole *bodies* are sensitive to vibration. There are plenty of sounds that we don't hear through our ears, but which we feel through our bodies. Take infra-sound, which is a region of soundwaves below 20Hz. These are sounds that we don't hear with our ears but which we surely sense. Infrasonic rumbles - like the famous ripple on the glass of water in Jurassic Park, remember?... - are vibrations that are felt in our stomachs, our bones, our muscles. Traffic noise, thunder, aviation, waterfalls, glaciers calving, the boom of waves crashing, our listening bodies are hearing and interpreting these infrasonic soundwaves all the time, even while our ears don't physically 'hear' them.

(If we can't hear these sounds with our ears, elephants can with theirs! - which is why pachyderms in zoos near motorways are under such stress, since they are being bombarded with these low frequencies, and can't communicate so efficiently with one another. Similar phenomena are true with the increasing traffic of international shipping lanes, meaning that millennia-old communication pathways, often over hundreds and thousands of kilometres underwater, are being compromised for the world's cetacean population, those other great low-frequency-bearers of the natural world, from blue whales to minke.)



Which is why our definition of 'listening' must include those who live with deafness, whose sensitivity to the interpretation of vibration is unimpaired, even though their hearing mechanisms may be. We human beings are vibration sensors! And when you consider that, as Seth Horowitz says, "anywhere there is energy, including the depths of intergalactic space, is a vibratory region", there's a strong argument to say that the visible universe is a cosmic work of sound-art. Everything in it is composed of the vibrations of quantum particles at frequencies above the dimensions of Planck time - the physicist Max Planck calculated the smallest possible unit of time to be 5.39×10^{-44} seconds - any shorter than that and time ceases to function, below the scale of a millionth of a trillionth of a trillionth of a second! The universe is a gigantic system of vibrations - it's made of music. That's exactly how the quantum physicist Michio Kaku describes it when he outlines 11-dimensional string theory, in his book *Parallel Worlds* so that God - or the concept of God - is a composer.

(And just to put the visible - potentially hearable - universe into perspective: "The range of measured vibration is immense. At the top of the spectrum is the insanely fast 9,192,631,770 cycles per second of an energized caesium-133 atom. Near if not at the bottom are the gravity-wave-induced pulses of the sound of black holes (a B flat 57 octaves below middle C, according to Andrew Fabian of the Institute of Astronomy in Cambridge)". I always knew B flat was important - maybe that's the secret of Bruckner's 5th Symphony - also in B flat.)

Hearing vs. Listening

So when we hear, when we listen, we are interpreting vibration. That's our fundamental contention, that's what it's all about. But that gives us another set of definitions to think about: the difference between "hearing" and "listening". In musical contexts - and in the rest of our lives - these two ideas are often used in distinction from one another, as if one, "hearing" were passive or automatic, as opposed to the activity and engagement suggested by "listening". "You're hearing my words, but you're not listening to what I'm saying!" etc... Hearing is supposed to be a mechanical function of sensory perception, whereas listening suggests attention, concentration, the application of the base sense towards a grander perceptual purpose: a conversation with a loved one, or the synaptic firings of memory and feeling that are triggered when you choose to put on your favourite song, or symphonic allegro.

But that suggests that there can be something 'neutral' about our hearing. Yet the story of the evolution of human hearing shows that's simply not the case.

Our hearing mechanisms consist of 20,000 cilia - hairs that resonate in sympathy with particular frequencies within the range we can process - in the reservoir of the cochlea, the bones of the middle ear, which are the smallest in the human body. They create a tripartite ensemble of malleus, incus, and stapes - we not only need an ear-drum, that sensitive membrane through which sound waves pass, but a hammer, anvil, and stirrup - and together they work in concert as the most sophisticated set of percussion instruments we know.

All of these bio-mechanics have evolved to be most sensitive in the frequency ranges that are most useful to us as a species. Our hearing is acutely tuned to allow us to register the tiniest variations of pitch, rhythm, tone-colour, in the ranges of human speech and vocal expression. If we rewind the historical record to the early-modern homo sapiens, around 100,000 years ago, our hearing needed to be most useful to us when we were registering the cries of infants, the screams of fear or delight from other members of our group. Our hearing mechanism is a record of our development as a species, as we carved out our space in the sonic biome of the earth, occupying a frequency range that other animals hadn't colonised so completely - our middle ground between the birds and the bats, the insects and the whales.

So at the most fundamental level, our evolution as a species has chosen for us what we can hear: we are not perceiving all of the vibrations of the world through our ears, only the frequencies most helpful to us. And there's more in the deep workings of this sense. Because once that vibrational information passes through our auditory systems it's processed by our brains. And in the stupefying sophistication of what our brains are doing with those soundwaves, it



becomes harder still to argue for a supposedly passive “hearing” as opposed to an active “listening”. Where there is vibration perception, there is interpretation, there is activity.

Seth Horowitz tells us about the workings of our hearing minds: “It is this faster than thought auditory speed” - we respond to changes in sound that occur in less than a millionth of a second - “with a wide range of tones and timbres that visual colour cannot hope to match and greater flexibility than the chemical sensitivities of taste and smell, that lets sound underlie and drive a fantastic range of subconscious elements in the living organism. Combined with wildly divergent ways of listening by different species and the increasingly complex ways of using information by living things, the presence of sound drives the evolution, development, and day-to-day function of the mind...”

And what goes for the deep origins of mind and hearing also works for debates around different species of listening to music. Or supposedly different species of listening: Eric Clarke’s work on the psychology of music perception attends to this question in his *Ways of Listening*: and among many other insights, he says that the idea of passive listening is “an illusion: there really is no such thing as passive listening or the “rapt contemplation” that is its more lofty expressive counterpart, but only different varieties of more or less concealed or sublimated active engagement”. All listening - all hearing - is active engagement.

Clarke has other conclusions about the way our musical minds engage with the sounds around us. Most models of perception suggest that our brains first process the physical properties of the sounds we hear: their frequencies, loudness, their tone colours. After we have digested all of that, there’s a higher level of perception, which is where our interpretations of meaning come in, along with concepts like what genre we’re hearing, and what it makes us feel. Clarke’s work blows that model out of the water. As he says, our experience suggests the situation is exactly the other way around, in which those supposedly high-level interpretations are the first things we feel: at its simplest, think of the sound of an infant crying.

When we hear that sound, we don’t firstly process it as a series of wave-forms, amplitudes, and sound-wave-intensities: no, we have an instinctive reaction to it - to act, to help, to locate the source of the distress. And when we encounter music we love or think we hate, we have a version of that same visceral reaction.

The science of evolution and music perception show that there’s no such thing as “listening” as opposed to “hearing”, because we are always engaged through our vibration-sensitive bodies to make judgements about what we are experiencing. Listening is hearing is listening!...

Our First Listening

So much for first principles! And here’s where we need to go back again to our evolutionary past. Because there is a difference between interpreting the roar of a predator or the screech of potential prey in our prehistoric communities and having an object of human sonic imagination to listen to as music. We have some tantalising evidence for when that might have started, when a musical culture might have first existed. It comes from caves like those of Geissenklösterle in South-West Germany. There are other sites in Slovenia, and later discoveries in China, but flutes made from the wing-bone of a vultures are among the earliest instruments ever discovered, dating to the Ice Age, around 40,000 years ago.

As well as the flutes, there is evidence from caves all over the world, from Mexico to Spain, that human-made sound was used to evoke a world beyond this one, a world of the ancestors, of spirits, of early religious and ritualistic practice. In prehistoric caves with paintings, the greatest concentration of mark-making is often found in places of greatest acoustic reverberation. These were special, privileged places because they were gateways to the spirit world, as the acoustic of the cave opened up to resonate in strange, uncanny ways. Patterns of wear, of use, observed on the walls of the caves at these special archaeoacoustic points suggest that the caves themselves were used as instruments. The walls, the stalactites and stalagmites were hit like percussion instruments, so that the whole cave was made to



reverberate as a gigantic lithophone. It's one of the earliest ways in which music was used as a bridge to the beyond, and that's a connection with the sacred that we'll explore later in this series.

But we're going to listen now to Professor Steven Mithen for more on what the status of musicality and of listening might have been in these earliest sound-transforming musical cultures - and how for all their temporal distance from our supposedly modern world, there is much we have in common with our earliest music-making ancestors.

Steve's work as archaeologist has taken him across the globe, in sites from Jordan to Islay on the west coast of Scotland. And Steve has also dared something that evolutionary scientists and thinkers from Jean-Jacques Rousseau to Charles Darwin began to sketch, yet which future generations largely neglected, and which only recent work by musicologists, neuroscientists, and music psychologists has attempted to address: a definition of the origins of music. His book, *The Singing Neanderthals*, is one of the most ambitious and audacious works of scientific and cultural imagination that I know. It actually lives up to its subtitle: *The Origins of Music, Language, Mind, and Body*. So as a definition of what constitutes listening, we need Steven's testimony, on music, language, and listening. What does Steven think that the origins of music have to tell us about the origins of listening? He starts with some good advice for all of us.

[STEVEN MITHEN CLIP 1: (2'21")

So what about those instruments? How does Steven Mithen think they functioned in society all those millennia ago? And what clues might they give us about the broader musical and listening cultures of early modern humans?...

[STEVEN MITHEN CLIP 2: (2'23")

Into the Shadows

My thanks to Professor Steven Mithen at the University of Reading. He has some more advice for us, from the end of *The Singing Neanderthals*: whenever we listen to music we should "think about how the genes you possess have passed down from generation to generation and provide an unbroken line to the earliest hominid ancestor that we share. That evolutionary inheritance is why you like music - whatever your particular taste" ... And: "Once you have listened, make your own music and liberate all of these hominids that still reside within you" ...

The evolutionary inheritance of listening to music - we are connected on a genetic bridge across the aeons through our listening. That's a beautiful thought! [you've got to search for the hominid inside yourself, as the song doesn't quite say!...]

Listening to listening: I described the project earlier as chasing shadows of shadows, but if Steven Mithen and Seth Horowitz are right, then there is concrete evidence of our history of listening. It's imprinted in the fabric and structure of our hearing mechanisms, in the architecture of our consciousness, in our genetic inheritance, in every dimension of our musical cultures. And it's not only that we can hear the effects of this deep history of listening - we *feel* it every moment of every day. After all, we talk about shut-eye, but there is no such thing as shut-ear. We never stop sensing those vibrations!

And there are other concrete places in which we listen to listening, which are also bridges to our deep past. I mean literally concrete, too. Not far away from where I'm talking to you is the Barbican Hall, that symphony in concrete that's one of London's busiest concert halls, and, as it happens, the home of the London Symphony Orchestra. And the way you get to this hall is by descending down into the ground, and when you're inside, you're swaddled by the concrete of its enclosed auditorium.



And from the earliest concert halls - the first ever built in Britain is the Holywell Music Room in Oxford, still going strong after 270 years - to the latest, and the plans for a new concert hall underneath my feet, there's a lot they have in common. They are all enclosed spaces dedicated to listening - caves for listening. Every concert hall, throughout the world, is nothing less and nothing more than an architectural and cultural echo of caves like Geissenklösterle, those first cradles and crucibles of musical listening.

And while our contemporary instruments in orchestras like the LSO might seem to have developed from pipes and flutes crafted from the bones of vultures and griffons, they haven't actually changed so very much. The flutes of the LSO are still pipes with fingerholes that are capable of natural-world mimicry and transcendence. Our violins are resonant chambers of wood; brass instruments are technologically advanced curls of metal to pressurise and amplify the player's breath, molluscal forms in metal that mirror on a grand scale the shape of our cochlea - think of the French horn. Even electronic amplification and synthesisers are really only highly developed systems of transforming the world around us into new possibilities of sonic imagination - an admittedly high-tech version of the same process of "cognitive fluidity" (that's another Steven Mithen term!) that allowed our ancestors to turn the walls of a cave into sound-makers and conjurors of uncanny spirits.

We go into the caves of these concert halls, like our predecessors in the caves of Europe, to encounter an echo of ourselves, to discover and extend our consciousness as the acoustic of these spaces takes our voices, our music, into other dimensions. We are listening to our listening, as echoes transform the space around us, and the sounds we make.

The cave, the concert hall, the creation of a transcendent space in which sound can take us over a bridge in time. Our listening has changed over the millennia - and yet it has remained constant. It has shaped our mind, as Seth Horowitz says, and it continues to do so.

And it really does: as the composer Pauline Oliveros says, our hearing is the first of our senses to develop in the womb, and the last to leave us when we die. It's no surprise that the Tibetan Book of the Dead is actually called in the original Sanskrit "The Great Liberation by Hearing in the Intermediate States".

Liberation by hearing, liberation by listening. Our lives begin and end in an echo of our listening which is all by way of an existential upbeat to the rest of our series; starting next time with that noisiest of all listening cultural histories to the music we call classical.



Bibliography:

Blacking, J., *How Musical is Man?* (Washington: University of Washington Press, 1974).

Clarke, E., *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (Oxford: Oxford University Press, 2005).

Douglas, S., *Listening In: Radio and the American Imagination* (Minneapolis: University of Minnesota Press, 2004).

Eisenberg, E., *The Recording Angel: Music, Records and Culture from Aristotle to Zappa* (New Haven: Yale University Press, 2005).

Handel, S., *Listening: An Introduction to the Perception of Auditory Events* (Cambridge, Mass.: MIT Press, 1993).

Horowitz, S., *The Universal Sense: How Hearing Shapes the Mind* (New York: Bloomsbury, 2013).

Johnson, J.H., *Listening in Paris: A Cultural History* (Berkeley: University of California Press, 1998).

Lawson, G., and Scarre, C, eds., *Archaeoaoustics* (McDonald Institute Monographs) (Cambridge: McDonald Institute for Archaeological Research, 2006).

Mithen, S., *The Singing Neanderthals: The Origins of Music, Language, Mind and Body* (London: Weidenfeld and Nicolson, 2005).

November, N., *Cultivating String Quartets in Beethoven's Vienna* (London: Boydell Press, 2017).

Tunbridge, L., *Singing in the Age of Anxiety: Lieder Performances in New York and London Between the World Wars* (Chicago: University of Chicago Press, 2018).

Discography/music played:

Mozart, Symphony no 29, first movement (Colin Davis, Sinfonia of London).

Beethoven, Symphony no 5, second movement (Emmanuel Krivine, Chambre Philharmonique).

Schubert, Piano Sonata in D major, D850, fourth movement (Martino Tirimo).

Anna Friederike Potengowski and Georg Wieland Wagner, *The Edge of Time: Palaeolithic Bone Flutes from France and Germany* (EMAP, vol. 4) (Delphian, 2017).