# Sonic Skills in the Staging of Music History

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## Behind the scenes

Watch a few of the dozens of television documentaries about famous pop music bands available online, especially those featuring your favorites from the 1960s, 1970s and 1980s, and you will come across a scene in a music recording studio. There are the music stars: plucking their guitars, touching the drums, fiddling around with cables, testing their microphones, turning the knobs of their amplifiers, trying out a tune here and there, or listening back to what they have just recorded, moving the slides of the mixing console. A voice over will explain how the musicians, in their studio, found their spark of inspiration, or quarreled with each other and their managers over the best intros, echoes, background voices or the songs most likely or not to end up on the hit lists of the day.

The documentaries usually account of the music, reception and at times complicated group biographies of the bands on display, but they often also show the musicians' sonic skills: their ability to create, record, edit, reproduce, store, retrieve, and listen to sound, and to tinker with the electronic instruments and devices that produce these sounds. Whether or not these sonic skills are commented upon by the talking heads in the documentary or remain hidden and implicit in background scenes contributes to the image of music and music's history staged in such documentaries. The level of attendance for sonic skills may for instance show or ignore which band members or their helpers had golden ears, a proper understanding of the technicalities of recording, or a feel for molding sound from voice or instrument onto the newest single or LP. Even more telling is whether these skills are explicitly acknowledged or not. The same is true, so is my claim in this chapter, for the staging of sonic skills in formats such as opera, film or television comedy – it co-constitutes music history, as the patterns in the staging intervene in the cultural definition, appropriation and valuation of, for example, music technologies, musical instruments and musical knowledge.

This is relevant for both the age of non-mechanical music and that of automated recording and electronic music, but this paper focuses on the second, staying close to the time period the notion of sonic skills was originally developed for. This chap-

ter will first explain how this concept had its origin in a research project on sound and listening in the sciences in the long twentieth century, and how it is similar to, but also departs from conventional conceptions of musical skills. It then suggests how the presentation of sonic skills on stage, and notably the extent to which such sonic skills are being 'blackboxed' – a characteristic verb from Science and Technology Studies (STS) that I will unpack below – is relevant for studying music history on stage. I will do so by discussing three examples: the staging of Thomas Alva Edison's 'tone tests' in a chamber opera by Nick Brooke, the representation of Leon Theremin's electronic musical instrument in a selection of fiction film fragments used in a documentary, and the rendering of popular music knowledge in an episode of the British 1980s television comedy series *Alas Smith and Jones*.

All three examples pertain to the cultural appropriation of mechanical and/or electronic musical instruments, but are distributed across three different formats: opera, movies, and television. This implies that I slightly widen the net of Anna Langenbruch's definition of historiographic music theater as "theater events that have music history as their theme".[1] All cases involve a form of music theater, but the genre of theater is embedded in and mediated through film and television in the second two of them.

My discussion of these examples can, of course, not lead to any definite conclusions about the performative contribution of sonic skills to music history on stage. Despite the distribution, the cases are just that: illustrations of analysis. But I hope to show what opening the black box of sonic skills on stage, or keeping it deliberately closed, can do to the image of music and its history. This chapter is thus also a plea for exploring the usefulness of accounts and concepts from Science and Technology Studies (STS) for *Musikgeschichte auf der Bühne*. I will end with suggestions for a more systematic analysis of sonic skills on stage, returning to the type of band biopics I just opened this chapter with, and opening the door to new ways of doing music history.

## Sonic Skills in the Sciences

A few years ago, my colleagues and I introduced the notion of 'sonic skills' in the fields of Sound Studies and STS to capture the embodied capacities scientists, engineers and physicians had developed or claimed to need when using sound as a means to acquire knowledge about the phenomena they studied.[2] Historians

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1    This book's introduction, p. 21.

2    Trevor Pinch and Karin Bijsterveld: "New Keys to the World of Sound", in: Trevor Pinch and Karin Bijsterveld (Eds.): *The Oxford Handbook of Sound Studies*, Oxford 2012, pp. 3-35; Alexandra Supper and Karin Bijsterveld: "Sounds Convincing. Modes of Listening and Sonic Skills in Knowledge Making", in: *Interdisciplinary Science Reviews* 40 (2015), no. 2, pp. 124-144; Karin Bij-

of science and STS scholars had long acknowledged that scientists attended and kept attending to their senses beyond vision when doing science: chemists trusted their olfactory sensations when being involved in their experiments and might taste the results, physicists listened to their machines and equipment to check whether everything was working properly, and physicians had a long diagnostic tradition of both palpating patients' bodies and listening with their stethoscopes.[3] Yet a range of shifts, most importantly the rise of the ideal of mechanical objectivity in the sciences in the nineteenth century, reaching its pulpit in the 1920s, made it less legitimate to trust on individual and embodied observations.[4] Increasingly, the registration of phenomena was delegated to mechanical instruments, many of which produced visual inscriptions as signs of the observed.

As listening in the sciences had not died out, we developed a collaborative project on Sonic Skills that sought out to understand, for the 1920s and after, for what purposes scientists, engineers and physicians had listened for knowledge, how they had listened, and under what conditions listening in the sciences had become contested again.[5] Our cases were listening in the field (notably by ornithologists), listening on the shop floor (in automotive construction and repair), listening in hospitals (in cardiology and teaching situations for instance), listening in laboratories (such as plasma and biotech labs), and listening in practices of sonification, the auditory display of data. The notion of sonic skills was meant to underline that drawing on sound in order to construct knowledge involved more than merely using one's ears, mediated or not by auditory instruments, but also making, recording, editing, storing and retrieving sound. Making sound in the process of doing science for instance occurred when ornithologists triggered birds to sing by replaying pre-recorded sounds of other birds of the same species, or when sonification specialists tweaked the sonic parameters of their auditory displays. With recording we did not only refer to phonographic recording, tape recording or subsequent forms of mechanical audio recording, but also to practices of capturing sound in non-automated ways such as through musical and graphic notations or verbal de-

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       sterveld: *Sonic Skills. Listening for Knowledge in Science, Medicine and Engineering (1920s-present)*, London 2019.

3     Lissa Roberts: "The Death of the Sensuous Chemist. The 'New' Chemistry and the Transformation of Sensuous Technology", in: *Studies in the History and Philosophy of Science* 26 (1995), no. 4, pp. 503-529; Cyrus Mody: "The Sounds of Science: Listening to Laboratory Practice", in: *Science, Technology & Human Values* 30 (2005), no. 2, pp. 175-198; Tom Rice: *Hearing and the Hospital. Sound, Listening, Knowledge and Experience*, Canon Pyon 2013.

4     Lorraine Daston and Peter Galison: "The Image of Objectivity", in: *Representations* 10 (1992), no. 40, pp. 81-128; Lorraine Daston and Peter Galison: *Objectivity*, New York 2007.

5     See the Sonic Skills Website: http://sonicskills.org, the Sonic Skills Virtual Exhibition: https://exhibition.sonicskills.org (both accessed on October 14, 2019), and Bijsterveld, *Sonic Skills*.

scriptions of sound. Editing, storing and retrieving sound, finally, was about the processes of making recorded sound accessible for analysis.

In order to be able to compare practices of listening in the sciences synchronically, my colleagues and I delineated a classification of listening modes.[6] This typology distinguishes between three purposes of listening – monitory, diagnostic, and exploratory – and three ways of listening: analytic, synthetic, and interactive, but it is good to bear in mind that we were talking about listening in the sciences, not about listening in general. While monitory listening refers to listening in order to find out *whether* something is wrong, diagnostic listening concerns listening to find out *what* exactly is the problem: recall what doctors commonly do when using their stethoscopes, or mechanics when attending to car sound in order to diagnose an engine defect. Exploratory listening, in contrast, is about listening without knowing what exactly to listen for. Sonification specialists often have such an 'open-ended' aim when they listen for the first time to data provided by domain scientists, such as those about pulsating cores of stars in astrophysics. Whereas monitory, diagnostic and exploratory listening is about *why* scientists listen, synthetic, analytic and interactive listening is about *how* they do so. Synthetic listening pertains to listening to the sounds audible as a whole, while analytic listening is about focusing on a particular sound within the whole of sounds. Ornithologists might do the first when in the field, but the second when slowing down the speed of their tape recordings to get into the specifics of a bird call. An example of interactive listening, then, would be the already mentioned use of such a tape recording to seduce other birds to respond, or a mechanic running the engine under several conditions to hear which sounds remain the same and which change.

We found examples of all possible combinations of the purposes and ways of listening in our case studies, as well as of scientists shifting from one mode to another, from monitory to diagnostic, for instance, or from synthetic to analytic and back again. Such a virtuosity in mode shifting has often been enabled by particular instruments of listening – such as in the case of ornithologists working with their tape recorders, or ornithologists working with parabolic microphones, which helped to direct the sounds of birds and create more detailed recordings of the bird sound proper.

But as musicologist Brian Kane argued in his excellent discussion of Jonathan Sterne's notion of 'audile technique',[7] which inspired our more expanded notion of sonic skills, one should distinguish between perceptual techniques, such as listening, and techniques of the body, such as walking or diving. While both types of techniques need to be trained and practiced, Kane also notes a significant difference between the two. This has to do with "the evidence used to determinate that

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6    Supper and Bijsterveld, "Sounds Convincing"; Bijsterveld, *Sonic Skills*.

7    Jonathan Sterne: *The Audible Past. Cultural Origins of Sound Reproduction*, Durham 2003.

a technique has been successfully acquired". While the level of success of incorporating techniques of the body is noticeable to others by observing bodies in action, there is no action to discern in case of listening. "Rather, evidence is available only through the transformation of perceptions into actions", into "traces subsequent to the perception in order to be evaluated".[8] This is also true for sonic skills in the sciences, in which the perceptual skills of listening by, for instance, medical students or automotive trainees have been checked in epistemic tests – albeit informal tests on the shop floor in case of the automotive trainees – that require the translation of skills into legible signs of those skills.[9] The novices' ability to recognize particular sounds, and relate them to certain problems to be solved or issues to be unraveled, is assumed to be disclosed by the results of those tests. As the examiner, however, never knows for sure whether a correct answer means that the pupil has acquired the proper perceptual techniques, these techniques – as Kane rightly notices – "solicit skepticism".[10] Indeed, much of the discussion on and contestation of sonic skills is exactly about developing, standardizing or rejecting conventions, such as graphic notation, for the transformation of the perceptual dimensions of sonic skills into something observable within a particular professional or scholarly culture.

When analyzing sonic skills in the staging of music history, the distinction between perceptual and body techniques has an additional relevance: perceptual techniques are more difficult to visualize in a theatrical setting than techniques of the body. Although Western culture has conventional body postures for attentive listening – a hand behind the ear, for instance, or the closing of the eyes when music is played – it would be hard to visually convey the difference between, say, synthetic or analytic listening on stage. In contrast, it is definitely possible to show the body skills of the protagonists, at least partially, and it is there that the notion of sonic skills in the sciences is relevant for analyzing music history on stage. Not only do some of these skills overlap with what we traditionally subsume under musical skills, such as the notation, vocalization and verbalization of sound, sonic skills also came to include a wider range of observable forms of technical literacy in the mechanical and electronic age of music. And within that age, it is telling which sonic skills are performed on stage and which are not.

In our history and sociology of science project, an important first step in researching to what extent sonic skills had been accepted as a legitimate means of

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8    Brian Kane: "In Search of Audile Technique", Keynote lecture at the Sound and Music in the Prism of Sound Studies Conference, Paris, EHESS/Columbia University, January 24-26, 2019, lecture audio available on https://soundcloud.com/user-897145586/brian-kane-yale-university (accessed on June 3, 2020). Brian Kane kindly provided me with the written version of his talk, for which I am very grateful. Perceptual and body techniques are discussed on p. 16.

9    This also holds for listening skills taught and tested in ear training exams in musicology.

10    Kane, "In Search of Audile Technique", p. 16.

acquiring knowledge, was unravelling which of these skills were traceable in both the practices and publications of scientists. In their publications, scientists, engineers and physicians were often open about the sonic skills used or needed in the early days of an instrument of listening – such as the phonograph or stethoscope – but transferred those skills to a tacit background with growing acceptance of the equipment. This was at times connected to a societally entrusted jurisdiction concerning professional expertise, such as in the case of doctors and German car mechanics. But skills could also be deliberately hidden from view to suggest that the instrument did the work without much intervention by individual scientists, thus abiding to the ideal of mechanical objectivity. Or, and this is relevant to music history on stage as well, opening and closing the 'black box' of sonic skills might intervene in acknowledging (or not acknowledging) the capacities of those involved in science, from instrument makers and lab technicians to PhD students and full professors.

Originally, scholars in STS started to talk about "opening the 'black box'" of science and technology to articulate that social constructivist approaches aimed at analyzing the dynamics between society and the *content* of science or technology, in contrast to earlier work in the sociology and philosophy of science that had solely focused on the social conditions and effects of science and technology, or its in- and output, without much attention for the practices within.[11] This approach resulted in new theories of science and technology development, showing how facts and artefacts *became* established, or blackboxed, over time.[12] At the same time, opening the black box acquired the connotation of making science and technology less grand and distanced from everyday understanding, thus questioning conventional hierarchies. Opening or closing the black box of sonic skills in music history on stage may have similar implications. So how have sonic skills figured in such forms of staging? Let me start with a practice in which hiding sonic skills on stage was key to the performance: the tone tests in the early days of the phonograph as a music device.

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11    Trevor Pinch and Wiebe Bijker: "The Social Construction of Facts and Artifacts. Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other", in: Wiebe Bijker, Thomas Hughes and Trevor Pinch (Eds.): *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*, Cambridge MA 1987, pp. 17-50, and see for a critical response Langdon Winner: "Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology", in: *Science, Technology, & Human Values* 18 (1993), no. 3, pp. 362-378.

12    Bruno Latour: *Science in Action. How to Follow Scientists and Engineers through Society*, Cambridge MA 1987.

## Tone Tests in a Chamber Opera: Mimicking Phonograph Sound

Tone tests, as explained by Emily Thompson in a 1995 article in *The Musical Quarterly* and Marsha Siefert in a *Science in Context* paper published in the same year, were events in the format of music recitals initiated and sponsored by Thomas A. Edison.[13] In these recitals, musicians, most often female singers, or singers accompanied by pianists, violinists or flutists, would be staged together with a phonograph and perform musical 're-creations' of famous classical music or folk music works. The singers would either perform solo, or in synch with the recording (often but not always a recording of their own voices), or the phonograph would play alone with the singer lip-synching. As the *New York Tribune* had it after a tone test at Carnegie Hall on April 28, 1916 "the fascination for the audience lay in guessing whether Mme. Rappold [the singer] or the phonograph was at work, or whether they were singing together."[14] Over time, this format developed into a strictly scripted event in which there would be a private living room on stage with the phonograph and the musicians performing. The event would always end with turning down the lights and the singer secretly moving behind the scene, leaving the audience to think they were still listening to the singer, only realizing that they were just listening to the phonograph after the lights had been turned on again.

There were thousands of tone tests organized between 1915 and 1925. It started after Edison had introduced his Diamond Disc Phonograph that replaced the cylinder phonograph recordings. As is well known, Edison initially didn't see the phonograph as a musical instrument, but as a device for spoken letters, talking advertisements, recorded telephone conversations, musical toys perhaps, and later as business machines. In practice, the phonograph increasingly came to be used for replaying music in hotels, saloons and at home, something Edison tapped into. But, as there was public discussion about whether playing music with a phonograph was to be regarded as "a marked deterioration in American music and musical taste",[15] threatening the heritage of Victorian values and virtues associated with amateur music making, or a wonderful chance for the masses to become familiar with a range of music, Edison invested deeply in re-marketing it as a musical instrument. It had to be showcased as an instrument capable of performing "the most highly

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13    Emily Thompson: "Machines, Music, and the Quest for Fidelity. Marketing the Edison Phonograph in America, 1877-1925", in: *The Musical Quarterly* 79 (1995), no. 1, pp. 131-171; Marsha Siefert: "Aesthetics, Technology, and the Capitalization of Culture. How the Talking Machine Became a Musical Instrument", in: *Science in Context* 8 (1995), no. 2, pp. 417-449.

14    "Edison Snares Soul of Music", in: *New York Tribune*, April 29, 1916, p. 3, cited in Thompson, "Machines, Music, and the Quest for Fidelity", p. 131.

15    John Philip Sousa: "The Menace of Mechanical Music", in: *Appleton's* 8 (September 1906), p. 278, cited in Thompson, "Machines, Music, and the Quest for Fidelity", p. 139.

regarded 'serious music' of the day".[16] The tone tests had to help him with just that: the idea was to underline that the Edison Diamond Disc Phonograph, its machinery concealed in a piece of wooden furniture, had no tone of its own, and that you would listen to 'the real thing': the sound of the singer or other musicians.

In practice, the singers were trained to adapt their voice to the sound of the phonograph (by singing in half-voice or without vibrato where necessary), to mimic its pitch and tempo, and do lip-synchronization to make it more difficult to sense the difference between them and the recording. But it is also good to note, as Emily Thompson does, that the Diamond Disc Phonograph *was* acoustically more advanced than earlier recorders. This did not mean, as she has shown, that members of the audience did always take the comparison at face value. Moreover, they often enjoyed the musicians more than the phonograph recordings, even though press clippings of the events nearly always stressed that the audience couldn't hear the difference between singer and phonograph recording. Everything taken together, tone tests "equated listening to records with listening to musical instruments and to live vocal performances. This equation has become commonplace".[17] And while doing so, I would like to add, the tone tests *cum* recordings also contributed to the canonization of famous classical music works.

In the early years of the twenty-first century, the composer and later Princeton PhD graduate Nick Brooke drew on Emily Thompson's article as a source of inspiration for his Tone Test chamber opera.[18] The work, for which Brooke wrote both the libretto and the music, had its premiere in 2004 as part of the Lincoln Center Festival in New York City, and drew on spoken text, song and life sound mixing along with reworked phonograph samples.[19] Brooke and director David Herskovits thus staged the history of tone tests, a significant phase in the history of recorded music, as a work of art. There is hardly a higher honor imaginable than having one's academic article reworked into an opera. It was no coincidence, however, that it was Brooke who felt inspired by Thompson's narrative. As was noticed in a *New York Times* preview, he had been intrigued by "lip-synching, karaoke and tribute bands" for years, not only considering these practices typical for but also taking

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16    Siefert, "Aesthetics, Technology, and the Capitalization of Culture", p. 433.

17    Thompson, "Machines, Music, and the Quest for Fidelity", p. 160.

18    See Emily Thompson's Princeton University's website https://history.princeton.edu/people/emily-thompson. See also personal communication with Nick Brooke, via email, March 7, 2020.

19    Bruce Hodges: "Lincoln Center Festival 2004, *Tone Test (world premiere)*, Clark Studio Theater, New York City, July 23, 2004", in: Seen and Heard International Concert Review, http://www.musicweb-international.com/SandH/2004/May-Aug04/Lincoln237.htm (accessed on October 16, 2019).

them serious as modern day ways of musical expression.[20] In his view, so he clar-ified in an interview, buying a CD from a famous artist is often about wanting "to be that CD". And reusing that music is not just appropriating musical style, but re-appropriating the manner "a domestic listener sitting in a recliner would sing and ultimately scream that tune at home in ways that run counter to the tune". And while he had always notated the music by other composers and cultures again and again to really understand it, he hoped that his audiences would "get" music and culture, "finally hear it, all the pins and wires" (as one of his friends had said it) by the way he had "rearranged, chopped up, fragmented, and essentially put it together in a new order".[21]

In Brooke's chamber opera, Metropolitan star Anna Case (1887-1984) – one of the historical tone tests singers – does her very last tone test, and while doing this explains and expresses what she was normally supposed to do, thus unveiling the secrets behind the tone tests. On stage, she is accompanied by Bob, who is recall-ing how in 1981, he got his father's 1917 phonograph. He shares with the audience how he listened to it, and fell in love with the Anna Case on the recordings, which was perhaps also what happened to his father – Bob's parents got divorced. In a subsequent scene, Anna Case and Bob dance together, as in a *rendez-vous* across time frames. But Anna underlines that she is not real, and much of the opera is about either pretending or finding one's own, authentic voice. The opening scene already articulates this theme by playing Brooke's 're-creation' of a historical Edi-son phonograph introducing itself, combined with Brooke's composed sounds and Anna's voice.[22]

So, while the Edison company trained its singers to use secret sonic as well as conventional musical skills to have the tone tests succeed, and designed the Dia-mond Disc phonograph in such a way that it 'blackboxed' the machine, Thompson and Brooke both open up at least part of the 'blackboxed' sonic skills again to their readers and audiences. But in doing that effectively, Brooke had to train his singers in doing exactly what Anna Case and her colleagues had been doing: singing in synch with the phonograph, for instance, or a quarter tone out of tune because the phonograph was off-pitch.

That happened to be far from easy, and required specific types of notation in his opera score in addition to conventional notation, especially to help the singers

20    Thomas Staudter: "Old Recordings Make a New Mix", in: *The New York Times*, September 8, 2002, Section NJ, p. 14.

21    Molly Sheridan: "Nick Brooke. The Artful Appropriator", Transcribed and edited interview, October 15, 2004, New York, NY, in: *NewMusicBox*, https://nmbx.newmusicusa.org/the-artful-appropriator-meet-nick-brooke (accessed on October 16, 2019).

22    Nick Brooke: *Tone Test*, Chamber Opera, 2004, http://nbrooke.com/2009/07/tone-test/, audio clip available on: http://nbrooke.com/media/I_Am_The_Edison_Phonograph.mp3 (accessed on September 6, 2019).

to synchronize their singing with the phonograph or to deliberately deviate from it where the narration asked for it. For instance, Brooke used unmetered notation with romantic tempo indications, exact time measurements in seconds, and notations in which the notes have less or more space in between them depending on how fast or slow the singing has to be, as the excerpts of the score show (see fig. 1).[23]

But more importantly for the argument developed in this chapter: Brooke had to 're-blackbox' the sonic skills of performing tone tests on stage in order to open them. He had carefully instructed the singers to read his new forms of notation that had to capture the synchronization of voice and phonograph sound. Ironically, he had to create new tricks of the trade to disclose the sonic skills behind Edison's tone tests in his music theater, and to have his audiences 'get' the bygone dawn of a new intimate relationship with recordings by experiencing it in a rearranged way in the present.

*Fig. 1: Score fragments of chamber opera Tone Test, Nick Brooke, 2004 (Courtesy Nick Brooke)*



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23   Because I could not find substantial recordings or footage of the Tone Test opera, I contacted composer Nick Brooke. He was so kind to send me audio recordings, photos and, in fact, the score. This is then the first publication of samples of the *Tone Test* opera score.

## Theremin on Film: Easy Playing

There is way more to say about Brooke's chamber opera, but for the purpose of comparing sonic skills in the staging of music history, I would like to proceed with my second example: the Theremin, and notably a documentary about this electronic instrument: *Theremin: An Electronic Odyssey* by Steven M. Martin (1993).[24] But in order to account of the Theremin as a musical instrument properly, I first have to introduce the man behind it in some detail: Leon Theremin (born Lev Sergeevič Termen). For this, I draw on another seminal study: Albert Glinsky's *Theremin: Ether Music and Espionage* (2000).[25]

Léon Theremin (1896-1993) was a Russian physicist who hesitated for some time between pursuing a career as a cellist or a scientist. He started with following both conservatory and physics training, but acquired his first professional expertise in radio technology, and then started working for the Physico-Technical Institute in Petrograd (St. Petersburg). There, he gradually developed an electronic musical instrument that was later to receive the name of its inventor: initially 'Termenvox', then Theremin.

The instrument drew on the ability of the human body "to store up charges", or its capacitance. In this phenomenon, "a person's natural body capacitance, when standing near an electrical circuit, could interfere with the capacity of the circuit, cause a change in its parameters, and set off a signaling device".[26] Theremin transformed this device into an alarm by adding an amplifying vacuum tube to the circuit "as a radio transmitter to generate waves of a specific high frequency, directing them to an antenna".[27] Someone approaching the antenna would alter the circuit, and then trigger an alarm. Theremin did not stop here, however, but went on to rebuild his 'radio watchman' into an 'etherophone' that used an additional principle: heterodyning, in which a circuit mixes two frequencies which then result in another frequency, the beat frequency or difference tone. This enables one to turn two different super high frequencies into frequencies in the audible range. In the etherophone, these two high frequencies were the frequencies of a fixed oscillator – an oscillator being an electric circuit that produces a periodic oscillating electronic signal – and a variable oscillator. Moving one's hand to the antenna of the etherophone would affect the frequency of the variable oscillator, leading, via heterodyning, to an audible tone.

By the time the instrument was patented and presented to wider audiences in the early 1920s, the instruments had two antennas. Bringing the performer's right

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24    Steven M. Martin: *Theremin. An Electronic Odyssey*, UK 1993 (Film Documentary).
25    Albert Glinksy: *Theremin: Ether Music and Espionage*, Urbana and Chicago 2000.
26    Ibid., p. 23.
27    Ibid.

hand to a vertical, upright antenna created an increasingly higher siren-like pitch, while the left hand controlled the sound's volume through another, horizontal and loop-shaped antenna. Because the performer did not physically touch the device while playing, although there *was* contact with the circuits through body capacitance, it often created the illusion of magic to the audience of its time.[28]

Theremin himself always promoted the monophonic instrument as easy to play, as an instrument that could be intuitively handled. It would not only enable the player to create novel microsounds, but also immediately express one's musicality. He felt that the cello had always limited his musical expression, he had been impatient with it: "I realized there was a gap between music itself and its mechanical production, and I wanted to unite both of them".[29] In one of Theremin's own stories, he had demonstrated the instrument to Vladimir Ilyich Lenin, who was able to play it within minutes after Theremin had taken Lenin's hands and played it together with him – perhaps as much a token of public Lenin adoration and socialist 'marketing' strategies as of the playability of the Theremin.

This message of intuitive playing was also key to the advertisements accompanying Theremin's extensive tours along European music halls in the 1920s, followed by a tour in the United States in 1927, playing both melodies from the classical music repertoire and popular tunes. "If a youth has the spirit of music in him", Theremin had it in that year, "he can play with my instrument, in a fortnight, what a violinist can play only after two years' training".[30] With RCA, the Radio Corporation of America, he developed the Theremin into an instrument that "anyone could play", be it a skilled musician, a blind person, a child or an "elderly lady".[31] It was like humming, singing or whistling, something quite natural to do, without requiring musical knowledge or extended practice. The general press largely followed this narrative, and some press reports even claimed that you just had to wave your hands, and then the instrument would play anything you liked.[32]

In practice, however, the instrument did not become as common as Theremin had hoped for. The theater version of the instrument had a loudspeaker, which could produce horribly loud shrieks if something went wrong. The home version was launched at the end of September 1929, so unluckily just prior to the start of the Depression. It was relatively expensive, often defective and hard to repair for

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28    Ibid., see also Thomas Patteson: *Instruments for New Music. Sound, Technology, and Modernism*, Oakland, CA 2016, Open access: https://doi.org/10.1525/luminos.7 , p. 66.

29    Leon Theremin: "Rozhdenie, detstvo i younost 'termenvoxa'", in: *Radiotekhnika* 27 (1972), no. 9, p. 109, cited in Glinksy, Theremin, p. 11.

30    "Electricity Turned into Music", in: *Daily Chronicle* (London), December 10, 1927, cited in Glinksy, *Theremin*, p. 63.

31    Sales brochure RCA Theremin 1929, and advertisement brochure, [n. d.], reproduced/cited in Glinsky, *Theremin*, p. 203, and p. 105 respectively.

32    Glinsky, *Theremin*, pp. 101-102, for similar press responses see also Patteson, *Instruments*, p. 68.

most music dealers. The instrument manual, as Glinsky shows, gave little guidance either, even though the instrument had to be calibrated to the size and stature of its player. He or she had to move the hands in free space, with nothing to take a hold on, but there were hardly any courses on offer to get used to that. RCA managers asked for improvements such as making the control more conventional – hand up, pitch up, or similar to the piano: hand to the right, pitch up – adding a scale, or allowing for finger playing instead of hand waving, but this did not materialize. And in the meantime, to make things worse, a competing electronic instrument entered the market: the Ondes Martenot, which had a dummy keyboard and articulation button.

The Russians did not send Theremin to the United States only for pitching the musical instrument, however. It is very likely that Theremin had a task to spy on technological and industrial developments in the United States.[33] In 1938, however, he decided to return – his only temporary residency permit and financial problems contributing to the reasons – and was secretly brought home again by the Soviets.[34] He worked, or had to work, on military projects until he retired. After the fall of the Berlin wall, his story was rediscovered, and for the documentary, he was reunited with a famous player of the Theremin: Clara Rockmore, a former violinist, who had also contributed to making the instrument more sophisticated, as she recounts in Steven M. Martin's documentary.

The documentary also includes quite some examples from American films in which the Theremin is either audible or visible. The sound of the Theremin was nearly always used to create an eerie, mysterious, otherworldly, or futuristic atmosphere, most often in horror or science fiction movies, such as in a film clip that features a vampire approaching a woman. In terms of sound, it thus only partially followed Theremin's own representation, seeing his instrument as an improved version of a classical musical instrument.

In other ways, however, the staging of the Theremin as musical instrument *did* follow Leon Theremin's ideas. In one embedded film fragment, taken from *The delicate delinquent* (1957, Jerry Lewis), a young man is falsely accused of a criminal offence, gets the chance to be re-educated, and eventually develops into a policeman. In one of the film scenes, the young man passes through a hallway when he notices a faint and mysterious sound. He enters a room cluttered with technical devices and a Theremin standing against one of the walls. As soon as the boy approaches the instrument, it makes the sound again, a howling sound going up and down, now much louder. Initially, the young man dashes back upon hearing it, seemingly scared, but his curiosity appears to be bigger than his fear, as he soon starts fiddling with the instrument. After just a few short notes that he comically triggers

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33    Glinsky, *Theremin*, p. 48, 76.
34    Ibid., pp. 183-193.

and breaks off again by leaning into and stepping back from the instrument, he is able to fully control and play the instrument. Soon after, however, and all of a sudden, the instrument starts playing in entirely automatic fashion, producing a song the guy obviously loves. It makes him dance in front of the instrument, until his educator enters the room, annoyed by the airheaded activities of his pupil.[35]

In this example, two things are 'blackboxed': the technicalities of the instrument, and the sonic skills one needs to make the instrument working – carefully listening to its sounds, calibrating it to one's body, identifying problems and solving these by tinkering, and acquiring the tuning, physical and musical skills in order to convincingly play the instrument. In the film, the instrument appears to be self-explanatory, even capable of automatically and empathetically acting itself, just like some press contributions had it in the early days of the instrument. In contrast, as we have seen, playing the instrument in everyday life required a range of sonic skills, as the documentary shows as well. It is no coincidence that both Theremin and Rockmore were string players, already familiar with searching for the right pitch with their hands. They started from and further developed the required skills, variably drawing on technical literacy as well.

It would not suffice, however, to attribute the staging and restaging of the trope of effortless playing a musical instrument to Theremin's sales strategies only. The trope has been too persistent in the history of mechanical and electronic musical instruments – it kept popping up.[36] That was, I would like to suggest, because it rang a bell in popular imagination, and functioned and still functions to stimulate people to start and get hooked to playing before they realize the skills necessary are still substantial. And it serves an eternal dream: "Would I start playing, I could do it as well, I can be as good, musical, creative and famous as the virtuoso on stage, if only I would pick up the instrument one day." Which brings me to my last example.

## Smith and Jones Discuss the Beatles: Talking about Music

*Alas Smith and Jones* was a popular comedy show on British television, broadcasted between 1982 and 1987, and featuring comedian Melvin Smith and comedian-actor-television presenter Griff Rhys Jones as its two stars. The show's title did not only refer to the names of the two hosts, but also to another highly popular television program: the American Western series *Alias Smith and Jones* aired in the 1970s and

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35    Steven M. Martin: *Theremin. An Electronic Odyssey*, UK 1993 (Film Documentary), at 35:31-37:24 (of video-recorded version).

36    Trevor Pinch and Karin Bijsterveld: "'Should one applaud?' Breaches and Boundaries in the Reception of New Technology in Music", in: *Technology and Culture* 44 (2003), no. 3, pp. 536-559; see also: Patteson, *Instruments*.

beyond. But whereas *Alias Smith and Jones* was mainstream fiction, *Alas Smith and Jones* expressed and contributed to the 1980s counterculture.

In one of the comedians' famous sketches – *Smith and Jones Discuss the Beatles* – the two men are sitting opposite to each other, in what appears to be a pub.[37] We do not see the pints of beer, but we almost smell them. Smith starts bragging about the sixties, "those were the days", when London and America had exciting youth culture scenes, music was way better than today and he was "very much into hippy culture". At one point he tries to recall the name of "that famous rock star who choked to death in his own vomit", to which Jones responds by suggesting a long list of potential pop stars. By doing so, the sketch ironically suggests that most of these musicians led wild lives ending in tragic deaths. But it also shows that Jones is able to mention more names, and thus has a wider knowledge of pop music than bragger Smith.

This is underlined in the subsequent scene. After Smith has finally remembered that the rock star's name he is after is Jimi Hendrix, Jones shifts repertoire by mimicking Hendrix' characteristic guitar sound with his voice. Jimi Hendrix, as Rebecca McSwain (2002) has narrated, famously transformed a backlash in electric guitar building into a sonic innovation: He purposely employed the distortion that officially had to be prevented, and redressed the resulting sounds into a new conception and materialization of timbre, a widely copied sound.[38] Smith, however, is convinced it sounded differently, and plays air guitar while creating a rhythmic rock sound. Jones corrects him immediately: "No, no, stupid, that's Jimmy Page!", and then vocally emulates another highly convincing version of a Jimi Hendrix guitar solo.[39] The sketch does not end at this point, but the scene has been set. By being able to quickly sum up pop stars and to musically recreate a typical Jimi Hendrix sound, Jones is 'revealed' as the genuine expert in this case, intimately familiar with the sound of the past.

In contrast to the tone test and Theremin examples, there is no 'blackboxing' of the skills involved in creating a convincing sound in *Alas Smith and Jones*. On the contrary, the sketch deliberately exposes Smith's lack of knowledge, the ironic 'punishment' for pretending to know what he is talking about when bringing back the musical sixties. It is Jones who shows what it is to have deep knowledge of music history – being able to literally voice the sounds of music history.

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37    [Melvin Smith and Griff Rhys Jones]: "Smith and Jones Discuss the Beatles", in: *Alas Smith and Jones* (television comedy series), BBC 1984-1988, available at https://www.youtube.com/watch?v=Ok_42shL_5E (accessed on June 4, 2020).

38    Rebecca McSwain: "Reversing the Reverse Salient in Electric Guitar Technology: Noise, Humbuckers and Jimi Hendrix", in: Hans-Joachim Braun (Ed.): *'I Sing the Body Electric'. Music and Technology in the 20th Century*, Baltimore 2002, pp. 198-210.

39    "Smith and Jones Discuss the Beatles", https://www.youtube.com/watch?v=Ok_42shL_5E, at 2:23-3:17 (accessed on June 4, 2020).

## Conclusions

By expressing knowledge of the history of popular music through the embodiment of past music itself, the protagonist Smith also articulates an alternative conception of what music history could be, exactly in the way Anna Langenbruch addresses it in the opening chapter of this volume and in her earlier work. It is music history "going beyond rather than against the linguistic turn",[40] expressing its plot verbally, visually and musically, and in this particular case, in both embodied and normative ways: that knowing music history is impossible without a developed ear, without a musical memory storing a repository of sounds ready for retrieval, without a trained and abiding voice. On top of that the sketch expresses that knowledgeability can be disclosed by unpacking the sonic skills serving as indicators of a 'proper' understanding of music's history.

Sonic skills can also be hidden from view, however, and such acts of not-staging skills in music theater productions or in other media are similarly telling. In film fragments featuring the Theremin, the electronic instrument's sound underlined its weightless presence, its eeriness and airiness, while its visual staging expressed its quality as an instrument anyone could play after some initial wonder. It was paradoxically presented as an instrument without technicalities attached, without asking for skills in making it sound and keeping it going. How much skills it takes, ironically, to hide sonic skills from view became palpable in both the academic narratives and the opera staging of Edison's tone tests, as well as in the opera's score. It was there that 'blackboxing' sonic skills was at the heart of the matter. Once a mass phenomenon and then forgotten, the tone tests have returned in the history of music, in written and music-theatrical form, the second making the highly skilled dimension of doing tone tests literally 'sensible'.

Thus, if someone were to systematically unravel to what extent sonic skills in music history have been foregrounded or rendered inaudible and invisible, for example by analyzing how the sonic skills of modern studio work are depicted in the band biopics I mentioned in my introduction, it would likely show the changes in what has been considered significant to musical creation in different times, places, or media, and thus flesh out another version of music history, like what it was and is to be a musician.

But focusing on sonic skills in the staging of music history can also hint at how the way we conceptualize and present history can be enriched. In the Theremin documentary, the film fragments that celebrate the Theremin's otherworldliness

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40    Anna Langenbruch: "Klang als Geschichtsmedium. Einleitung", in: Anna Langenbruch (Ed.): *Klang als Geschichtsmedium. Perspektiven für eine auditive Geschichtsschreibung*, Bielefeld 2019, pp. 7–18, here p. 9.

and ease of playing can be read as a *contrapuntal* history to the documentary's message that skills were necessary after all, combining history and contrapuntal history in a mixed media format. The Smith and Jones-scene develops from a conception of music history based on *having witnessed* music and its wider scene (being "very much into hippy culture") via *namedropping* into presenting history by *being able to emulate the right sound* for the right artist. It articulates the value of knowing by impersonated sounding. In Nick Brooke's opera, the singers' mastery of and comments on the sonic skills of singing along with the phonograph help to disclose the work that was historically invested in creating successful tone tests. It is an artistic version of *reverse engineering* the history of music. It is a version though that does not so much take the legible score apart, as music theory would do, but tries to connect with the ways in which listeners fall in love with a recording or try to 'be' their CDs by *singing along* – in tune or not. It shows the history of music as the history of the embodied dreams and aspirations of its audiences as much as of its makers.

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