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GUEST EDITORIAL

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Introduction: music boxes and sonic skills

Since 2011, an artist collective called New Orleans Airlift has been building “music boxes” that transform architectural structures and salvaged materials into artistic installations. One such music box – dubbed the Shantytown Sound Laboratory – was built from the remains of a 250-year-old Creole cottage that had collapsed on the site of the future installation after the passing of Hurricane Katrina. The collective used its materials to erect several new structures, while developing and incorporating new experimental musical instruments into its walls, ceilings and floors. In rehearsals, jam sessions and community workshops, the collective and the community experiment with the acoustical properties of these instruments and their environment, sounding out the relationships between music, sound and material culture. Part performance, part experimental installation and part educational site, the music boxes are fluid objects that generate examination of their acoustic, material and cultural contexts. As sound laboratories engaging the practical and experimental skills of carpenters, music technologists, blacksmiths, architects, musicians, sound artists and “wing nut tinkerers” (Pett 2015), they may also provoke a technical and aesthetic investigation into the nature of sound, raise questions of what it means to play a musical instrument, or use the resulting sounds to scrutinise the politics that gives shape to local environments.

The aim of this special issue is to investigate how material objects prompt new ways of listening. The contributors examine a set of concrete artefacts, digital data, musical technologies and built environments that users have made or repurposed to attune themselves in different ways to their senses, acoustic environments and theories of listening. Borrowing the title of the New Orleans installations, we may conceive of these objects as “music boxes” that enable acoustic, material and cultural contexts to be sounded out. With the collection, we wish to explore the entanglement of theories, practices and materialities of sound. In the course of that exploration, we address such questions as: What kind of knowledge can be gained from listening with and to material objects or environments? How do those involved in such practices engage their ears to listen? How are concrete practices of listening related to theories about sound, musicality and knowledge, and how are they embedded in specific local and material cultures?

The articles collected here all investigate such practices in a wide range of cultural and material contexts – both historical and contemporary. Their authors come from a variety of disciplinary backgrounds, including musicology, history, anthropology, sociology and philosophy. Yet they share a certain affinity for science and technology studies (STS), and thus for the objects, tools and instruments that are used to produce and hear sound. The metaphor of the music box may therefore also be read as playing on that other box metaphor, so deeply entwined with the emergence of STS: the “black box”. Once “closed”, in classic STS parlance, black boxes allow us to forget the complex interactions between actors, objects and technologies that they presuppose (Latour 1987; Pinch and Bijker 1987). Opening these boxes, then, our authors show how knowledge through sound is always in the making, resonating between listeners, material artefacts and cultural contexts.

By examining such issues, these papers contribute to a growing body of work that, in the past decade, has begun to look at the knowledge-producing practices associated with specific arrangements of the senses, notably listening (Burri, Schubert, and Strübing 2011; Maslen 2015; Mody 2005). A number of scholars in this tradition have theorised listening within its material contexts. Emily Thompson (2002), for example, has charted the role of technology in the emergence of a new, modern experience of the acoustic environment. Jonathan Sterne's work (2003, 2012) likewise traces the perceptual technics through which sound technologies organise what and how we hear. Stefan Helmreich (2007) has situated listeners as immersed in technological and cultural media, and Tom Rice (2013) has tuned in to the tapestry of bodily and machine-made sounds that make up the acoustic environment of the contemporary hospital. Other work has highlighted the plethora of scientific tools and musical instruments (often both at once) through which knowledge of sound and listening has historically been manifested (Hui 2013; Hui, Kursell, and Jackson 2013; Jackson 2006; Kursell 2008), as well as the specific and often quite specialised tacit knowledge and sonic skills that they require (Burri, Schubert, and Strübing 2011; Mody 2005; Pinch and Bijsterveld 2012b).

In conjunction with this work, a research program funded by the Netherlands Organisation for Scientific Research (NWO) and coordinated by Karin Bijsterveld examined a diversity of listening arrangements in professional practices related to science, engineering, and medicine under the rubric of "sonic skills". The notion of sonic skills (Bijsterveld 2009; Pinch and Bijsterveld 2012a; Supper and Bijsterveld 2015) stresses the entwinement of listening skill (and the ability to engage in different modes of listening) with concrete practical skills in the making, recording, storing and retrieving of sound in such contexts as hospital wards (Harris and Van Drie 2015), conference halls (Supper 2015), shop floors (Krebs 2014), field sites (Bruyninckx 2012) and laboratories. The papers in this special issue both draw on and extend this work. Most of them were invited as part of a public symposium organised within the NWO Sonic Skills program, and all expose the material and embodied situatedness of practices and theories of listening. But they also cast the net a little wider, discussing the skilled listening practices of musicians, artisans or even prisoners.

Tom Rice, for instance, takes us through the soundscapes of the literally closed carceral environments at the end of the twentieth century to show that the listening skills and acoustical agency of prisoners are integral to understanding the experience of imprisonment. Peter Peters and Darryl Cressman analyse an effort to construct a fifteenth-century Dutch organ in the twenty-first century, reflecting on the insights into historical musical cultures that such replicas of material objects may allow. From there, we turn to the contemporary musical practices of circuit bending. Constructing experimental musical instruments from salvaged electronic parts, argues Trevor Pinch, raises all kinds of questions about musical sounds, technology, musicianship and skills in manipulating material objects. Rachel Mundy follows listening out into nature, as she studies (often portable) audio field guides for bird songs to observe how, since the mid-twentieth century, they have shaped very different forms of identification and appreciation among listeners. Alexandra Supper, finally, attends to the epistemological debates and the bodily and material practices involved in sonification (the auditory representation of scientific data) and finds that "listening" is not easy to contain within a neat box.

The contributors approach the themes of this issue from different angles, but there are several interesting intersections between the ways that they unpack listening practices, in terms both of the various material contexts within which these practices are embedded and of the different knowledges they help to generate.

One of the papers' shared concerns is the *materiality* of listening. The articles show how closely connected the practice of listening for knowledge acquisition is with the specific instruments and tools that are used to listen and to experience sound. We consider technology and materiality in a rather broad sense: the material objects and technologies that enable and mediate listening are not just traditional sound-producing objects – such as pianos, organs, electronic toys, audio

guides or computer sound cards – but also, for instance, the walls of the prisons that either block sound waves or let them penetrate. This emphasis on materiality also reveals the specific sets of practical skills that are required for listening with and through the objects, whether it is through the rediscovery of metallurgical know-how by Peters and Cressman's instrument craftsmen, the tactile sensitivity for manipulating circuits of Pinch's circuit benders, or the body-work that Supper's sonification researchers engage in when interpreting a complex sound in what they call "data karaoke". These practices underscore how, far from passive reception, such experimental listening requires a skilled interaction between tool and listener.

The materiality and practical skills involved in the interpretation and discovery of new sounds also raise questions of *agency*, which are addressed in several papers in this special issue. Whereas Tom Rice investigates how acoustical agency is negotiated in the soundscapes of prisons and how sound can act as a source of human agency there, Trevor Pinch considers some of the limits of human agency: the electronic musicians in the circuit-bending scene often stress the agency of machines and ascribe agency to their "bent" musical instruments. Talking about how the machines "trained them to listen" in a particular way, they reverse the idea that machines and instruments are passive, neutral tools in the hands of more or less competent human players. Pinch's essay not only asks how the circuit benders themselves make sense of their technological and musical practice, but also finds similarities and affinities with the academic practices of STS scholars, in that both help to deconstruct and challenge the taken-for-granted meanings of technology, and both wrestle with questions of agency. The relation between human listeners and animate non-human actors also surfaces in Rachel Mundy's essay, in the guise of the American birdsongs that populate the audio bird guides she analyses. Mundy identifies two very different ways of representing bird song, either as short snippets designed to teach listeners to identify particular species of birds quickly and efficiently, or as longer excerpts that celebrate the birds' musicianship, thus endowing them with agency and personhood. Mundy's article demonstrates that ways of listening to sound are often related to particular preconceptions of the objects or environments being listened to.

It is not, however, the connection between sound and technology alone that concerns us here, but especially the role of such materiality in the knowledge that listening helps to generate, whether in relation to new understandings of musical practices, new theories of hearing or new forms of scientific representations. The link between *practices* and *theories* of listening is therefore a second important thread running through the special issue. As several authors demonstrate, an intimate connection exists between knowledge about sound and the instruments we use to make or hear sound. Peter Peters and Darryl Cressman, for instance, show that building a replica of a fifteenth-century organ in the twenty-first century opens up questions about the relationship between materiality and musical culture. By understanding the process of building a replica organ within the context of the Early Music movement of the twentieth and twenty-first century, Peters and Cressman discuss how contemporary insights about sound and performance techniques are projected onto the past, and how in this process, knowledge is generated about the craftwork involved in building an organ as well as about fifteenth-century musical culture. Drawing upon Hans-Jörg Rheinberger's (1997) notion of "experimental systems", Peters and Cressman argue that the knowledge created in this process is inseparable from the material assemblages in which it takes shape. Their analysis shows that both the acts of building and playing musical instruments open up new theoretical approaches and other forms of knowledge about hearing and musical culture. The production of sound and its technical or aesthetic understanding thus enter into a feedback loop, promoting certain questions at the expense of others. Similarly, Pinch's article shows that the practice of circuit bending not only coaxes new kinds of sounds from electronic toys; in seeking and exploiting such – quite literal – feedback loops, it also enables experimentation with forms of musicianship and stimulates reflection on the role of technology in music. Although the circuit benders explicitly deny the relevance of certain kinds of knowledge and

often present their lack of engineering knowledge as a positive virtue, their practices nonetheless create new forms of knowledge and of engagement with technology.

In Alexandra Supper's analysis of the sonification community and its efforts to transform scientific data into sound, the relationship between theory and practice plays an important role as well. She shows how discourses about the epistemological status of sound are linked to the bodily practices involved in doing sonification work. The sonification community engages in epistemological debates about the relative merits of sound and vision, often staging the two as competitors. In the actual practices of sonification work, however, this relationship usually turns out to be less antagonistic: different sensory experiences form an inseparable whole. By discussing the interplay of multisensory practices and epistemological debates about sound, Supper touches upon another aspect that runs through many of the essays in this volume: the *relationship between sound and visual culture*.

Much of the literature in sound studies – and sensory studies more generally – begins from the assumption that vision has been given undue emphasis in our Western culture and that more attention needs to be paid to the neglected other senses, such as hearing (Bull and Back 2003; Erlmann 2004; Howes 1991). Certainly, a growing body of work on sound, as well as touch, taste and smell, has helped to redress this balance over the past two decades; nevertheless, as several papers in this issue note, vision is still a frequent reference point for thinking and writing about sound. In his contribution, Tom Rice sets out a persuasive case for the potential gains to be made by adopting an auditory perspective instead. Prisons are commonly thought of in terms of panopticons and surveillance rather than in terms of prisoners' opportunities for eavesdropping and self-expression, yet what such a visual template tends to obscure is that prisoners are not just passive objects of a surveillance system, but also play an active role in shaping their surroundings. Rachel Mundy's contribution can be read as reminding us nonetheless to remain sensitive to visual analogies and the uses to which they were put by historical actors. She shows that vision provides a point of reference even in contexts where there is a strong tradition of paying attention to sound: although birds were long been appreciated for their musical talents, visual conventions for representing birds still tended to influence how their sounds are used or staged.

By bringing STS sensibilities to the study of sound and the senses, the papers in this special issue show that the act of listening should not be black-boxed or taken for granted. Together, they may be read as a thick description of historical and contemporary listening practices, one that both complicates and enriches all-too-fixed notions of listening. By situating listeners within their material settings, the authors explore the fuzziness that acts of listening take on in practice – and the ways that the categories of instrument, environment and user, practice and theory, hearing and other senses may leak into each other. So let us open the music boxes and listen.

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