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Sonic things: knowledge formation in flux

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ABSTRACT

This Introduction presents the key concerns of "Sonic Things: knowledge formation in flux," a Special Issue of *Sound Studies*. Building on recent scholarship in sound studies, history of science, and thing studies, we use the term "sonic things" to describe sounds that stand in for other – elusive, inaudible, or ideal – sounds. Emerging from long processes of multidisciplinary knowledge production, sonic things equally have a quality in and of themselves. The Special Issue's contributions deal with the histories of sonic things that mediate between physical and metaphysical realms (Leendert van der Miesen, John Durham Peters); the sounds of musical instruments used to reach out to other times or places (Fanny Gribenski, Carmel Raz); and sonic things that moved back and forth between domestic spaces and sites of scientific inquiry (Viktoria Tkaczyk, Tiago de Oliveira Pinto, Flora Dennis). To trace these diverse trajectories, the contributors employ and re-evaluate a plethora of methods, from intellectual history and the history of reception and misconception, to discourse analysis, to the reconstruction of historical instruments and experiments. They speak to readers in a wide range of research fields, offering new perspectives on existing debates and new views on an ample body of historical sources.

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Introduction: Things that Sound

Viktoria Tkaczyk and Leendert van der Miesen

"What is this loud and sweet sound that now fills my ears?"

Cicero, *Republic*, 6.18

Not all sounds are made to be heard. A myriad of strategies have been invented to render audible what is beyond the threshold of human hearing, but certain sounds resist such strategies of audification. They remain silent for other ears, and they are continually being replaced by other sounds. Probably the most prominent case in point is the Pythagorean notion of *musica mundana*, according to which the spheres of celestial bodies – the planets, the Sun, the Moon – cause the most beautiful sounds when moving, sounds that, in most accounts, remain imperceptible to the human ear.[1] Some scholars strongly

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disputed this idea; Aristotle, for instance, argued that sounds created by such large bodies would be intolerably loud. Nevertheless, the notion that the cosmos emits inaudible sounds continued to exert its influence far into the modern period, and scholars, musicians, visual artists, and engineers applied a wide range of techniques to render the music of the spheres more concrete. To this end, the ratios of the celestial bodies were taken as a model for the definition of pitch spaces, for musical composition, musical instrument building, painting, and the design of performance spaces. What was produced through such approximations to heavenly proportions were substitute sounds, representations of the unrepresentable. ibid.

The Special Issue "Sonic Things: knowledge formation in flux" is dedicated to the histories of similarly elusive, non-cochlear, and ideal sounds: sounds of faraway places and times; divine or imaginary sounds; scientifically unexplorable sounds; private or secret sounds. In seven contributions, we trace the formation of knowledge on sounds that range from mythical echoes (Leendert van der Miesen) to the voice of God (John Durham Peters), the tuning of foreign and historical instruments (Carmel Raz, Fanny Gribenski), inner monologues (Viktoria Tkaczyk), the songs of birds (Tiago de Oliveira Pinto), and clatter from the Renaissance kitchen (Flora Dennis). The knowledge that gathers around such sounds, we argue, is always in flux. In search of the incomprehensible, it produces "sonic things" that stand in for the impossible sound. Sonic things, therefore, accumulate multiple epistemologies, folding together legacies of history and harbingers of the future.

Sonic things

By focusing on "sonic things", this Special Issue explores and reframes more general assumptions underpinning what has become a field of its own: thing studies. The notion of "things" attracts scholarly attention because it negates sharply defined boundaries between objects and subjects. Objects can be clearly designated by a name and used for specific ends. In recent years, such practices of objectification received much criticism. Exemplary in this respect is the French composer Pierre Schaeffer's mid-twentieth-century work on *musique concrete* ([1952] 2013, [1966] 2017). Schaeffer's experiments with a great variety of everyday sounds – the sound of bells, trains, alarm clocks, vibrating metal strips, bicycle horns – aspired to a new musical genre, untainted by the many traditions and habits that accrue around musical instrumentation. Schaeffer recorded the sounds on tape, isolated them from their sources and sonic environments, and processed them electromagnetically, celebrating the acousmatic character of the resulting *objets sonores*.

Recent scholarship, however, has criticised his approach as reductionist and idealistic (Kane 2014, 15–41). Schaeffer's proposal for a new typology of recorded sound, especially, is seen as following the very logic of "structural objectivity" that he condemned in traditional musical systems (Steintrager and Chow 2019b, 6–12, see also Chow and Steintrager 2011). To enable an autonomous "objecthood of sound", some argue, it is necessary to rethink the attitudes of modern listening, where the object is related to a knowing subject: "We cannot 'know' precisely what the sound object is, because no object can ever be fully known by, transformed, or translated into any other" (Moreno and Steingo 2019, 180). Such statements recall the work of philosophers such as Attali (1985) and Serres (2007, 2014), who proposed to consider sound in its own right, as something that resists being represented, structured, and objectified.[2] Other statements stress the

ubiquity and inevitability of sound objectification, citing far more radical objectifications than Schaeffer's. In electronic music, for example, "spectral objectivity" entails a rigorous decomposition of seemingly natural sounds (Sterne 2019).

This Special Issue addresses many different attempts to objectify sound, or, more precisely, the productive misconceptions that attended those attempts. History offers striking examples of scholars, composers, musicians, bird-lovers, and all kinds of other people who never fully encountered the sounds they were searching for. What they found instead were "sonic things": sounds that emerged from their pursuit, sounds that stood in for others, sounds that were once there.

Most work in "thing theory" derives from Martin Heidegger's notion of the thing as that which is present, while the "thingness of the thing remains concealed, forgotten" (1971, 168). Although things may result from processes of making, experimenting, or investigating, argues Heidegger, they reach out beyond their supposed function as objects. They accumulate multiple natures in and of themselves. Accordingly, thing theory regards things as being self-sufficient, meandering between the concrete and the abstract, the functional and the symbolic, the material and the immaterial. As such, things are never fully apprehended (Brown 2001). Things appear when an object loses its function, or when it cannot be described by a single value or identity (Mitchell 2005). In ecological terms, things emerge through material processes unfolding over time, rather than at specific moments (Domínguez Rubio 2016; Bennett 2010).

Quite along these lines, historians of science have famously asserted that most scientific enterprises work with "epistemic things" – the uncatchable objects of inquiry that appear and disappear *as things* within a concrete material constellation while keeping experimental research in motion (Rheinberger 1997, 24–37; Lenoir 2010, xiv). Our Special Issue, thus, addresses sonic things that were the intended or unintended result of long-term processes of scientific investigation.[3] If, in Heidegger's poetic formulation, the thing "never comes to light, that is, it never gets a hearing" (1971, 168), the present Special Issue looks at cases in which historical actors quite literally did give a hearing to a thing.

Take the example of the echo as it was conceived in seventeenth-century Europe (Leendert van der Miesen). At this time, mythological narratives, local experiences, and research programmes of the newly established scientific academies proliferated around the echo. Although the echo can be described as a singular entity, it took a different form and function in each poetic narrative, experimental setting, and attempted theoretical explanation. This multifarious echo may be compared to the "epistemic thing" that emerges from laboratory work in the modern life sciences, but its sonic nature made it especially difficult to grasp. In order to describe echoes, numerous techniques of visualisation, description, and circulation were developed, leaving unresolved the difficulty of linking individual experiences with collective experimentation and new acoustic theories. As such, in the early modern period the echo became an emblem for the quest to capture sound. ibid.

The technicality, objecthood, and materiality of things

"Sonic Things: knowledge formation in flux" can also draw on existing work on the reciprocal dynamics between epistemic things and the many technical conditions that set the boundaries of scientific research and "create the space in which an epistemic

object can unfold" (Rheinberger 2010, 218). In such processes, epistemic things and technical things seem to merge, at times even to such an extent that the technical thing takes the place of the epistemic thing. More broadly speaking, our Special Issue looks at artefacts, musical instruments, and media technologies that have helped to turn epistemic things into more easily identifiable "objects of knowledge".[4] These objects, we argue, produced productive misrepresentations of the things in question. The tuning fork, for instance, originally designed for tuning instruments in musical performances, appeared in nineteenth-century debates on musical historicism as a veritable "time-travel machine" (Fanny Gribenski). In this period, processes of nation-building were accompanied by the formation of musical canons and an increasing interest in historical standards of music. The glorious past became a "sonic thing" that was to be reconstructed. For this purpose, instrument makers started to bring together immense collections of tuning forks to indicate the exact performance pitch of various different times and places. The sounds of these forks took the place of the lost past.

Some things, however, react against the strategies of objectification. Their ineluctable materiality, self-sufficiency, inscrutable complexity, and long-standing cultural meaning make them speak for themselves. Recent scholarship in the history of science has drawn attention to a variety of such "things that talk". Through a range of examples from the visual realms of science – whether Rorschach inkblots, Harvard's collection of glass flowers, or the Peacock Island in the Prussian river Havel – it is argued that things have prompted researchers to speak in *their* tongues: "Even if they do not literally whisper and shout, these things press their messages on attentive auditors – many messages, delicately adjusted to context, revelatory, and right on target" (Daston 2007, 12). Yet there are things, our Special Issue shows, that actually do whisper and shout. The Mormon Tabernacle in Salt Lake City, Utah, for instance (John Durham Peters), has been the object of religious, scientific, technological, political, and cultural fascination since its construction in the 1860s. To this day, visitors are treated to a pin-drop performance that demonstrates the Tabernacle's unique acoustic properties as a kind of whispering gallery, or giant "vocal cavity", made of plaster, stone, untanned leather, and horsehair, all contributing to its particular acoustics. But the building seems to resist being reduced to an object of architectural knowledge alone. It recalls a material and imaginative soundscape that depends on what orators, listeners, and scholarly investigators wish to, or believe they can, hear in it.

Multiple knowledges

Things are in flux; and they never act or stand alone. They are not tied to one particular cultural setting, nor can their history be told in bounded biographical terms. The broad range of sonic things presented by the contributors to this Special Issue form part of a multilayered history of techniques to produce, capture, represent, maintain, or modulate sound. Most of the things carry the knowledge of instrument makers, musicians, engineers, scientists or scholars, and collectors all at once. How such multiple knowledges compete and constantly challenge each other is revealed in the story of "how the sheng became a harp" (Carmel Raz). At the beginning of the nineteenth century, several new free-reed keyboard instruments – among them foot-operated parlour organs, accordions, and mouth harmonicas – emerged in Europe. They generated two diverging clusters of knowledge.

Most instrument designers, musicians, and music critics considered them to be a further development of Romantic windblown string instruments, the Aeolian harp in particular; a number of acousticians, by contrast, were fully aware of the East Asian origin of free-reed technology, having encountered it in the Chinese mouth organ, the sheng. But these acousticians' references to the sheng were widely ignored, downplayed, or deliberately concealed in favour of an allegedly French or German origin of the free-reed technology. What resulted were hybrid sonic things: combinations of ethereal Romanticism, scientific provenance research, and practices of cultural appropriation.

Things sound differently depending on who is listening. Such different perspectives do not always correspond with the dividing lines between musicians, engineers, and scientists. Often, they cross scientific disciplines. The interior monologue, for example, prompted a clash between different disciplinary views in the long twentieth century (Viktoria Tkaczyk). Neurophysiologists, developmental psychologists, psychoanalysts, and linguists were equally fascinated by the fact that humans regularly talk and listen to themselves. However, they strongly disagreed about the nature of the thing in question. Scholars such as Lev Vygotsky, Sigmund Freud, Roman Jakobson, Ruth Hirsch Weir, and Jacques Lacan all formulated now famous, but incompatible, theories on the interior monologue. In doing so, they made creative use of a great variety of research tools. To turn the interior monologue inside out, they used and shared notebooks, tape recordings, and materials produced by computer programs.

Investigating the variety of knowledges brought about by these tools, our Special Issue follows media archaeological approaches that argue against a view of technological tools as being bound to specific epistemologies or clear-cut periods of scientific knowledge production (Zielinski 2006). The seven contributions illuminate instead the many routes, dead ends, and productive detours provoked by the technologies that appear in their stories. Whispering galleries, tuning forks, tabernacles, harps, tape recorders, cutlery, and mobile apps form part of not a singular knowledge culture, but a multiplicity of epistemic strands – and so do the sonic things that they produce.

Traces of the past

Our Special Issue profits from several studies that have addressed the role of historical practices and traditions of knowledge in the objectification of sound (Jackson 2006; Bijsterveld 2008; Kursell 2008). More specific work has also been done on the historical formation of "hearing cultures" or "sonic skills" around certain sound objects (Thompson 2002; Erlmann 2004; Abbate 2016; Bruyninckx and Supper 2016; Davies and Lockhart 2017). Most of this scholarship has favoured the modern period, however, whereas our key contribution is to situate sonic things within longer processes of the triadic formation of concrete sounds, instrumental objectification, and knowledge. Merging microhistorical and macrohistorical approaches in fruitful new ways, each paper highlights a particular sonic thing and traces its ramified genealogy over long periods of time – not necessarily chronologically, for there are also leaps and loops in time. Often telling the stories of sonic things back to front, the articles consider what those things lost on their journeys through time: how they were transformed, sustained, redefined, mislaid, and rediscovered. It is through sociopolitical or scientific negotiation, translation, and transmission that things cross boundaries of nations, social units, or disciplines (Secord 2004; Winter 2013). Dealing

with the historicity of sonic things allows us to explore overlaps between materially tangible objects (sound recordings, measuring instruments, written or pictorial representations of sound) and immaterial things (imaginary sounds, epistemic sounds, distant sounds). We ask when and how imaginary things became concrete objects or vice versa, and how sonic things changed in their materiality and function over time. We trace their provenance, their making and value, and the layers of historical knowledge that sediment in them. When have these things marked the transition from practical action to scientific research, and how have they circulated between disciplines or escaped from scientific contexts to become everyday or art objects?

A fascinating light is cast on these questions by the ethnographic observation of birdsong contests in the Harz region of Germany (Tiago de Oliveira Pinto). The songs of the finches presented in these contests are neither "naturalistic" nor "works of art" alone. They are sonic things that result from sophisticated training, ritualistic rules, and practices of birdsong competing and judging. Each song bears the traces of an almost five-hundred-year-long praxis of aviculture, or rather of changing practices, skills, and technologies in aviculture. Whereas the finches were previously trained by other birds, for example, twentieth-century finchers started to teach them by means of CDs, mp3s and, more recently, bird recordings shared worldwide through mobile apps.

Addressing the long-term, transnational, and large-scale reconfiguration of "sonic things", our Special Issue ends with a reflection upon the things that result from our own work as historians. Flora Dennis shows how the sound of the meal in Italy between 1300 and 1700 could potentially be reconstructed using many kinds of historical sources: objects, now preserved in museums, that were once used to prepare and consume the meals (ceramics, glass, and metalwork); historical recipes and dining protocols; treatises on the design of kitchens and dining rooms. These sources do not refer to a particular meal, but recall a whole range of attempts to set the right tone for Renaissance dining. By lending an ear to these sources, we can embark on a journey across periods, social boundaries, and regional practices. The resulting sonic thing always sounds different, and never the way that we expected. ibid.

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Notes

1. *Musica mundana* was considered to be audible only to those with extraordinary powers (as attributed to Pythagoras by his biographer Iamblichus), in dreams (as detailed by Cicero and Macrobius), or to humans on the outer edges of the world (according to the Church Father Ambrose). The standard work on the theme is still Haar (1960). For an overview of recent

work, see Prins and Vanhaelen (2017) and Hicks (2017). On acoustic cosmologies outside Europe, see, for example, Brindley (2013).

2. On the critique of such essentialist approaches to sound and the resulting "audiovisual litanies", see Sterne (2003, 15), Chow and Steintrager (2011), and Steintrager and Chow (2019a, 10).
3. Artist and writer Salomé Voegelin also applied the Heideggerian notion of "thingness" to sound (2010, esp. 16–20, 2014, 92–95). Whereas Voegelin aims for a new ontology of sound, the contributions to this Special Issue follow earlier work by historians of science and music who applied the notion of the "epistemic thing" to historical experiments on sound (Kursell 2017; Steege 2017; Rehding 2016).
4. We additionally build here on Daston (2000), Smith and Schmidt (2007), and Bensaude-Vincent et al. (2017).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Viktoria Tkaczyk is full professor at the musicology and media studies department of the Humboldt University Berlin. She has published widely on technological experimentation and testing, stage design, architecture, and sound media in the early modern and modern period. Currently she is completing a book entitled Thinking with Sound: New Agendas in the Sciences and Humanities around 1900 and preparing a new project on the history of the applied humanities. Before coming to Humboldt University, she headed the Max Planck Research Group "Epistemes of Modern Acoustics" and the German Research Foundation–funded project "Epistemic Dissonances: Objects and Tools of Early Modern Acoustics" at the FU Berlin (CRC 980), and initiated the database "Sound & Science: Digital Histories."

Leendert van der Miesen is a PhD student in Musicology at the Humboldt University in Berlin. His work focuses on the relationship between music, sound, and science in the early modern period. He is currently a predoctoral fellow at the Max Planck Institute for the History of Science. From 2017 to 2020 he worked within the German Research Foundation–funded project "Epistemic Dissonances: Objects and Tools of Early Modern Acoustics" (CRC 980).

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