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Sound of Nature: Soundscapes and Environmental Awareness, 1750-1950

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Sound is at the centre of multiple ongoing debates in the ecological and geophysical sciences, environmental humanities, and science and technology studies. Particularly in the historically-minded humanities, sound has been repeatedly hailed as an emerging object of study without ever attaining the quantity or status of research in visual and pictorial fields (Morat). Scholars working in the history of science and technology have, over the last two decades, developed research on different aspects of sound history that reach beyond the history of acoustics as a science. There has been important work focused on listening practices, for instance, on hearing, and on the mechanization of sound (Thompson; Mody; Bijsterveld; Bruyninckx, *Listening in the Field*; Tkaczyk). Nevertheless, the role of sound in environmental history has been comparatively under-examined.

This special issue emerges from an international, interdisciplinary project which aimed to overcome this gap by placing the relationship between nascent environmental thinking and sound in its social, cultural, ideological, and emotional contexts, while exploring its long-term role in shaping the perception of the world around us. Although "sounds are a perpetual and dynamic property of all landscapes," it is also clear that they "vary spatially and temporally" (Pijanowski, Villanueva-Rivera et al. 203). There has, however, been less work focusing specifically on the historical, literary and geographical role of sound in shaping the landscapes of environmental history. While Peter Coates' seminal paper delineating the potential of an environmental history of sound helps us to unravel some of the early literature, few works with a similar focus have emerged in the years since it was published (Hehl and Hardenberg 79). Instead, historical descriptions of sound in nature tend to be included as mere additions to accounts of the visual perception of landscapes. Where historical scholarship does focus on sound, it does so mainly by describing disturbances and noise as pollution, rather than reflecting on how "natural soundscapes" are the product of multiple overlapping layers of sound (Schafer). Noise is frequently opposed to nature and/or silence – and, thus, silence is also frequently linked to nature. Consequently, natural quiet is perceived as something that needs to be protected and the affective and emotional power of natural sound is side-lined or effaced completely.

By contrast, there has been a greater recognition of sound in literary studies, perhaps because language has its own sonic dimension and environmental approaches to literature have been looking to oppose the tyranny of the eye and of landscape painting for many decades. Nevertheless, the focus has tended to be more on sound in general and often with questions of form at the heart (Leighton; Attridge) or highly focussed on certain literary genres, especially lyric (Culler). More general approaches have often been limited to relatively specific historical moments in the canonical periodisation of the discipline. Relevant examples of the latter are the two magnificent volumes of online essays in the *Romantic Circles Praxis Series*, edited by Susan Wolfson and Michele Speitz and entitled respectively "'Soundings of Things Done': The Poetry and Poetics of Sound in the Romantic Ear and Era" (2008) and

"Romanticism and Sound Studies: Recording Romantic Relationality" (2024). In the more recent volume, Elizabeth Weybright offers an excellent footnote listing critical works which reflect how recent "literary scholarship has begun to question what it might mean to regard sound as more primary to the Romantic imagination than has previously been acknowledged" (n.p.). Nevertheless, Weybright also acknowledges the tendency of literary scholars to focus on sound through the lens of a particular author. In our own work, we recognize the value in expert readers of individual authors, particularly when close-reading the texture of their writing, which has particular importance when focusing on sound. However, we also recognize the importance of understanding broader cultural and institutional trends as they unfold across time, an approach not limited to but certainly deployed powerfully by environmental historians. In this, we are committed to an interdisciplinary, transhistorical, and transnational perspective even when focused on the work of a single writer. Thinking explicitly about the subtle differences between even related disciplines like history and literature is one of the many advantages of interdisciplinary working (which we discuss later in this article).

The conceptual territory in which we move is extremely complex. Theodor Adorno is sensitive to the relativity of sound when he describes the extent to which "we can tell whether we are happy by the sound of the wind": "It warns the unhappy man of the fragility of his house, hounding him from shallow sleep and violent dreams. To the happy man it is the song of his protectedness: its furious howling concedes that it has power over him no longer" (49). The concepts of sound, silence, and noise – and their classification as natural, wild, artificial, or man-made – resist simple definition, particularly when examining diverse authors across different historical periods. In particular, reaching back at least to Aristotle's writings, "nature" as a concept has historically had multiple meanings, that are often used in parallel rather than exclusively (Casetta 2). Due to the term's inherent flexibility, rather than impose strict definitions, we prefer to analyze how these terms are interpreted and used by the historical actors themselves in our source materials. In this sense, when discussing "nature," we are often referring to "external nature" – the encompassing system in which humans participate but do not create (Castree 6). This "nature" is one that goes beyond Aristotle's categorizations to focus on "nature as physical place, normally contrasted with the urbanized environment" (Casetta 2). Since, however, this definition has issues of its own, as it reiterates a problematic dichotomy between "human" and "natural", we also agree with Casetta on the usefulness of considering, on a meta-level, natural and artificial as the abstract extremes of a continuum. How a certain "environmental object", such as a place, a landscape, a species, or a sound is situated along this continuum is spatially and temporally determined in a way that potentially affects both its perception and its management (6; 10–13).

Working with the evolving definitions of relevant terminology, the work in this special issue attempts to find various routes into and through this difficult territory. As noted by the historian and ethnologist Richard Cullen Rath ("Silence and Noise" 73), the social, cultural, and historical setting will make what is noise for one person into music or quiet for someone else, and vice versa. As Salomé Voegelin has put it, "Silence is not the absence of sound but the beginning of listening" (*Listening* 83) or, to use Coates' wording, "noise frequently resides in the ear of the listener" (641). As noted by David Novak (129), noise is associated with industrial and urban modernity at the beginning of our period of historical interest. In combination with the fact that nature has been presented as silent or quiet, this has led research on the history of noise and sound to focus on environments related to urban and peri-urban areas, rather than

looking at spaces perceived as "natural" or "wild" (see Smilor; Payer; Toyka-Seid; Morat; Missfelder). However, these categories are unstable and nuanced and frequently occupy shared territories. As Raymond Williams famously put it, "Nature is perhaps the most complex word in the language" and this is especially true with the paradoxes of sound and silence (219). Considerably before Rachel Carson's *Silent Spring* the romanticization of the idea of a silent wilderness, was widely and sharply criticized by tourists and conservationists alike: silence, in fact, would be an indicator of a dead ecological niche, or at least of the occurring of some major disturbance. Man-made noise (anthrophony) often sits alongside more obviously "natural" sounds produced by plants or animals (biophony) as well as by meteorological and geological sources (geophony) (Pijanowski, Farina et al. 1218-21). In many accounts, non-anthropic noise is the "keynote sound" of a natural environment – that is the typical sounds of a specific place, that characterize a soundscape in relationship to others (Schafer 9-10). Anthrophony is, instead, registered by contemporary ecologists as pollution "that degrades the sonic balance of nature" (Novak 129). However, noise and quiet are often even more radically intertwined.

As a result, R. Murray Schafer's celebrated concept of "soundscape", an expansive interpretation of which is used throughout this special issue, provides a useful tool for analysis because it encompasses all sounds especially those that usually go unnoticed and regardless of how specifically they are interpreted or connoted. Here, disturbing sounds could be deemed natural and sounds that one associates with culture could reveal themselves as having remained unnoticed and thus become normalized, or vice versa. Originally defined by Schafer as a "sonic environment" (274-75), the idea of the soundscape has later been repurposed to better accommodate the interests and skills of scholars in the humanities. In the project that has led us to assemble this special issue, we make use of the definition of a soundscape given by the American historian Emily Thompson: "simultaneously a physical environment and a way of perceiving that environment; it is both a world and a culture constructed to make sense of that world" (1). We also build on the ideas of the Greek musicologist Makis Solomos, and consider a soundscape, just as he does for sound in general, as "a fabric of relationships that includes not only the imagination and the listener's body, but the (real) environment as well" (107). Soundscapes as we understand them incorporate thus not only the actual sounds that exist in a given place but also acts of historically determined human perception. It is in this combination of material and cultural elements that we find soundscapes in text: as mere description, valorization of certain sounds over others, and expression of emotional attachment. Seen from this perspective, a broad understanding of soundscape is enormously useful and helps us to think interconnection and complexity in sound. At the same time, however, its very expansiveness can efface some of the complexities and specificities of its deployment. That is one reason why the individual contributions of this special issue are so committed to the more specific work of exploring in detail case studies of historical soundscapes which have influenced early forms of what has in later stages become framed as "environmentalism".

The historiography of sound also offers studies which aim to reconstruct the soundscapes of the past (Smith, *Listening to Nineteenth-Century America*; Corbin; Picker). Most studies focus on urban environments (like so much sensory historiography) or on heavily anthropized environments. Moreover, the attention has mostly focused on the reconstruction of pre-modern and early modern sound worlds (see Angliker and Bellia; Clauss et al.; Lewis; Rath, *How Early America Sounded*), an issue put at the centre of historians' attention since Lucien Febvre recognized in the 1940s the importance of sound in environmental awareness before the eighteenth

century (Rosenfeld 320). Less has been written about the role of sound in environments perceived as natural or wild from the eighteenth century onwards, which is surprising since this period is frequently considered to have been central in constructing contemporary environmental ideologies and in developing institutions for environmental conservation (Bate; Buell). Where this period has been considered, there has tended to be a focus on specific local soundscapes (Chesnokova et al.; Taylor; Taylor et al.).

Investigating the sound of nature is a way to facilitate a broader understanding of human interaction with the natural world. The study of both exemplary and neglected sounds can shed new light on the complexity of natural soundscapes: situating them at the nexus of sound, context, media and representation. In existing literary and animal studies, birdsong has been the category of natural sound most likely to be treated in this way (Rothenberg; Mackenney, *Birdsong*), having long been recorded through forms of notation (Bruyninckx, "Sound Sterile"; Hui) and, since the early twentieth century, phonographically and in other media (like the sonogram in David Rothenberg's afterword to this special issue (112). The sounds of nature can be recreated, recorded, or preserved, but the ways in which they were experienced in the past – their affective and emotional impact – requires further extensive investigation through the many textual and archival sources that have captured it both directly and indirectly (Smith, "Echo" 59-62; Bull xxi). Investigating how sound was recorded and represented before audio technologies requires an expansiveness of both method and objects of study. As Grimshaw-Aagard notes, sound studies, by looking at the role of memory, knowledge, and emotion in shaping our perceptions of sound, is able to open new perspectives not just of natural sound but also of our general understanding of society and culture (22).

For historical soundscapes, then, specific questions arise. First, how was natural sound recorded before the advent of, and then widespread use of, portable recording technology? This requires investigation through textual analysis and a study of both written and visual archival materials. Second, how does the textual recording of sound have an impact upon environmental awareness? Sound has an affective, even emotional impact, that has to be traced through its contexts and politics to the rise of environmental thinking. Third, what impacts do different national contexts have on natural soundscapes? Here again the context in which sound is heard and then how it is mobilized in textual representation must be carefully traced and understood. Fourth, what can be learned from different disciplinary contexts and their methods? The complexity of natural soundscapes, the confluence of factors which form their representation and reception, makes interdisciplinary study necessary. Together these questions generate answers that offer a more nuanced understanding of the role played by natural sound in environmental awareness as it grew into what we would now recognize as environmentalism. Whether through textual recording, visual representation, in memory, provoking affect or emotion, generating new knowledge or better understanding, natural soundscapes are rich sources for fresh analysis.

How were the sounds of nature recorded before the advent of audio recording technology?

Before the invention of audio recording technology, scientists, naturalists and poets were often most reliant on language in their efforts to capture the sounds of the natural world. In one sense, sound as an event was transitory and unrepeatable, made up of components and a context produced in and by a singular moment. Literary description, along with more experimental forms of notation, was one of the methods available to preserve natural sounds (Bruyninckx, *Listening in the Field*). While visual artists could

produce minutely detailed pictures and illustrations of individual animals and whole landscapes, natural historians throughout the nineteenth century largely relied on literary and poetic techniques to describe sound. They deployed onomatopoeic folk names, birdsong mnemonics, verbal descriptions and quotations from the poets, among many other techniques, to give their readers a sense of how creatures and other parts of the natural world sound (Hui). Furthermore, while early mechanical recording attempts and experiments with notation could generally capture the sounds of one species at a time, descriptions were able to portray entire soundscapes.

Historical mechanical recordings are not as transparent as they are today, of course: they often lack contextual information in writing (metadata) about their temporal and spatial specificity. But modern mechanical recording techniques are also not as transparent as often assumed (Voegelin, "Sonic Materialism"; Wright). Onomatopoeia suffered from a similar limitation as early forms of mechanical recording: when not used in combination with other methods, it only allows for the description of the sounds made by an individual species; it is also highly dependent on shared cultures and knowledges, from the spelling and pronunciation of the author's mother tongue to considerable variations in individual experience. Onomatopoeia might also act as a form of personal mnemonics that lacked transferability, not only between different linguistic and cultural structures, but often also within them. In this sense, onomatopoeia is a useful limit case for the use of language in recording the sound of nature. Nevertheless, there may be less difference between the technology of language as a means of recording sound and newer forms of recording technology than might be expected.

To offer a new conceptual tool for the analysis of how sound is perceived and communicated before, beyond and beside mechanical and electronic forms of audio recording, we call the written forms of sound recording at which we look in our works "textual recordings". Textual recordings of soundscapes are as biased and constructed as mechanically recorded sounds, involving processes of selection and the highlighting of certain sounds to convey specific messages or impressions of the sounds produced in a particular landscape. Such processes might also aim at depicting an ideal soundscape. Unlike later forms of audio recording, which reproduce a singular moment, textual recording can, through the use of a combination of methods that include visual imagery, provide a broader sense of a soundscape, including the impressions and emotional involvement left by sound. In realist fiction of the second half of the nineteenth century and the early twentieth, for instance, sound was represented through extensive description, that attempts to recreate the feeling it produced, rather than specifically the sound itself. Textual recordings also offer insights into how sounds were perceived in the past, as authors would describe not only what they heard but also their feelings, sensations, and the overall sonic environment they were experiencing. This allows for a more nuanced interpretation of nature's sounds both as they are culturally constructed and as their very real manifestations affect culture.

Starting with Romantic approaches to the sound of nature in the late eighteenth and early nineteenth centuries, we chart both the continuities and discontinuities between foundational proto-environmental thinking in that period, across the rest of the nineteenth and twentieth centuries, and into our own moment of profound ecological crisis. Both Romantic and late-Romantic positions on natural sound, as well as early conservation discourses later in the nineteenth and early twentieth centuries continue to shape attitudes to the sound of nature, whether as a counterpoint to new noises or as a yardstick by which to measure pre-existing soundscape norms. Authors of these texts captured the sounds of nature in the form of literary and atmospheric scenes filled with

emotional expressions that shaped and circulated cultural knowledge and collective memories of natural spaces and species. With this, they did not (just) aim to explain or spell out individual sounds to pass on knowledge, but also to communicate an interpretation of a natural auditory space and its inhabitants. The personal and affective stories built around these sounds of nature indicate a strong emotional investment that, in the form of a narrative, could unfold identity-forming effects in a larger community over time (van Dijck 108). We engage with complex, multilayered and dynamic soundscapes, whose recording in text through both descriptive and poetic language creates a means of communication that culturally influences its own consumption.

Technology has now enabled us to hear sounds we have never heard before; scientists armed, for instance, with underwater microphones and digital mixers can listen to and analyse sounds that due to their frequency or the medium of their transmission were beyond the immediate acoustic grasp of humans as a species. As numerous recent books and radio and television programmes have emphasized (Bakker; *Secret World of Sound with David Attenborough*), technological developments have to this extent enabled us to eavesdrop on animal worlds teeming with communicative skills that reflect complex social organizations as well as emotional bonds and connections. Technology has in this respect brought us closer to the natural world, but something is lost as well as gained. We can listen to recordings of dolphins and whales or make the sounds of mice or giraffes hearable (Hardenberg, "Hearing"), but alarming numbers of young (and older) people today cannot name or identify birds by the sounds they make, including familiar garden species such as robins and blackbirds (see Macfarlane 1-14 for a broader diagnosis of the impoverishment of our vocabularies for the natural world).

Writing is also a recording technology and it is one which environs (Sörlin and Wormbs). As such, like other forms of recording technology, it shapes environmental awareness. Over the past three centuries different modes of textual recording have constructed and/or limited our modes of environmental understanding as much as other forms of measurement (Hardenberg, *Sea Level*). But, like other modes of recording, writing has both specific qualities and specific challenges associated with it. For example, literary descriptions and poetry allow us to raise or lower the volume at will, even before technology came to our aid, highlighting and hiding different aspects of the soundscape. In his efforts to "syllable the sounds" of the nightingale, the romantic poet John Clare, with just a pen in hand, listened attentively to the sounds that he sought to transcribe. Somehow, his example shows us how the absence of recording technology may be seen to have required and enabled a different kind and quality of environmental awareness (Mackenney, "Stranger Notes" 38). In a related vein, George Eliot in one of the most famous passages from her 1875 novel of provincial life, *Middlemarch*, shows how imaginative writing can offer access to sound that was otherwise inaccessible. "If we had a keen vision and feeling of all ordinary human life", Eliot writes, "it would be like hearing the grass grow and the squirrel's heart beat, and we should die of that roar which lies on the other side of silence" (351). Eliot imagines the ability to hear the most extraordinary natural sounds in order to register her dismay at the limitations of the human senses, limitations that include listening, of course, but reach towards wider failures of community and understanding of all forms of biological life.

How does textual recording of sound have an impact on environmental awareness?

The textual recordings to be found in literary and historical sources and their communicative capacities have a direct impact on the emergence of environmental

thinking and its development across the nineteenth and twentieth centuries. There is an established genealogy linking Romantic period literature and culture with emerging environmental awareness in Britain, but also in exchange with other European countries (particularly Germany in the fields of literature, philosophy, and the natural sciences) (Bate; Wulf). Playing such a central role in the literature of the period, sound has shaped broader cultural discourses around conservation, as well as the critical discourses shaping our changing views of the relationship between literature and environment throughout the nineteenth and twentieth centuries and into our own. Nevertheless, until comparatively recently, sound has been neglected as a *primary* focus by critical studies on Romantic literature (see Speitz and Wolfson).

Textual recordings offer emotionally resonant soundscapes that are embedded in readers' ideas of their local environments which interact with a broader national construction of nature and the various actors within it. Due to the transient nature of sound, the ability to experience a particular soundscape at different moments depends on the persistence and reproducibility of ecological processes. Describing a soundscape becomes a form of proto-ecological analysis, unveiling connections between species and their surroundings. Sound serves as an indicator, bringing attention to absences and alterations within a localized ecosystem. This aspect of sound analysis was acknowledged early on in the examination of natural sounds (Hui). Textual recordings of natural sounds create a distinct awareness of a place's ecologies. Preserving and studying such descriptions not only extends the timeframe for analyzing ecological changes but also raises awareness about material transformations and shifts in attitudes and perceptions over a long period.

The emergence of bird and nature protection movements in Germany and Great Britain between the end of the nineteenth century and the beginning of the twentieth is strong evidence for a fundamentally changed understanding and appreciation of natural spaces and their inhabitants (Ditt; Evans 22-58; Knaut). The high presence of popular science formats like books, zoos or museums throughout the nineteenth century testify to "ordinary" people's enhanced curiosity in science and, by the end of the century, had disseminated scientists' and authors' ideas about the protection of certain species or landscapes (Schwarz 226-27). The whole period we look at also experienced a real growth in nature writing, accompanied since the 1850s by a sense that that natural soundscapes and environments were becoming increasingly important to national health as the urban soundscape became turning into noise. Despite the fact that we cannot say much about the readers of this literature and the visitors of natural history museums – their sex, age, profession, their motivation to know more about sounds in nature, or their prior knowledge about local environments and animals – the weight of non-fiction texts and periodicals about birds that exist from the early nineteenth century on (in Germany and Great Britain alone) implies a broad audience with a strong wish to learn about natural phenomena and complex animal behaviour in an entertaining manner.

What do different national contexts tell us?

Close-reading of sources with attention to minute particulars in language and context amplifies the differences between national (and, indeed, regional and other) contexts. Also, language plays a critical role when thinking of how the sounds of nature are heard in different regional and national contexts. Some of the most influential works of natural history were written in the epistolary mode: in the *Natural History of Selborne*, Gilbert White's detailed descriptions of local flora and fauna appear in letters addressed to friends and naturalists, such as Daines Barrington (1727-1800) and Thomas Pennant

(1726-1798), who hailed from other parts of the British Isles and belonged to larger scientific international institutions, networks and communities. Their letters to each other compare the local with the global, the particular example with a more generally applied rule or essential principle. Such comparisons are vital to scientific understanding, but they also lead to various points of contrast in terms of the language, traditions and culture of different regions and nations. By comparing how the sounds of nature are represented in different national contexts, we can start to get a sense of both ecological and cultural connections, patterns, contrasts and variations.

Of particular interest is what such contrasts might tell us about language as the principal method of recording the sounds of nature in the centuries before the advent of recorded sound. As Jeremy Mynott points out, the cuckoo sings *kuckuck* in German, *cucolo* in Italian and *kukushka* in Russian (161). By comparing how its two notes are differently inflected in different languages, further research beyond our own project could further explore the subtle ways in which the phenomenology of a language may shape how the sounds of birds are articulated or even heard by its speakers. Translation becomes a key concept here, because it is a good way of thinking not only about these questions but also about the mechanisms for natural sound being recorded, and for the forms of reading and listening that occur in reading texts even within singular national contexts.

Specific national sensitivities also impact which types of sounds are emphasized when textual descriptions of soundscapes are made. When conducting comparative studies, it is essential to recognize that the selection process involved in textual recording may affect how a soundscape is depicted more than actual differences in what was heard. Different national contexts also tell us that politics could shape the way popular science was communicated. In Germany, for instance, ideas of Heimat, national unity and, more specifically, Germanness were stressed as arguments for the affection for and protection of local, familiar birds and other German animals in nineteenth-century popular science texts. The concept of nationality, that especially in Germany is strongly intertwined with questions of territory, language and culture, was extended onto natural spaces. This extension led, under specific conditions socio-political, also to construe ideas theorizing the possibility of national soundscapes of nature. A development that was notably avoided in Great Britain, where soundscapes seem to have remained local occurrences, that could not be scaled to the national level.

What do different disciplinary contexts and their methodologies tell us?

It is possible to investigate natural soundscapes from the perspective of just one discipline. It would, however, result in an extraordinarily flat analysis. The histories of the development of academic interrogation of both sound and nature show that multiple disciplinary knowledge is foundational. Sound studies commonly brings together practices from music, geography, history and the social sciences. It has, more recently, also included literary and media studies. The study of the environment, leaving aside the numerous interrogations of the sciences, is now commonly named as environmental humanities. This sub-field, like sound studies, brokers multiple disciplinary methods, from literature, history, geography, law, linguistics, and media and cultural studies. These lists leave out, of course, numerous other disciplines contributing to the vitality of study across both areas. What is more critical here is the relationships emerging between the disciplines we have employed to consider natural sound. This speaks, inevitably, to different forms of disciplinary combination; to the differences between multidisciplinary, interdisciplinary and transdisciplinary research practices. The definitions of these forms of knowledge-making are numerous and contested (see

Callard and Fitzgerald; Klein; Moran). There is no need to rehearse those here. Rather, the question we pose is what does studying natural sound as either a literary critic or a historian bring to bear on the identification of objects of study, the direction of research, and the conclusions arrived at?

The analysis of literary sources from the perspective of the literary critic can certainly help us to imagine how places sounded and indeed might be regarded as repositories of lost sounds. Poetry, in particular, although this does also apply to imaginative prose, may help us to recover now missing soundscapes, such as the distinctive "crex crex" of the corncrake, which could still be "heard in every vale" when Clare was writing in the 1830s (line 33). Literary texts, as we have noted elsewhere in this introduction, also allow for simultaneously-produced sound to be heard (read) distinctly. Indeed, literary texts, free to engage different temporalities, can bring together sounds that would commonly be disparate through the many different techniques that literary writing deploys and which literary critics are well placed to recognize, reveal and document. Literary analysis, then, is capable of producing an analysis of natural soundscapes that registers their complexity and richness, but also places them within the broad contexts that define their relationships to the human world, its societies and communities. Literary critical analysis of soundscapes is also an understanding of sound across time; often mediated by particular literary forms or genres and specific literary movements (such as romantic poetry or realist fiction). Through one of its principal methodologies, close reading, literary critical analysis engages in detail with natural sound in individual instances, giving rise to an understanding of sound that is deeply located and often unique. At the same time, by paying close attention to the contexts for literary production, literary critical knowledge is aware of the temporal configuration of literature – its place within the culture of its time. This is where it comes closest to the discipline of history.

To understand natural soundscapes demands historical understanding of broader social, cultural and natural trends as they occur over time, particularly within the period from the second half of the eighteenth century up to the period where audio recording of sound became more commonplace and then sophisticated. It is equally necessary to understand the development of such trends in recent years, to recognize the period which was central to the formation of our own ideologies and institutions and to illuminate the radical change of pace in environmental processes that have witnessed the rise of new, no-analogue, and feral natures. Contemporary historical research is supported especially by new digital methods. Using these is essential to locate historical sources dispersed across numerous journals and archives (Hardenberg and Hehl 81-85). The increased availability of digitized sources, and crucially the searchability of these sources, has facilitated the exploration of an extensive compilation of nature-related writings that would have been almost impossible before such tools were available. This has facilitated research that combines close and wide reading of texts, enabling the historian to locate a significant corpus of texts presenting an awareness for the sounds of nature. Another important method is taken from recent disciplinary developments in the history of emotions: becoming alert to the feelings that sounds recorded in text elicit and the representation of these emotions in writing (Snaith).

While literary and historical analysis are obviously close cousins in disciplinary terms there is considerable cross-correspondence in their methods that illuminates the benefits to be gained from an interdisciplinary engagement with the sounds of nature. Both disciplines depend upon the analysis of documentary sources, and often the same sources. What is profitable in an interdisciplinary analysis is the complementary but

importantly different epistemic status of the questions asked by each discipline. Both literary studies and history, for example, might examine a work of natural history but will ask crucially different questions – of the implications of the writing, the context of its production, its depiction of natural soundscapes. Such methodological depth and variety are both central in an interdisciplinary project such as this one. The subtle differences in method allow for a more complete understanding of the perception of the sounds of nature over the *longue durée*. It is vital to recognize, however, that this form of interdisciplinarity has its boundaries. It involves only two disciplines, and these are already cognate with one another. What it does not offer is the productive collision that might arise from very different combinations, although it does avoid the consequences of finding that very different disciplinary knowledge is both intellectually and practically difficult to parse intelligibly within a single study (Beer 173-95; Ruston 1-12).

Crucially, a literary and historical analysis of natural soundscapes has led us to one key conclusion: that the objects of study are themselves interdisciplinary. The richest documents, those adding most value to the research, are themselves texts that depend, at least, upon historical and literary knowledge. In fact, they go much further than this, often including musical notation, illustration, maps, physiological explorations, depictions of animal behaviours, understandings of soils, water and geological formation. They are, in a historical sense, polymathic. They depend upon an interdisciplinary analysis to draw out from them the multiple knowledge they contain. To recognize this of the objects of study is to offer a much better answer to the question posed in this section. The application of different disciplines and methodologies to the study of natural sound tells us that the documents in which historical natural sound has been curated are not only worthy of an interdisciplinary approach but that interdisciplinary research is crucial to unlocking them.

Working collaboratively, that is as a multidisciplinary as well as an interdisciplinary team, was crucial to the project we set out to complete. That is revealed particularly in the two joint articles included in this special issue, which foreground, first, the importance of the Romantic influence on listening that we identify throughout our longer period and, second, the significance of new forms of digital research in sound studies.

Listening in the Romantic period is the focus in the opening article, where Castell focuses on the work of a single poet: William Wordsworth. He considers several examples of listening in Wordsworth's poetry and pays attention to how a reader might listen to them, focusing especially on the formal qualities of verse that records both the sounds themselves and the act of listening. In the process, his contribution not only draws significance from the sounds of nature and the forms of attention paid to them but also investigates the role of sound in shaping environmental awareness in a writer who has often been seen as central to the development of proto-environmental cultural attitudes and early conservation institutions. Castell concludes with the importance of recognizing the multiple layers of sounding and listening in both the poetic examples themselves and in their reception and transmission across history.

Another of the "great sound poets" (Paulin 37) of the Romantic period, John Clare, is the subject of the next article. Again, it is the granularity of sound that is at issue, although this time sound's association with place comes to the fore. Mackenney explores Clare's responsiveness to sound at a time of major upheaval, as the poet famously uprooted from his native Helpston to the fen-edge village of Northborough. Although Clare expressed a concern that nightingales never travelled so far as this flatter, fennier corner of Northamptonshire, the evidence suggests that Northborough

provided the poet with greater opportunities to see, hear and study this bird than ever before. As the nightingale appeared to have left the Helpston woods to nest in the poet's orchard hedge at Northborough, its familiar notes vividly recalled memories of Clare's boyhood even as they heightened his awareness of change and deepened his feelings of homesickness. In ways that might be said to foreground a more modern experience of listening, Clare in his poems reflects on and works through the complex feelings enkindled by hearing an old familiar song in a new and changing environment.

The first of our jointly-written articles follows (Castell and Mackenney). It considers the early years of the historical period that gave the project its boundaries. It explores how both soundscapes themselves and our ways of listening to them have changed since the later eighteenth century (consideration falls specifically on the Romantic literary period). Following the first two articles, it focuses especially on how modes of Romantic listening were both changing and responsive to changes in the environment in the period. It considers a surprisingly broad range of sounds in Romantic literature and charts the continuities and discontinuities between Romantic approaches to soundscapes and our own. In the process, it draws out strands of Romantic influence on environmental thinking as it developed over the nineteenth, twentieth and twenty-first centuries, before finishing more experimentally with an example of continued Romantic influence on acts of listening in its description of sound walks undertaken in the Lake District.

Further complexities of the effect of sound on the listener are taken up in the next article. In his contribution Willis moves us along the timeline to the mid-nineteenth century and looks at the soundscapes of Elizabeth Gaskell's fiction. Gaskell has been largely understood as a commentator on urban industrialization. Yet her work on natural sound marks her as a writer with a clear environmental politics. In fictions such as her 1855 novel *North and South* and her 1864 novella *Cousin Phillis* Gaskell is concerned with the protection of the natural environment; a concern tied explicitly to the unique sonorous environments found only in nature. These, she shows, are therapeutic soundscapes with value particularly for offering psychic improvement or what we might now term better mental health. Gaskell was contributing to a view of natural soundscapes that was becoming more commonly expressed. By drawing attention to the therapeutic resonances of natural soundscapes and the importance of maintaining them, Gaskell contributes, with others, to emerging concerns about environmental preservation that later fed into the movement more consciously describing itself as environmentalist.

There is a change of emphasis in the next article, which considers contemporary research practices in historical sound research. Hardenberg and Hehl shift the focus from single authors and literary texts to investigate a methodological issue. Together, they explore how combining traditional research practices and digital methods (such as OCR and full-text search) can effectively contribute to analyzing the perception of past sounds of nature. In detail, the authors describe how the two approaches integrate with each other. While on one side initial source selection through full-text searches has enabled them to focus on individual texts using traditional historical methods, on the other close reading has allowed them to create a vocabulary of relevant search terms that has enriched and made digital search strategies more effective. This combined effort allows them to better understand period-specific emotional responses to natural sounds. Overall, the paper contributes to the broader concerns of the project: about environmental history, digital humanities, and the role of sensory experiences in shaping historical human-nature relationships.

These concerns are given specific shape in the final scholarly article. Hardenberg extends the temporal focus into the first half of the twentieth century by examining how thinking about natural sounds affected the development of nature conservation in Germany. Through analysis of conservation publications, he explores how the perception of natural soundscapes influenced the establishment of nature reserves across different landscapes, including mountains, heaths, forests, and the seaside. Hardenberg's analysis shows not only that early conservationists framed sounds in natural environments variably within a silence/sound/noise continuum but also how the aural dimension contributed to developing more comprehensive approaches to conservation. His article demonstrates how auditory appreciation of nature broadened environmental awareness and helped shape modern conservation practices, highlighting the tensions between preservation goals, tourism development, and human-produced noise.

To draw the issue to a close, the celebrated composer, musician and philosopher David Rothenberg, well known for his interest in the musicality of animal sounds, reflects on the evolution of methods for recording natural soundscapes in a brief Afterword. Writing personally, Rothenberg asks what is gained and lost in different sound recording practices. He concludes that only immersion in a soundscape can enable access to its full richness.

Taken as a whole, this special issue makes a significant contribution to the growing discourse which once again draws our attention to and celebrates the complexity and richness of the sounds of nature both as they are recorded by a range of actors in other historical periods and as their echoes continue to resonate in our time. Collectively the articles illuminate the project's central findings. First, that historic soundscapes are captured in rich and varying ways in textual form across the period from the late eighteenth century to the first decades of the twentieth century. Second, that this temporal range reveals an important continuity in the centrality of listening, even as practices of listening evolve. Third and finally, that keen, attentive listening is a necessary condition for the growth in environmental awareness, leading to increased efforts to conserve and protect the soundscapes of the natural world.

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