SILENT CITY: LISTENING TO BIRDS IN URBAN NATURE

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At half past four on a crisp July morning in 1952, a man could be seen leaning over the balcony of his room at the luxury London Savoy Hotel. Below his feet, the city was only beginning to wake up, but radio personality, broadcaster, and naturalist Ludwig Koch had kept himself awake all night. He had spent hours concentrating on the sounds coming through his headphones, and the long wait near his improvised recording studio had been interrupted only by quick glimpses across the balcony. Behind the legs of a cherub statue, the hotel management had found a nest of kestrel eggs—the high façade being an ideal habitat for the breeding pair. Realizing the opportunity, Koch now tried to record the sounds of the parents feeding their fledglings.

But through his earphones that morning, he heard no sound of a chick. "The noises of all kinds, including those of Waterloo Station, were deafening." By the time he stopped recording at ten o'clock, he had finally succeeded in recording its typical notes, luckily "clearly audible above the din of London." Nonetheless, the city had kept sounding through—with anything from the traffic noises below, to Big Ben chiming in the background—imposing itself on the ornithologist and future listeners to his recording.[1]

Although ornithologists have predominantly situated their inquiries in the rural landscape, the urban context serves as a preferred habitat for a plethora of avian species. As a result of birds adopting urban and industrial infrastructure such as canals, landfills, factories, and old buildings as their habitats, ornithologists have also been progressively inspired to redefine the boundaries between the rural field and the city.[2] These new spatial contexts, however, also presented the ornithologist with a social and material ordering that was substantially different from the traditional ornithological field-site. This ordering, as geographers, historians, and sociologists of science have repeatedly highlighted, has also had a bearing on the production of knowledge taking place in the city.[3] Recent scholarship has pointed out, for instance, that "how scientists chose their research topics and framed them conceptually; how they organized their research practices; and how they articulated and stabilized certain beliefs as valid scientific claims," has been affected by the city's socio-spatial setting.[4] But just as research practices have been affected by the spatial and temporal rhythms with which urban life unfolds, I propose, they have also been intricately textured by the sensory distractions and city acoustics that resulted from them.

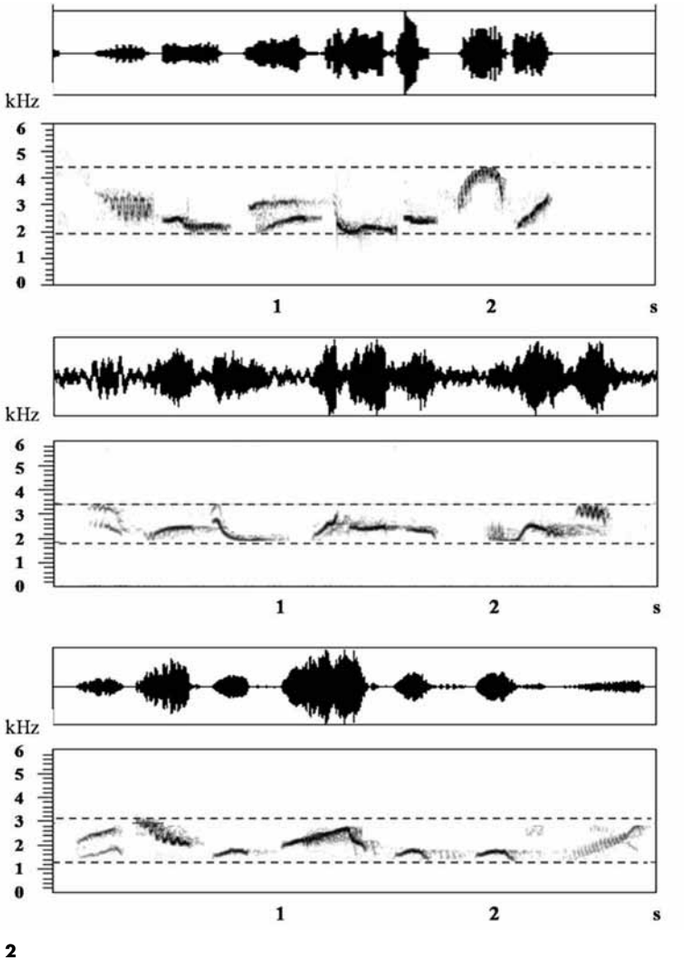
For Ludwig Koch, the urban context had long provided a familiar background for his observations and recordings. As director of the cultural branch of Electrical and Musical Industries Ltd[5] from the early 1930s, he had been well positioned to explore the new possibilities of electrical means of amplification and recording outdoors, while applying these in the production of a series of gramophone sound books on educational topics. Although Koch initially began recording commissioned soundscapes of German cities such as Cologne and Leipzig, he soon specialized in publishing natural history recordings. Intended both for a general public and scientific study on animal vocalizations, Koch produced these recordings in close collaboration with a host of prominent ornithologists and conservationists at

1 Ludwig Koch (left) with an improvised studio in the field. Photo by L. Lascelles Whitfield. Source: Ludwig Koch, Memoirs of a bird man (London: Phoenix House, 1955).

the time, collecting his material in the zoological gardens of major European cities such as Antwerp, Berlin, and London. Often situated in the centre of these cities, these zoos provided a space advantageously sheltered from the bustle on the streets, but with convenient access to power supply. As such, they allowed an improvised recording studio to be set up in close proximity to the animals. By the mid-1930s, however, Koch and his fellow pioneers in wildlife recording had also become increasingly concerned with the possible distortions that animal cages presented to their recordings, both with regard to their acoustical aesthetics and the naturalness of the animals' behaviour.[6] This had led them to progressively prefer the open air of city parks and gardens. Indeed, as field recordists at Cornell University pointed out, to enhance the fidelity of their recordings, bird vocalizations should not only be recorded outdoors but, during demonstrations, ideally also be played back outdoors, as the acoustics of a room might render a sound unnatural, or even unintelligible.[7]

But although such city parks seemed to provide a more "natural" setting for bird vocalizations to be studied and recorded in, they also required more flexibility of the recording engineer. Power supply was often short, with recordists depending on unreliable dry cell batteries or a noisy dynamotor to make their mobile studio run. Sometimes, these urban spaces provided new opportunities to exploit: Danish radio engineer Carl Weismann, for instance, set up his first recording outfits next to a railway ten kilometres from Copenhagen and used the telegraph wires to send the recording signal of a singing bird to a wax disc recorder in the Danish radio headquarters.[8] More often, though, urban nature presented the listener with small disturbances. On one occasion, for instance, Ludwig Koch had detected Crested Larks, *Galerida cristata*, which often resided around slag heaps and factories, at a Philips factory terrain. The noisy industrial activity at the location, however, only allowed him a very short window of night-time, between three and five a.m., during which the species could be recorded without much disturbance. In a similar vein, while observing local species in the parks of the Belgian Royal Palace in Laeken, Koch and his recording crew found themselves perturbed by the heavy background sound coming from Brussels, even though the town was located over three miles away: "The spots I had in mind proved impossible, and I had to seek others more sheltered from the waves of sound from the city."[9]

But even at a comfortable distance from the city, the rural field was never the acoustically pristine wilderness that it might appear. As another pioneering wildlife recordist in New York warned his readers, "… it is not as simple as it would seem to get a location where there is absolute quiet … Too great proximity to a traffic road, for instance, makes recording impossible."[10] Students of urban nature generally complained that their recordings were repeatedly interrupted by a passing airplane or turned out to be unfeasible because of the hum of a distant highway. Invariably, the fields, parks, and nature reserves where these ornithologists worked were bordered by urban infrastructure. Although often located several miles out of sight, its sounds often embraced listeners in the field. British conservationist Max Nicholson observed, for instance, that "just as smoke pollution helps to swamp a town



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under fog, so the natural peace of the country was drowned under the indefinable hum of distant engines and wheels." Noise abatement campaigns had taken off since the late nineteenth century, and between 1910 and 1940 became increasingly organized in cities such as London and New York. Clearly though, concerns with such "sonic exhaust" were never exclusive only to inhabitants of the metropolitan agglomeration.[11]

Along with its infrastructure then, urban sounds became fully, yet often initially imperceivably, entrenched within the landscape. This was not only due to obvious acoustic changes in the soundscapes of the mechanical age. It was also due to the increased sensitivity of mechanical equipment and recording instruments that recordists deployed in their service.[12]

2 Sonogram Example. A Blackbird in Urban, Periurban and Rural Settings. Source: Solange Mendes *et al.*, "Bird Song Variations along an Urban Gradient: The Case of the European blackbird (*Turdus merula*)," *Landscape and Urban Planning* (99) (2011).

Granted, even since the nineteenth century, ornithologists have had to negotiate their aural attention with other people and activities present. One naturalist listener in 1916, for instance, registered his frustration with "an energetic brass band with a particularly enthusiastic bass drummer, and a merry-go-round with the usual depressing music, traction-engine whistle and other noise producers."[13] But it was the electrical microphone, these recordists concluded, that amplified those sounds beyond their control. Even sounds that were hardly noticeable or simply too familiar to the human ear to stand out were picked up within a several mile radius and exaggerated. For example, American ornithologists at Cornell University quickly learned not to station their improvised field studio too close to power lines, as this would expose their recordings to an unpleasant electrical static that would render them useless. Other nature recordists learned to judge the urban landscape not only by what they heard for themselves, but also by the potential disturbances that it afforded. Far from a simple prosthesis for the ear, then, the microphone had begun to remediate and thereby restructure the urban soundscape, determining where and when one was able to listen and record.

The microphone drew attention to an acoustically complex habitat, in which the distinctions between urban and rural became progressively diffuse. But although wildlife recordists like Koch wanted to convey a sense of the singing birds' "natural" background, they were significantly less tolerant of interfering urban sounds. Whether their recordings were played back on low-tech consumer gramophones, broadcast over the radio, or reproduced on a visual film for scientific study, noise was found to diminish the recordings' intelligibility and pleasant consumption. As a result of such technical restrictions, these field recordists sought to balance their desire for the fidelity of an acoustically evocative setting with the demand for an attractively intelligible sound. Although their sound records were to capture the atmosphere of a natural scene as truthfully as possible, such records were still produced to be enjoyed by—and thus to privilege—the human listener.[14]

Reproducing the sounds of urban nature required considerable intervention. As media historian Jonathan Sterne has highlighted, the very act of recording always implies mediation and selection.[15] Koch and his recording team tackled the problem of interference by arranging up to six different microphones to enclose the bird's song perch. With each of these microphones linked to a control panel, recordists would hope to get as close as possible to the bird, to reduce interference by any background noise. Other wildlife recordists deployed highly directional types of microphones that amplified the sounds they were aimed at, "zooming in" on the birds. Permitting a far more selective recording, such microphones enabled recordists to capture the singing bird, and nothing but the bird, with minimal interference from its acoustic context. To the extent that regular microphones permitted at least the suggestion of immersion in a landscape, this was mostly offset by the close-up. These recording techniques provided a way to distil from the urban context a sonic landscape that was clear and tranquil, but also as free of urban disturbances as possible.[16]

Since the 1930s, this very concern with urban sounds as an aesthetic and analytic disturbance, and the preference for a close-up and sterilized aesthetic, has been crystallized in a variety of tools, techniques, and routines that ornithologists developed to record and analyze bird song. But by staging the experience of listening to birds as one that is devoid of urban interference, these field recordists not only acted upon an idea of what nature ideally should be, but in doing so also performed one. These recordings not only represented the city as an acoustic space, but also actively transformed it: moulding it into a private acoustic space fit for consumption and analysis. Building on anthropologist Steven Feld's notion of "acoustemology," Paul Greene and Thomas Porcello proposed the term "techoustemology" to foreground the implication of technological mediations of sound on individuals' knowledge and interpretations of, sensations in, and consequent actions upon their acoustic environments.[17] It alerts us to the ways in which these recordings enacted, suggested, and perpetuated a specific listening experience. They did so not just for these field recordists themselves. Through their circulation on commercial gramophone records, they also did so for a large group of other listeners—scientists, amateur birdwatchers, a general audience.

Grasping the extent to which such recordings came to filter urban nature provides one compelling way of understanding how biologists' investigations of the aural ecologies of the field privileged the natural over the technological and deeply human. Even despite, and often in spite of, ornithologists' and recordists' continuous immersion in, and annoyance with, interference by anthropogenic sound.

Such techoustemologies are not, however, inexhaustible and may be combined with other ways of listening, other ways of knowing. In 2003, the Dutch ecologist Hans Slabbekoorn and his colleagues at Leiden University published a paper in *Nature* that seemed to signal a remarkable behavioural adaptation of birds to their environments.[18] The authors observed that the ongoing spread of urban areas, highways, and airports throughout the world made anthropogenic noise virtually omnipresent. And such sounds, they found, created new selection pressures for birds. Slabbekoorn and his co-author Margriet Peet had studied groups of urban Great Tits, *Parus major,* in much the same way as their colleagues had done before them; they sampled their songs using a highly selective microphone, but they had combined this conventional technique with an omnidirectional microphone that allowed them to record, on a different channel, the city noise levels they previously had sought to eliminate. Slabbekoorn's study found that passerines that live in noisy urban environments generally sing with a higher minimum frequency than the same species living in a forest environment where there is significantly less anthropogenic noise. This, the authors proposed, suggested that the species adapted its vocal repertoires to a higher-frequency range in order to prevent its song from being effectively masked by low-frequency noises. Such interfering noises, bio-acousticians had begun to suggest elsewhere, made signals more difficult to detect or recognize by birds.[19] This has been recognized to constitute a competition for "signal space" between species. If its song would be structurally disguised by other sounds, this would give

the birds a serious evolutionary disadvantage; after all, the bird would be less successful in using its song to defend its territory or attract a mate.[20] In the wake of this paper several other studies began to consider the urban, not just as an acoustic backdrop, but as a factor shaping birds' singing behaviour.[21]

Far from artificially segmenting and separating this behaviour from its original habitat and acoustic context, then, this research has begun to acoustically inscribe the bird in the city and vice versa, the city in the bird. Although Slabbekoorn's multichannel listening and recording technique still aimed to provide the urban listener a detached, privileged control over the soundscape rather than the turbulence of immersion, this approach also opens up a first step, a cautious reflection on the city as a shared space, physically as well as acoustically, where anthropogenic and biological sounds may begin to resonate with and into each other. Listening in such a way is to open up to and bring in contact the heterogeneous realities surrounding us, and to attend to the complex ecologies within which signals are broadcast, received, manipulated, impeded and, sometimes, exchanged.

Endnotes

1 Ludwig Koch, *Memoirs of a Birdman* (London: Phoenix House, 1955) p. 166.
2 For more on urban ecological science, see Jens Lachmund, "Exploring the City of Rubble. Botanical Fieldwork in Bombed Cities in Germany after World War II," *Osiris* 18 (2003): 234–254. For more on ornithology in relation to the urban environment, see Raf de Bont, "Poetry and Precision: Johannes Thienemann, the Bird Observatory in Rossitten and Civic Ornithology, 1900–1930," *Journal of the History of Biology* 44, no. 2 (2009): 171–203.
3 See David Livingstone, *Putting Science in Its Place: Geographies of Scientific Knowledge* (Chicago/London: The University of Chicago Press, 2003); and A. Ophir, Steven Shapin & Simon Schaffer, "The Place of Knowledge: The Spatial Setting and Its Relation to the Production of Knowledge," *Science in Context* 4 (1) (1991).
4 Sven Dierig, Jens Lachmund, and J. Andrew Mendelsohn, "Introduction: Toward an Urban History of Science," *Osiris* 18 (January 1, 2003): 1–19.
5 The company was formed by a merger of two of the largest record companies: Gramophone Company, which had been established by Emile Berliner, the inventor of the gramophone; and the American Columbia Phonograph Company.
6 Edward Max Nicholson and Ludwig Koch, *More Songs of Wild Birds* (London: H. F. & G. Witherby, Limited, 1937).
7 Albert R. Brand, *More Songs of Wild Birds* (New York: Thomas Nelson & Sons, 1936) p. 30.
8 Interview with Carl Weismann, by Patrick J. Sellar (March 28, 1983). British Library C90/02/01.
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10 Albert R. Brand, "Recording Sounds of Wild Birds," *The Auk* 49 (4) (October 1, 1932): 436–439.
11 See for instance David Matless, "Sonic Geography in a Nature Region," *Social & Cultural Geography* 6 (5) (2005): 745–766.
12 Karin Bijsterveld, *Mechanical Sound. Technology, Culture, and Public Problems of Noise in the Twentieth Century* (Cambridge: MIT Press, 2008).
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17 Paul D. Greene and Thomas Porcello, *Wired for Sound: Engineering and Technologies in Sonic Cultures* (Middletown, CO: Wesleyan University Press, 2005).
18 Hans Slabbekoorn and Margriet Peet, "Ecology: Birds Sing at a Higher Pitch in Urban Noise," *Nature* 424 (6946) (2003): 267.
19 Ulrike Langemann, B. Gauger, and G. M. Klump, "Auditory Sensitivity in the Great Tit: Perception of Signals in the Presence and Absence of Noise," *Animal Behaviour* 56 (3) (1998): 763–9; R. H. Wiley and D. G. Richards, "Adaptations for Acoustic Communication in Birds, Sound Transmission and Signal Detection," in *Acoustic Communication in Birds, Vol. 1. Production, Perception, and Design Features of Sounds*, ed. D. E. Kroodsma and E. H. Miller (New York: Academic Press, 1982) pp. 132–81.
20 Slabbekoorn and Peet, "Birds Sing at a Higher Pitch in Urban Noise."
21 H. Brumm and D. Todt, "Noise-dependent Song Amplitude Regulation in a Territorial Songbird," *Animal Behaviour* 63 (5) (2002): 891–897; Jeffrey Cynx et al., "Amplitude Regulation of Vocalizations in Noise by a Songbird, Taeniopygia Guttata," *Animal Behaviour* 56 (1) (1998): 107–113; Paige S. Warren et al., "Urban Bio-acoustics: It's Not Just Noise," *Animal Behaviour* 71 (3) (2006): 491–502.

SONIC ECOLOGY: THE UNDETECTABLE SOUNDS OF THE CITY

Kate Jones

It is one of those balmy late summer evenings and the last rays of city sunlight reflect off the surface of the boating lake in London's Regent's Park. It is an absolutely perfect spot to investigate the sounds that the city can't hear. The group of people gathered around me on the lake's edge have come to listen to bats. However, as bat calls are too high for most people to hear, the group are relying on me to somehow reveal this sonic secret world.

Bats are surprisingly good city dwellers and have been reported in some of the most urban of city parks—New York's Central Park, and this evening's Regent's Park being just some examples. Although many people have negative perceptions of bats, bats are mammals just like us, and act as important pest controllers for many insects, including mosquitoes.[1] Bats have evolved flight by modifying their hands and spreading their fingers to form wings, enabling them to expertly navigate a variety of landscapes from lake surfaces to dense vegetation. Many species have also evolved sophisticated sonar systems to help them navigate and find food, which is especially useful when hunting aerial insects in the pitch dark. This "echolocation" system works by bats interpreting echoes as their calls bounce off objects, and then calculating exactly what and where things are.[2]