Acoustic Ecology and Ethical Listening

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While I was walking alone in the Amherst College Wildlife Sanctuary in Amherst, Massachusetts, I had a startling encounter. Without warning and from about twenty feet behind me, a dog barked. It was a single, short, sharp bark—the kind that my dogs make under their breath—a grunt as if to say, "Alert! Who's that? Listen." We humans make a similar sound when surprised. But this sound seemed to come from nowhere. I turned around, heart pounding and . . . no dog. No coyote either, nor a wolf or any other creature. Weird. What did I hear? The sound was certainly real enough to startle me. I looked toward the spot from where I thought the sound originated, judging from its timbre, loudness, and directional characteristics. No one there. I was still alone with the trees and plants. Perplexed and a little spooked, I scanned my surroundings for the phantom. With my ears and eyes trained and focused, and my heart still pounding, I tried to make sense of the scene, lest fear get the better of my imagination. I was standing in a small clearing amongst tall pine trees. The day was cloudy and gray. The tree canopy was swaying with the wind. That was the only sound: the stately ebb and flow of waves of wind passing through the conifers.

Differentiating between the ground and the moving things above it (leaves and branches swaying in the wind), I observed no shadows of birds or small mammals either. Just me, the wind, and the trees. Then, a minute later, I heard it again. As I turned to face the source of the sound, I could tell it was not at ground level, where I would expect a ghost dog to be, but emanating from above. I looked up. I noticed that the tall straight trunks of pines were not all growing perpendicular to the ground. Some of the trees were partly uprooted and leaning against each other. Soon enough, when the wind velocity and direction were just right, I heard it again. Then I understood. The mysterious sound was a frictional noise at the point of contact between two of the trees, producing a resonant sound with a pitch and timbre that matched that of an animal voice, human or otherwise. I was

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reminded of similar sounds I make myself with a cello bow, rubber balls, and pieces of wood, all amplified with a piezo disc contact microphone inside my self-built instrument, the Springboard.[1] With this ghostly "bark" demystified, I remember being struck by how marvelous it was that the tree's bark could actually "bark." I usually avoid anthropomorphizing non-human phenomena, but this experience affirms for me that the woods really do produce uncanny sounds that lie within the vocal range of animals and humans, creating a "voice of the forest."

I share this simple story to highlight three points. One, the importance of listening and how an awareness of sound can transform one's relationship to place. Two, my sonic misidentification and correction serves as an example—one among many—of how aural experiences can be difficult to translate into words. These experiences often remain unarticulated and therefore underappreciated. Three, human relationships with animals and nature depend on listening. In fact, hearing is one of our most valuable senses, which is much more pronounced in many species than in humans.

Canadian electro-acoustic composer Barry Truax has suggested that if we are to find ways to listen effectively, we need to develop an ethic of listening that is particularly relevant to the understanding of the lives of other species. In developing such an ethic, it is important to draw a distinction between *hearing* and *listening*. The former is sensory, while the latter involves active, conscious, and, at times, interpretive hearing. We should also bear in mind that levels of attention paid in listening are variable.[2]

Canadian composer, author, and music educator R. Murray Schafer pioneered a listener-centered approach to the acoustic environment in the late 1960s, objectively studying all aspects of the sonic environment, or soundscape. His fellow researcher and pioneering composer Hildegard Westerkamp concurred that the focus of this approach "was not on 'fighting noise' but on gaining knowledge and understanding of the soundscape as a

[1] The Springboard is an experimental instrument I built in 1994 to explore the sonic potential of coil springs and other readily available materials. The weak vibrations of these materials are effectively amplified by a single piezo disc contact microphone. When played with cello bows and homemade friction mallets, it is possible to produce extraordinary sounds that belie the humble origin of these materials. For more information visit: ericleonardson.org/instruments/.

[2] Barry Truax, *Acoustic Communication*, 2nd ed. (Westport, CT: Ablex Publishing, 2001).

whole, its meanings, its behaviour, and all living beings' behaviour within it."[3]

In order to create a focus on listening to and also for the sonic environment, Schafer founded the World Soundscape Project (WSP)[4] in the late 1960s and early '70s at Simon Fraser University in British Columbia. Its purpose was to study the role of sounds in their context, how various human-caused "noises" are ignored even as they influence everyday life in a changing environment. With a team of six researchers, Schafer coined many new terms for the diversity of acoustic phenomena. Included among them was the important and now popular, though often misunderstood, term "soundscape," which encompasses all sounds happening around us wherever we are. A deeper understanding of its meaning reveals a systemic set of interrelationships in which sound mediates between listener and environment. Other terms and concepts comprising Schafer's vocabulary include "soundmark," "signal," "keynote," "clairaudience," "acoustic horizon," and "hi-fi" versus "lo-fi," among others.[5] To redress the Western visual bias of the English language, the invention of these new and workable names helps to identify various unseen and ephemeral sounds so that they can become tangible, comprehensible, and memorable.

The work of WSP fostered a new approach to sonic understanding whereby sound is no longer conceived as only a musician's or acoustical engineer's concern. Rather, sound becomes *everyone's* concern.[6] Schafer's

[3] Hildegard Westerkamp, "Editorial," *Soundscape: The Journal for Acoustic Ecology* 1, no. 1 (Spring 2000): 4.

[4] www.sfu.ca/sonic-studio/handbook/World_Soundscape_Project.html, accessed January 16, 2015.

[5] The first primary resource for definitions of these and other related terms, including "soundscape," is R. Murray Schafer, *The Tuning of the World*. See note 7.

[6] When Schafer and the WSP team embarked on their study, it seemed that only composers and musicians were trained to understand the inner content of sounds and how they function on subjective and aesthetic levels. In the past forty years, that awareness has shifted. Today, engineers and people in disciplines that had previously focused solely on objective aspects of sound in the environment are increasingly recognizing that, while sound is inextricably connected with the physical world, aesthetic qualities of sound play significant roles in determining the health of human and non-human life. Because of its role in communication beyond music, the social impact of sound and environment is also more readily acknowledged now.

The Tuning of the World,[7] initially published in 1977, became the first major resource in this emerging field of sonic studies. The work, variously published and ultimately renamed *The Soundscape: Our Sonic Environment and the Tuning of the World* in 1993[8], defines these prominent new terms and provides a new vocabulary for this area of study. *The Tuning of the World* served as the summation of WSP's research, garnering international attention and becoming the seminal text in this new field. Of particular importance was Schafer's proposal that the complexity of a soundscape is not merely a consequence of various phenomena in action, which we can passively enjoy or endure. Rather, he argued that we are co-creators of the soundscapes we inhabit; often unaware, but nevertheless actively altering the soundscape, whether in a remote wilderness or a densely populated urban center.

The Tuning of the World prominently introduces "acoustic ecology"[9] as the study of relationships mediated through sound between listener and environment. This begins with listening, and concerns sound making in context, i.e., not in a laboratory but in situ. Schafer proposes "acoustic design," a newly minted "interdiscipline" that unites social, artistic, and scientific concerns in its study of the environment.

The second major resource in sonic studies, appearing in 1978, was *Handbook for Acoustic Ecology.*[10] Edited by Barry Truax, a member of the WSP's research team, the *Handbook* acts as a compendium of terms describing sound in the fields of acoustics, communications, linguistics and music, among others. While Schafer's *Tuning of the World* and subsequent books are inspirational and required reading for anyone interested in social, aesthetic, and scientific aspects of sound, the *Handbook* adds the terms coined by WSP and Schafer to the established lexicons. It remains a useful technical reference for students, teachers, researchers, and anyone else

[7] R. Murray Schafer, *The Tuning of the World* (Toronto: McClelland and Stewart, 1977).
[8] R. Murray Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World* (Rochester, VT: Destiny Books, 1993).
[9] Schafer, *Tuning of the World*, 205.
[10] *Handbook for Acoustic Ecology (The Music of the Environment Series, No. 5)*, Barry Truax, ed. (Vancouver: A.R.C. Publications and The World Soundscape Project, 1978). A CD-ROM version of the *Handbook* is included with sound examples in *Acoustic Communication,* 2nd ed., 1999.

seeking to delve deeper into sound and soundscape studies.[11]

Forty years after the introduction of acoustic ecology and acoustic design,[12] the global movement spawned by Schafer and the World Soundscape Project has branched off into various new, though related, directions. Acoustemology (acoustic epistemology), ecomusicology, ecoacoustics, and landscape ecology are but a few. The first international conference on acoustic ecology, also called "Tuning of the World," took place in August 1993 at the Banff Centre in Alberta. At this auspicious event, the World Forum for Acoustic Ecology (WFAE) was founded in response to the global interest created by Schafer's work. At Banff 1993, esteemed ethnologist Steven Feld and American experimental composer Pauline Oliveros were active participants, drawing their respective fields into the wider work of WFAE and acoustic ecology. Oliveros, one of the few female pioneers of electronic music, is also founder of the Deep Listening Institute for the therapeutic and developmental practice of listening awareness,[13] serving as a logical extension of the WFAE's work.

In the early 1990s, the Internet played a very minimal role in WFAE communications. However, several years later, with increasing Internet presence, the acoustic environment rapidly transformed into the global, electroacoustic "mediascape" that is now a reality. In 2008—15 years after WFAE began—I was among a small group called the World Listening Project. Because of the Internet we now had the means by which we could realize our ambitious aim of collecting and presenting field recordings from around the world. Later, we started the annual World Listening Day, held every July 10 since 2010, engaging people globally in their listening of our world. Our outreach efforts gained support from Schafer, Oliveros, and an

[11] Truax builds upon this foundation in *Acoustic Communication*. With a basis in the social sciences, he elaborates on acoustic ecology with additional attention to the impact of digital technologies of communications and audio media. Composers frequently cite his attention to the practice of "soundscape composition," while for a broader public his book provides a bridge from Schafer's "listener-centered" focus to a community-centered one that addresses the inner and outer complexity of soundscapes and their conscious design, considering both social and aesthetic needs.

[12] Schafer, *Tuning of the World*, 205.

[13] For background on Oliveros and Deep Listening, see www.paulineoliveros.us/about.html, as accessed January 16, 2015.

international host of artists, researchers, and activists.

Among the World Listening Project's biggest supporters is Bernie Krause, a student of Oliveros in the 1960s. Krause is an internationally recognized author, musician, former member of Pete Seeger's folk band The Weavers, bio-acoustician, naturalist, and advocate for saving endangered natural soundscapes. His records and film scores are noteworthy and popularly recognized. Nearly 50 years ago, Krause traveled the world, recording nature sounds or "biophonies," amassing a vast archive of 4,500 hours of recordings documenting some 15,000 identified life forms.[14] In addition, his holistic theory of biological environments attests to his work as an artist and scientist who draws inspiration from Schafer's listening ethic. Krause's latest book, *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places,*[15] has received positive critical and popular recognition.

In 2009, I asked Krause to write a vision statement for the World Listening Project. He immediately responded with this statement:

> A few remaining societies in our vast world know how to listen. It is an inherent part of their existence. One in which the received soundscapes of the forests, high plains, deserts, mountains, and coastal regions combine seamlessly with the visual, olfactory, and tactile senses. In some tropical regions dependence on acoustic perception supersedes that of all the others. Natural soundscapes serve as inspiration for their song and dance. It heals them physically and spiritually. Western society bases most of what it hears, or what it knows, on the visual. We actually hear what we see. The World Listening Project aims to transform that perception in our otherwise urban-centric and abstracted lives. At a time when we are facing not only a silent spring but a silent summer, fall, and winter as well, it is clear that where a picture is worth a thousand words, a soundscape may soon be worth a thousand pictures.[16]

[14] www.wildsanctuary.com, accessed January 15, 2015.

[15] Bernie L. Krause, *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places* (New York: Little, Brown and Company, 2012).

[16] Personal e-mail, June 3, 2009.

Krause's notion that "a soundscape may soon be worth a thousand pictures" is worthy of deep consideration, and is consonant with Schafer's tenet that humans tend to privilege visual experience over aural sensation and knowledge. But can these words lead to sound? Try to just listen, if you can. Now. Sounds are all around, and the sounds go 'round and 'round. What do you hear? The near, the distant, the barely audible . . . the "bark" of two trees? There are new worlds awaiting active listeners.[17]

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[17] An earlier version of this article appeared on the Center for Humans and Nature website, www.humansandnature.org/blog/acoustic-ecology-ethical-listening, accessed November 10, 2014. Permission to use this material was granted by the editor, Gavin Van Horn.