

TUNING IN AND SPACING OUT:

Notes on the Presentness of Sound

Edward Shanken

VU UNIVERSITY, AMSTERDAM

Yolande Harris

ORCIM RESEARCH INSTITUTE, GHENT

ABSTRACT

"These are underwater sounds made by humpback whales as they pass near Bermuda in the Spring. They were recorded through a hydrophone, which is a kind of underwater microphone. The water is very deep and the sounds are echoing off the under-surface of waves and from the submarine canyons and ridges on the island slope. If you listened for a long time you would hear that the sounds are organized into definite repeating patterns, so we call them songs, just as we refer to bird-songs or frog-songs. Unlike bird songs, humpback songs are very long, six to thirty minutes, and are strung together without pauses between them. They are probably the longest, loudest and slowest songs in nature" (Payne and McVay, 1970).

The first images of Earth from space and the first publicly released recordings of whale songs were widely disseminated and had a profound effect on popular consciousness on a global scale. The Earth from this perspective seems precious and coherent yet isolated if not vulnerable in space, one of many planetary bodies in the universe. The whale songs revealed these mythic beings as far more intelligent, sociable, and complex, but also far more accessible, far more humanlike, than previously recognized. This tuning in to the sound of whales and spacing out on Earth emerged at a moment of rising environmental concerns and contributed to a growing ecological awareness. Borrowing from cybernetics and systems theory, this awareness recognized the intrinsic interrelatedness of various life forms and the Earth's seas, terrestrial environments, and atmosphere. It appears that popular concern with environmentalism and ecology is cyclical in nature. And we are currently in the midst of another such cycle of heightened awareness, in which the whale returns again, as a central icon, and in which systems thinking underlies current conceptions of sustainability.

This paper purposely ambiguates the roles of the artist and theorist, flowing between scholarly writing and first-hand accounts of personal experiences. It discusses historic and contemporary research on sound by artists and scientists including La Monte Young, Alvin Lucier, Yolande Harris, David Dunn and James P. Crutchfield, and Michel André. The authors share a fascination with sounds from environments that lie outside direct human experience – under water, in the atmosphere and outer space, and at non-human spatio-temporal scales. These environments often do not lend themselves to visual discernment; rather, sound becomes an invaluable means for understanding these spaces, for experiencing a form of "presentness" in them. By presentness we mean a heightened personal

state of being – a psychical form of "tuning in" in which awareness of one's immediate or extended environment is greatly enhanced, expanding consciousness outward from the self into an infinite metaphorical space. We see this operation as underlying the power of field recordings and other forms of acoustic soundscapes. Tuning in and spacing out to the presentness of sound becomes a method for creating an expanded, systemic awareness that is key to cultivating sustainable attitudes toward the environment and to developing interdisciplinary solutions to global ecological problems.

Introduction

The first images of Earth from space and the first publicly released recordings of whale songs were widely disseminated and had a profound effect on popular consciousness on a global scale. The Earth from this perspective seems precious and coherent yet isolated if not vulnerable in space, one of many planetary bodies in the universe. The whale songs revealed these mythic beings as far more intelligent, sociable, and complex, but also far more accessible, far more humanlike, than previously recognized. This tuning in to the sound of whales and spacing out on Earth emerged at a moment of rising environmental concerns and contributed to a growing ecological awareness. Borrowing from cybernetics and systems theory, this awareness recognized the intrinsic interrelatedness of various life forms and the Earth's seas, terrestrial environments, and atmosphere. It appears that popular concern with environmentalism and ecology is cyclical in nature. And we are currently in the midst of another such cycle of heightened awareness, in which the whale returns again, as a central icon, and in which systems thinking underlies current conceptions of sustainability.

Tuning in and spacing out comprises a field in which sound enables a focused presentness that links the internal and the external, joining the individual human consciousness with a larger field of consciousness that is not anthropocentric much less geocentric. Along these lines, La Monte Young realized that "sounds and all other things ... were just as important as human beings and that if we could ... give ourselves up to them ... we enjoyed the possibility of learning something new..." Paralleling Bachelard's (1994) assertion of an infinite world accessible through daydream, Young claimed that by submitting to sound on its own terms, one could "experience another world ... [bounded only by] ... the limits each individual sets for himself" (LaBelle, 79-80). Indeed, in Young and Zazeela's *Dream House* we experienced a sublime sense of presentness in a sound-space that is at once subtle and overwhelming. It induces a highly meditative state if one 'gives oneself up to it' as Young proposes.

This sense of tuning in - submitting or giving ourselves up to – cannot be controlled like a radio dial selecting precise frequencies. It is more like falling in: falling in love, when one is so utterly and uncontrollably infatuated and sensitive to another being that their reality becomes one's own; falling into the belly of the whale, like Jonah being consumed by a beast that is at once horrific, yet womblike, the vehicle of his demise but also his rebirth. Indeed, many of the narratives pertaining to ecology and to whales straddle the poles of utopian daydreams and dystopian nightmares, and parallel deep mythic structures of apocalypse and resurrection, in which the failure to tune in results in an inevitable fading out.

Surface - Fishing For Sound

Santiago, the Cuban fisherman in Hemingway's *The Old Man and the Sea* (1952), knows his surface environment, the boat and weather. He knows the underwater environment beneath his boat by the signs he reads from the surface - birds, currents, weed, shoals of fish, the other fishing boats. As the story develops he extends his senses underwater by literally feeling the behaviour of the giant marlin, through the touch of his fishing lines on his hands, his fingertips, and later, his back as it tows him through the sea for three days and nights.

Submerging into a sea of sound, it surrounds, immerses my hearing and my being. Underwater I am out of my element, in a medium in which I cannot survive without technical aids and only for limited periods of time. What does it mean to relate to such an environment through sound?

I try to identify by listening, I listen to myself suspended, floating in liquid. The sound is like the liquid. And I can pull sounds out, fish for them.

Like Santiago in Hemingway's novel, I can catch my sounds from the surface, I can know something of what is down there, through my technology I can listen and by learning sounds and signs from the surface I can understand another medium.

In *The Pink Noise of Pleasure Yachts in Turquoise Sea* (2009-10) Harris explores the relationship between sound and image, making audible the inaudible by "fishing" for otherwise imperceptible underwater sounds, and simultaneously presenting a visual corollary. Suspended over and casting a shadow on the floor projection, a pair of headphones dangles like tackle on a fishing line, inviting the viewer to become a listener. While the sun refracts brilliant pink light that dances on the gentle, turquoise waves, high-powered marine engines under this Elysian surface generate otherworldly sounds (including pink noise). Although the sound waves generated by marine engines are literally present in the sea shown in the video (sadly, a national marine sanctuary in Spain), they cannot be heard without an underwater microphone (hydrophone) with which the artist recorded them, and a sound system to amplify and reproduce them. In *Pink Noise* we simultaneously see the sea as it visible to our own eyes from above it while we witness what dolphins and other sea animals hear beneath it, including the intense sonic impact of humans on the underwater environment.

Underwater

The assumption that underwater is silent has been turned on its head in the last decades as scientists begin to understand just how crucial sound is to aquatic life, in a largely dark environment where sound is used to detect motion, currents and prey, and to communicate. Bio-acoustic scientist Michael Stocker states, "while considerable efforts are being made to understand the auditory perception of sea animals, our understanding is miniscule compared to the vast diversity of sea animals and their adaptations to sound." (18).

It is not yet known what effect changes in the sonic ecology through anthropogenic sound (from human sources)

may have on marine organisms and the larger underwater ecology. Marine bio-acoustic scientist Michel André clearly identifies the problem and suggests that research on cetaceans offers a particularly fruitful line of inquiry into the sustainability of marine ecosystems. He considers them as "bio-indicators of the acoustic balance in the oceans" (2010, 43). Tuning in to how marine mammals perceive their environment through sound and attempting to understand their communication methods will offer crucial insights into the conservation and sustainability of marine ecosystems.

Whales are mammals that breath air, but live underwater. This connection between air and water, between whales and humans, is part of our imaginative fascination with cetaceans, almost like a mirror of ourselves, acting as a bridge between these media. Despite popular fascination with the musicality of whale "songs," the variety of sounds whales make, to say nothing of how they make them, is not well understood. Cephalopods - octopus, squid, cuttlefish, the Kraken or Giant Squid (the 'Bloop'?) - are even more obscure to humans and yet equally mythical. However, most scientific research on cephalopods has focused on their function as food for whales, the "rock-stars" of the underwater world. André's recent research suggests that cephalopods are extraordinarily sensitive to sound, and experience 'acoustic trauma' - permanent physical damage to the hearing organ - at very low decibel levels. Exposure to repetitive, loud, anthropogenic sound may have drastic consequences for populations of cephalopods, leading André to suggest that such an imbalance in the underwater ecology may be capable of "impacting the entire web of ocean life" (André et al, 2011).

From Humpbacks to Quasimodo

Alvin Lucier's music composition *Quasimodo: The Great Lover* (1970) was inspired by the humpback whale's ability to send sounds over thousands of miles. Lucier transforms the "long-distance sound-sending ability" of cetaceans in water into an artwork that can "send sounds over long distances through air, water, ice, metal, stone, or any other sound-carrying medium, using the sounds to capture and carry to listeners far away the acoustic characteristics of the environments through which they travel" (Lucier, 318). In this way, *Quasimodo* provides an artistic model for human listeners to encounter a form of long-distance sound transmission and to experience how sound changes as it travels through various media.

Quasimodo consists of a chain of microphones and loudspeakers that passes from the first space where the sound begins, collecting sound that is transformed by each adjacent acoustic space and medium it travels through. The end result, at the final location of the chain, is a cumulative sound based on transfer over distance by means of alternating transduction of sound from electronic signal to sound waves reproduced and transmitted through successive spaces/media. Of her experiencing performing *Quasimodo* in 2009, Harris recalls that:

I was impressed by the quality of sound accumulation as one physically experiences it moving from one space into another. The work seems to simultaneously pose and answer questions pertaining to sound and space such as, what

happens when I walk across a threshold from one space into another? How do I sense that and what does it do to my understanding of changing qualities of space that would otherwise remain unconscious?

This led to the insight that sound enhances the other senses. I could see, feel and smell the differences between a room, a corridor, and an exterior space. By accentuating the acoustic properties of the spaces my attention to their specific characteristics and their differences was heightened. At the same time the directional long-distance sending of the sound through these proximate spaces enhanced an idea of continuity and forward motion, of passing thresholds, of accumulation, resonance and a relational consideration of the sounds. As I travelled through this long and varied distance, my body and senses activated by the piece, I could sound out the spaces and experience what happens between them, tuning in to the inextricable relatedness of sound and space.

Laura Cameron and Matt Rogalsky's *Transnational Ecologies 1: Sounds Travel* (2007), a networked performance of Quasimodo, set us daydreaming about the sea as an Internet for whales. But in the cetacean's underwater sonic network, participants convey their messages directly over vast distances, without any form of transduction. What is the presentness of sound for a whale? What might it be like to experience a form of direct communication over hundreds if not thousands of miles and/or across time? To intimately know one's position in space on three axes and the relationship of that position to the contours of a vast environment and to the location of others? Is this perhaps something that humans already do? Might we, as Young suggested, have a great deal to learn about this by "giving ourselves up to the sounds," by experiencing the presentness of sound as intensely as possible, and by better understanding sound that lies outside our auditory range and outside of terrestrial environments?

Satellite Sounders

In the 1970's Murray Schaffer, the founder of the Acoustic Ecology movement, was so appalled by the general inability to listen that he developed "ear-cleaning" techniques. Similarly, Harris's work strives to enhance hearing and to reveal the 'presentness' of humans and technologies within the environment. Over thirty years later, her *Sun Run Sun: Satellite Sounders* (2008) demonstrated how difficult it is for people to put everyday sound experiences into words. This work explores the relationship between the embodied experience of location and the calculated data of position. The *Satellite Sounders* are handheld custom-made instruments that allow one to listen to the changing satellite data while walking. They consist of a GPS antenna and receiver, a small Linux processor converting the data into sound, a rechargeable battery, and stereo headphones. A continuously changing musical composition is generated from signals of navigation satellites in orbit, together with the participant's coordinates on earth. By exploring the individual experience of navigation technologies through the intimate and immersive qualities of sound, *Sun Run Sun: Satellite Sounders* re-establishes and renegotiates a sense of embodied connectedness to one's environment. See www.yolandeharris.net

I was surprised and delighted by the responses to my sonified GPS data, listening to the satellites moving in and out of focus overhead while walking through the environment, any environment, city or sea. The sonification focuses attention

to the terrestrial sounds of one's direct immediate environment. Tapping in and listening to a data-source that is always there, in this case by sonifying it, expands one's self-conception to join terrestrial and extra-terrestrial scales.

Art and Science

Whereas the *Satellite Sounders* enable an expanded awareness of one's local environment through the sonification of satellite data sent from the Earth's atmosphere, the collaborative research of composer David Dunn and complexity scientist James P. Crutchfield does something like the inverse. By tuning in to the inaudible sounds of an animal the size of a grain of rice, they have created an expansive ecological awareness of global proportions.

Their work theorizes how the micro-ecology of insects, the Earth's forests, and climate change are inextricably linked. Their analysis takes a cybernetic, systems theoretical approach, in which an interconnected chain of feedback loops contributes to regional deforestation, which they believe is likely to expand to a global scale. Based on extensive field ultrasound recordings of bark beetles, they claim that bioacoustics plays a central role in the complex dynamics of infestation and may be a "critical link in the feedback loop" (239). Dunn and Crutchfield demonstrate how tuning in to the micro-acoustic world of insects can provide great insight into the dynamics of regional ecology and climate change on a global scale.

Similarly, by listening to and understanding sound production in the underwater environment, André has generated innovative solutions. For example, to deter dolphins from fishing nets, rather than emit 'warning sounds' that act as a dinner bell, the release of a screen of bubbles reflects the dolphins echo-sounding, acting as a sort of wall which they cannot hear/see past. Both Dunn and André have demonstrated success by integrating an interdisciplinary understanding of sound and the way it functions in a larger contextual frame, leading to applied interventions that approach problems not as isolated symptoms but as systems that demand systemic responses.

Such work calls attention to the fine line between art, science, and environmental activism. A line that is constantly present in research on the environment, regardless of one's field. We are presently in a stage of acute environmental awareness. The enormous complexities of interlinking systems that make up ecological balances challenge our ability to find and implement potential sustainable solutions. This situation demands re-conceptualizing and negotiating the boundaries of art, science and activism. Tuning in to sound, as a highly unregulated aspect of the environment, and particularly underwater sound, which is not well understood, holds tremendous potential for expanding systemic awareness. The challenge, as Young proposed, may lie in "giv[ing] ourselves up to [sound]" in order to "experience another world ... [bounded only by] ... the limits each individual sets for himself."

Works Cited

- André, Michel, M Solé, M Lenoir, M Durfort, C Quero, A Mas, A Lombarte, M van der Schaar, M López-Bejar, M Morell, S Zaugg and L Houégnigan. "Low-frequency sounds induce acoustic trauma in cephalopods." *Frontiers in Ecology and the Environment*, 2011: doi:10.1890/100124.
- André, Michel. "Cetaceans, bioindicators of noise pollution: understanding the changes of the marine environment." *Acoustique et Technique* 61 (2010): 43-46.
- Bachelard, Gaston. *The Poetics of Space*. Boston: Beacon, 1994.
- Dunn, David and Jim Crutchfield. "Entomogenic Climate Change: Insect Bioacoustics and Future Forest Ecology." *Leonardo* 42:3 (2009): 239-244.
- LaBelle, Brandon. *Background Noise*. New York: Continuum, 2006.
- Lucier, Alvin. *Reflections / Reflexionen*. Cologne: MuzikTexte, 1995.
- Payne, Roger and Scott McVay. *Songs of the Humpback Whale*. 1970, LP.
- Stocker, Michael. "Ocean Bio-Acoustics and Noise Pollution: Fish, Mollusks and other Sea Animals' Use of Sound, and the Impact of Anthropogenic Noise in the Marine Acoustic Environment." *Soundscape* 3:2 (Spring 2003): 16-29.

SAUTI YA WAKULIMA: LISTENING TO THE VOICES OF THE FARMERS IN TANZANIA

Eugenio Tisselli, Juanita Schläpfer-Miller, Angelika Hilbeck

INSTITUTE OF INTEGRATIVE BIOLOGY, CHN UNIVERSITÄTSTRASSE 16, 8092 ZÜRICH

ABSTRACT

This paper describes the framework and development of the e-agriculture project Sauti ya wakulima, "The voice of the farmers" in Swahili. The latest scientific findings acknowledge that in order to find a sustainable way of producing food in the future, it will be necessary to understand agriculture as a complex system which, besides economic and ecological factors, also includes the social context of rural farming communities. *Sauti ya wakulima* adopts this vision by establishing an open and participative research process, in which a group of farmers living near Bagamoyo, Tanzania, uses smart-phones and a web platform to document their environment, and create thus a collaborative knowledge base.

DEFINING THE FIELD

E-agriculture defines an emerging field in which information and communication technologies (ICT) are applied to the improvement of agriculture and rural livelihoods. The term was introduced as one of the key areas of application of ICTs in the Plan of Action of the World Summit on the Information Society (WSIS), celebrated in Geneva 2003. Mobile communication technologies are presently the main focus of e-agriculture. In Africa, where most of the development projects for agriculture are concentrated, Internet usage is still low, reaching about 13,5% of the population; yet it has grown 2.357% over the last ten years, almost five times more than the rest of the world (Internet World Stats, 2011). However, more than a third part of the population in Africa are cell phone owners, and this rate is growing fast (International Telecommunications Union, 2010).

The original definition of e-agriculture and its more recent applications, tend to consider agriculture as a merely economic-productive activity, whose purpose in rural environments is to provide food security and alleviate poverty. While these goals undoubtedly are crucial, agriculture should not be understood exclusively from an economic-utilitarian angle. The International Assessment of Agricultural Science, Knowledge and Technology for Development Report (IAASTD, 2009) argues in favor of a fundamental shift in agricultural knowledge, science and technology, towards the acknowledgment of the multi-functionality of agriculture, understood as the interconnectedness and complexity of agricultural systems within diverse social and ecological contexts. The report identifies a strong social element of food production, which includes health, gender, tradition, social structures, and culture. While improving productive efficiency and access to information in rural agriculture are certainly key areas in e-agriculture, ICTs can