Soundscape

VOLUME 7 NUMBER 1 | FALL / WINTER 2007

Art, Science, Environment, Activism

The Journal of Acoustic Ecology

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Soundscape is an English language publication of the World Forum for Acoustic Ecology (WFAE). It is conceived as a place of communication and discussion about interdisciplinary research and practice in the field of Acoustic Ecology, focussing on the inter-relationship between sound, nature, and society. The publication seeks to balance its content between scholarly writings, research, and an active engagement in current soundscape issues.

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WORLD FORUM FOR ACOUSTIC ECOLOGY (WFAE)

The World Forum for Acoustic Ecology, founded in 1993, is an international association of affiliated organizations and individuals, who share a common concern for the state of the world's soundscapes. Our members represent a multi-disciplinary spectrum of individuals engaged in the study of the social, cultural, and ecological aspects of the sonic environment.

BOARD MEMBERS OF THE WFAE AND ITS AFFILIATES

CONTRIBUTIONS

Ideas for journal themes, proposals for new sections, as well as visual materials, are welcomed. You may submit either a proposal or a complete manuscript of a potential article to Soundscape. The Editorial Committee would generally prefer to communicate with you beforehand regarding your idea for an article, or receive a proposal, or an abstract (contact information below). Please also download our Guide to Contributors: Instructions for the Preparation of Materials for Submission to Soundscape (PDF) on the WFAE Website at: http://www.wfae.net

Submissions. Texts can be submitted for the following sections in the journal: *Feature Articles*; *Current Research*: a section devoted to a summary of current research within the field; *Dialogue*: an opportunity for editorial comment from readers; *Perspectives*: reports of events, conferences, installations etc.; *Sound Journals*: personal reflections on listening to the soundscape; *Soundwalks* from around the world; Reviews: of books, CDs, videos, websites, and other media; *Students' and/ or Children's Writings*; *Quotes*: sound and listening-related quotations from literature, articles, correspondence, etc.: *Announcements*: of events organized/sponsored by the WFAE Affiliates.

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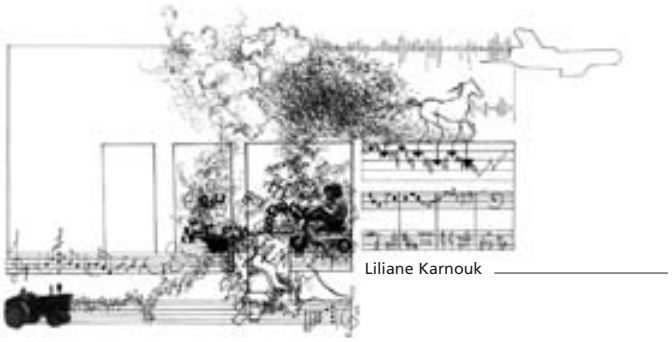
Liliane Karnouk

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On the cover: Steve Feld listens to and records the ocean's edge in Ghana, using in-ear binaural mics. This work contributed to the composition Anomabo Shoreline, available in The Castaways Project (http://www.VoxLox.net).

Editorial

Art, Science, Environment, Activism

Soundscape art has always had a couple of key themes near its center: to make explicit the patterns and changes in our sounding world, and to raise awareness about the state of the world, as revealed through sound. These two impulses are related to, but clearly distinct from, the roles of science and of environmental activism. In this issue of *Soundscape*, we are challenging the acoustic ecology community to dig a little deeper in these two directions, to consider ways that our work might contribute in more practical—and influential—ways to the work of scientists and activists.

Being primarily listeners and artists can tend to allow us to be satisfied with reflective or idiosyncratic approaches, as befits our personalities or predilections toward individually creative expressions. Yet in these times of global environmental challenges and the deepening chasm between scientific inquiry and the lives of "ordinary" citizens, might we find an equally compelling sense of purpose in creating sound art that reaches across the social and cultural divides? Where is the sound art that communicates to and helps ground scientists, or that speaks directly to the crises that call for widespread changes in our society's relationships with the natural world? How can sound art help both scientists and activists to grapple with these times? Beyond that, how can artists work in tandem with scientists and activists, or perform those roles themselves?

It is surprisingly difficult to find examples of sound art that proactively address science and activism in fundamentally engaged ways. Even those of us attempting to ground our work in the world around us are more apt to be satisfied with raising awareness on a scientific topic or environmental issue, while falling short of truly informing new insights or catalyzing new action. We want to be clear that we do not find fault with such works; indeed, every bit of new awareness and every opportunity to engage creatively with this world of ours is worth every ounce of effort expended. Our point is rather that these long-standing traditions of sound art can go even further. Our goal with this issue is to highlight some artists and projects that are pushing the edges, and in some cases truly breaking through to engage science and activism in new ways.

How can artistic insights frame questions about what science might look at and listen for? Is it possible for sound art to both present empirical scientific data in a way that can engage the public, and frame new questions or hypotheses that are worthy of further scientific investigation? David Dunn and Steve Feld are each attempting to bridge the divide between research scientists and soundscape composition; their efforts are explored in one of our feature articles. The lead Perspectives paper also digs deep in this direction, through the lenses of cognitive science and soundscape art.

Despite the obvious relevance of such sonic inquiries, it is remarkably difficult to find sound artists, or academic researchers, or artist/scientists like these two, who are cultivating this fertile ground. Of course, there is no absolute dividing line with which to assess how scientifically substantial a given sound art project is; an elegant composition centered on presentation of scientific data may well inspire a passing researcher to new insights, unbeknownst to the artist. Still, the search for sound art that truly frames scientific research in ways that can become part of the dialogue in the academic discipline it addresses is an enticing prospect.

The best of sonification projects can approach the level of diligence and relevance of this work; I think of Andrea Polli's long-term temperature trends piece, *Heat and the Heartbeat of the City* (http://turbulence.org/Works/heat), which provides a vivid experience of the changing local climate in New York City over the past and future decades. The gradual nature of changing climate, combined with natural annual variations, can make it difficult to be sure of our experience; Polli's piece, by stepping us through time a decade at a time, offers a concrete sonic experience of what is happening. Still, such work does not serve to advance the *study* of warming, or raise new questions for science to explore. Yet compelling sonification art

does begin to come alive in another important way: it is right on the cusp of sound art that inspires environmental activism.

The bar we are aiming for in regards to activism is once again set rather high: we are interested in sound art that moves beyond simply raising awareness, and actively engages people in the work of addressing environmental issues, ranging from soundscape preservation to habitat loss and systemic threats such as global warming. And again, there is no absolute dividing line, but rather a fuzzy continuum of sound works and artistic/activist vision, with the impact of a given project being, of course, dependent on the individual responses of people experiencing it.

In this issue, we feature project reports on three sound art projects whose activism was oriented toward engaging local people with their own local soundscapes, explicitly encouraging deeper connection with the place through sound. As you'll read, the implicit layer of fostering protection for the soundscapes or habitats varies among the projects, being strongest in the Icelandic and Panamanian projects, while Annea Lockwood's Danube Sound Map is more an exercise in encouraging listening to place and acknowledging historical resonances that remain audible.

Our feature interviews all address the activism theme to some degree. Peter Cusack's Dangerous Places project takes the activist approach to sound art in a compelling direction. By exploring the sonic beauty to be found in visually and environmentally devastated places, he highlights the discontinuities in ways that perhaps can only happen through sound. Nick Miller shares some of the successes and challenges facing those working to minimize the impacts of human noise on national parks and neighborhoods. David Dunn calls on artists to take up the challenges of our times, and create sound works that help give voice to an ailing planet. Emily Thompson calls for an understanding of the historical basis of our contemporary urban soundscape, to better appreciate where we've been and where we're going with it.

An underlying theme that courses through many of the features, project reports, and reviews in this issue, and that informs the core purpose of the issue, is the search for ways to make soundscape art even more relevant to the life of our communities and our planet. It is no longer enough to share our innovative compositional approaches or compelling sonic experiences among ourselves. The insights, the wisdom, the sensitivity of the sound art community, and the integrated synthesis that is possible through acoustic ecology's ways of listening to the world, can serve a much wider community. Dunn, Cusack, Lockwood, Miller, and the rest of the contributors to this issue all point to an exciting and expansive new landscape for us to be part of. We invite further dialogue on the themes raised in this issue, and hope that some exciting new soundscape compositions and installations will result in the coming years.

—Jim Cummings and Steven M. Miller, co-editors
cummings@acousticecology.org, smill@csf.edu

Online Audio Supplement:

This edition of *Soundscape* includes an online Audio Supplement, which features sound files associated with articles, as well as several pieces submitted by sound artists. The files may be listened to online or downloaded at the following URL:

http://soundscape.csf.edu

Report from the Chair

"On Friday, August 13th, 1993, over 100 delegates of the TUNING OF THE WORLD international conference on acoustic ecology formed a new international organisation, WORLD FORUM FOR ACOUSTIC ECOLOGY…" So reads Volume 1 of the conference proceedings. Some other interesting items emerge from within the notes of the Open Panel sessions that ran through the week as the assembled delegates dreamed and schemed.

At the first sessions the panel wanted to "receive suggestions about community and what will happen after this week." "This is a very complex community (from) diverse professional backgrounds and cultures. An emphasis must be placed on an open and broad form of listening across these delineations." Hildegard Westerkamp went on to discuss modes of communication using email for immediacy, bulletin boards, a Newsletter and an international journal. Murray Schafer suggested a format of "bi-monthly issues and a special 'yearbook' issue". Prophetic! People suggested forming an international society, continuing conferences and even a research group with established interconnections between research, artwork, and other disciplines.

With the formation of the WFAE and its subsequent re-structuring into affiliated groups in 1998 many of these dreams have become a reality. There were other issues raised in Banff that remain unresolved or perplexing: fundraising, "who will do the work?" and even more to the point, "who will continue the work?" Some of these were discussed at the WFAE board meetings in Japan last year. The most substantial determination from those meetings was the evolution of the Soundscape Journal editorial committee into a truly global enterprise. This Volume 7 of *Soundscape* is living proof that capacity and energy truly exists within the organisation and on behalf of the Board I extend our gratitude to Steven Miller, Jim Cummings, and the ASAE for their good work.

Communication remains a particularly difficult problem for the WFAE and Clemens von Reusner, the FKL representative, has established an online forum in an effort to facilitate board discussions beyond our email listserv. In practice this hasn't proved too successful yet; however, with effort it could work out in the future. Similarly, communicating via VOIP, webchat or other internet based systems need to be explored. As the delegates in Banff found, face to face meetings are invaluable and it is encouraging to read in the following reports of the ways each of our affiliates are actively engaging with their memberships. Indeed, the Tuning of the World delegates talked at length of the need to focus on regional activities while grappling with the concept of a centralised body for lobbying and fundraising.

The puzzling issue of what we do as a global collective is still with us today. The lack of a coherent answer to this question does not diminish our ability to carry out the mission set down by the founding members back in 1993. The organisation continues to grow and strengthen. We have just formally welcomed our newest affiliate, the Mexican Forum for Acoustic Ecology, who have ambitious and exciting plans including hosting our next major international conference in 2008. In November 2007, the Hellenic Society for Acoustic Ecology will also be launched.

As a group of nine affiliates we can now carry out our mission within a wider spectrum of communities geographically. And the enthusiasm of the assembly in Banff lives on in a multitude of forms with each affiliate organisation 'tuning in' to their own particular interests across the many disciplines of acoustic ecology.

— Nigel Frayne
Chair, WFAE Board, chair@ewfae.net

Regional Activity Reports

American Society for Acoustic Ecology (ASAE)

by Jim Cummings

The ASAE consists of a loose network of sound-oriented folks from around the United States. The ASAE sponsors a listserv, through which we share news about individual and chapter projects and exchange information and contacts to support each other's work. An occasional email newsletter also keeps us connected.

In 2007 and 2008, we hope to catalyze the formation of new chapters, since it is apparent that, given the geographical distances in the US, our national organization is best utilized as a networking venue for groups of people engaging regularly with collaborators in their home areas. We currently have active chapters in New York (http://www.nyacousticecology.org) and Santa Fe that host local events. There are also concentrations of acoustic ecology and sound art activity in the San Francisco Bay Area, Seattle, Chicago, and Boulder, which may grow into ASAE chapters.

A couple of national projects are simmering on the back burner, and with the emergence of individuals to stir these pots, could well become more active in the coming year. These include a Hundred Soundscapes project and an Endangered Soundscapes project.

More ambitious is the plan brewing to host an international WFAE conference in 2009. A planning committee will be forming by early 2008 to begin working toward this, and we will of course keep the international community informed. We invite readers of Soundscape who live in the US and are not yet connected with the ASAE to be in touch and become involved!

Contact: contact-asae@wfae.net
http://www.AcousticEcology.org/ASAE

Canadian Association for Sound Ecology (CASE)

by Nadene Thériault-Copeland

The mission of the Canadian Association for Sound Ecology (CASE) is to draw attention to unhealthy imbalances in the relationship between living organisms and their sonic environment (or soundscape) and to improve the acoustic quality of a place wherever possible as well as to protect and maintain acoustically balanced soundscapes where they still exist. As a multidisciplinary organization, CASE encourages and supports research into the aesthetic, ecological, philosophical, sociological and cultural aspects of the sonic environment. A special emphasis of research is placed upon sound ecology in Canada.

Contact: contact-case@wfae.net, http://www.acousticecology.ca

Soundscape Journal 2008:

The issue of Soundscape that you hold in your hands is the first to be produced under our new approach of having a different affiliate take responsibility for each year's edition.

In 2008, the FSAE will be taking the reins, and producing an issue with the theme of European Soundscapes. For information on contributing, contact: *info@akueko.com*

Australian Forum for Acoustic Ecology (AFAE)

by Nigel Frayne

The AFAE remains a small group. Over the years the membership size has fluctuated between 10 to 30 members, the latter being immediately following the Melbourne Symposium in 2003.

Being a very small group the actions of the organization will reflect the individual interests and capacities of the members rather than a central approach guided by a mission. This transfers to one of our members being very active in introducing and running soundwalks for different festivals and events throughout Australia. Others dedicate most of their time to administrating and running the WFAE. For the most part, as is likely for the other affiliates, most action occurs within our members' professional lives which have become 'infected' with the perspective of Acoustic Ecology. This includes members who are engineers in the professional audio and radio fields as well as sound artists and academics. The core group does still engage directly with each other at bi-monthly meetings to cross pollinate ideas and continue to explore the potential for running collective events such as seminars and site visits. So at this stage in the development of the AFAE, as it is for the 50 individuals who have been AFAE members over the years, we spread the word and create awareness about issues in the soundscape mostly through our daily professional lives.

Contact: contact-afae@wfae.net
http://www.afae.org.au

Finnish Society for Acoustic Ecology (FSAE)

by Simo Alitalo

The Finnish Society for Acoustic Ecology started as a professional organization. Its character has always been semi-academic and it has recruited the majority of its members from universities, art schools and polytechnic institutions. The members of the society have produced quite a few dissertations related to soundscape studies; several more are in the works and due to be published during the next few years.

We are aware of the narrowness of our membership base and we are working to broaden it in the future. Our aim has been to raise public awareness about the meaning of sound and the role of sound environments in our everyday life, as well as to advance the study of soundscapes. We also try to help to protect soundscapes and sound landmarks that local communities think are important.

In 2006 we published a book and a CD, "One Hundred Finnish Soundscapes". It was a result of a national collection of personal soundscape memories and sound recollections. I have described this project in more detail in previous reports (http://www.100aanimaisemaa.fi). We have now come to realize what an efficient method this kind of campaign is in advancing discussion about the past and future of our sound environments.

During years 2007–08 FSAE will start a similar project on a regional level. We will publish, jointly with Aamulehti (regional newpaper), soundwalk maps of the Tampere region. Our aim is to raise awareness about local soundscapes and also produce materials, ideas, and tools for environmental planning. The project will make

Finnish Society continued from page 3

use of the insights that were obtained during "One Hundred Finnish Soundscapes". It will consist of a website that contains sounds, memories, and impressions of sounds that have special meaning to local inhabitants. The website will also be a a part of The European Soundscapes in Transition project that is being developed together with Tampere Polytechnic and Joensuu and Tampere Universities.

During the year 2008 FSAE is aiming to organize one major international conference and/or Studia Generalia lecture series, depending on our funding situation. In October we will organize the annual Day of Silence jointly with The Finnish Association for Nature Conservation and The Finnish Federation of the Hard of Hearing, among others.

FSAE tries to stay in contact and maintain dialogue with different officals and institutions who are responsible for, or whose work pertains to, the quality of our acoustic environments.

Contact: contact-fsae@wfae.net, http://www.100aanimaisemaa.fi

Forum Klanglandschaft

by Lorenz Schwarz

The Soundscape Forum (or Forum Klanglandschaft–FKL in German) acts as an information platform in central Europe. It supports activities in science, art and education. It initiates and promotes relations between these fields which aim at widening sensitivity for the sonic environment and improving its quality. The association generates and mediates knowledge and innovative methods, which support active and creative listening. FKL supports operations (such as those found in the contexts of urban development or landscape architecture), which serve a conscious and responsible interaction with acoustic spaces and times.

The main activity is a biennial meeting where FKL-members are invited to discuss and exchange their present soundscape research and soundscape art projects. In addition an email-newsletter is sent to the members every two month. The FKL-homepage (http://www.klanglandschaft.org) announces updates concerning soundscape projects in the members' countries of Austria, Germany, Italy and Switzerland. During the year FKL organizes a wide range of local soundscape events, including soundwalks, small conferences, concerts, radio broadcasts, and sound art competitions. We welcome your inquiries and participation.

Contact: contact-fkl@wfae.net, http://www.klanglandschaft.org

Hellenic Society for Acoustic Ecology

By Andreas Mniestris and John D. Pantis

A group of artists and scientists interested in environmental sound started working on a soundscape research project in Corfu, Greece a couple of years ago. One of the very important results of this collaboration is the formation of the Hellenic Society for Acoustic Ecology (HSAE). This initiative came about as an enthusiastic response of the members of this group to the perspective, on one hand, of maintaining and broadening the activities related to environmental sound issues in Greece and, on the other, of joining the vibrant international community of Acoustic Ecology.

Some of the most important aims of our society include the development of Acoustic Ecology in Greece, the protection of sound environments from degrading factors, the organization of activities to enhance environmental sound awareness and the interdisciplinary collaboration for the production and dissemination of scientific, artistic and educational work.

Our group has already completed a project of environmental sound study in Corfu (*more on this project is presented in the Perspectives section of this issue on p. 42*) and we are continuing our activities with the ongoing soundscape documentation from all over Greece, the development of educational applications for impaired people based on environmental sound, a study on the application today in Greek protected areas of the European Parliament's Directive relating to the Assessment and Management of Environmental Noise, the production of soundscape composition works etc.

At the end of November 2007 we are organizing in Corfu the first Greek symposium on Acoustic Ecology. There, in addition to presentation and discussion of the results of our work so far, we hope this will be an opportunity for the gathering of others who are active in the study of environmental sound in Greece, as well as people who would like to pursue such activities in the future. We plan also a publication of the most important papers presented during this symposium. This event will conclude with the founding meeting of the HSAE and the election of its first board of directors, marking its official foundation. We hope that the affiliation with the WFAE will be completed soon after.

Contact: andreas@ionio.gr

We are pleased to join the WFAE as its newest affiliate, and to introduce WFAE members to projects underway in Mexico.

Mexican Forum And The National Phonotec

by Lidia Camacho

Sound Stimulation Directed to Children and Young People

- Design and elaboration of the *Notebook for sound explorers*, didactic material designed for children, in order to foment a culture of listening and to attune children to the sound world. In addition, this publication is intended to be a useful support for teachers and parents interested in forming new listening generations.
- Design and production of didactic materials *The Culture of Noise* directed to young people with the objective to inform them and to sensitize them towards the impact and repercussions that noise has on their health.

Investigation

- The project *Soundscape of Mexico* has the objective to identify, record, document, preserve, and encourage the sound diversity of each one of the states of the country. So far, the Soundscapes of Chiapas, Mexico City, and Michoacán have been produced.
- The Soundscape of San Luis Potosí is in recording process, in collaboration with the Minister of Culture of the Government of San Luis Potosí and Radio Berlín Brandenburgo. At the same time, negotiations to produce the Soundscape of Veracruz are in process with the Minister of Public Education of Veracruz and the Institute of Culture of Veracruz.

Japanese Association for Sound Ecology (JASE)

Keiko Torigoe

The JASE is one of the operating divisions of the Soundscape Association of Japan (SAJ), which was established in 1993. The establishment of the JASE was approved in 2002 by the SAJ and started its activities in the following year. Right now there are about 280 members of SAJ, with less than 10% of SAJ members belonging to JASE as well. JASE internationally functions as the official organization in the field of acoustic ecology of Japan, but in terms of national activities, the JASE is a part of the SAJ. This is why the JASE reports the SAJ's activities as its regional report from Japan.

The main items of the SAJ's activities are 1) the Annual General Meeting held around the end of May; 2) the Annual Symposium, which is open to the general public, held on the same day as the general meeting; 3) the Annual Academic Meeting held in the autumn; 4) the Japanese-language journal of the SAJ, called Soundscape, one issue per year (since 1999) whose table of contents includes refereed papers, field notes, special topics, and so on; 5) other types of events, held about three times a year, such as lectures, concerts, workshops and tours, which are somehow related to the theme of "soundscape"; 6) the Japanese-language newsletter of the SAJ, several issues per year. Also, we run the SAJ listservs on the internet, enabling members to exchange information, as well as the SAJ Home Page, which is in the process of preparing the contents in English.

The SAJ as well as the JASE consists of various professionals and students in the fields of architecture, community design, environmental studies and education, sociology, regional studies, environmental conservation and literature, radio/broadcasting and more, as well as music and mixed media. The SAJ is characterized by this wide range of its members' interest and professions. This is reflected in the fact that the SAJ has received three successive prominent presidents; Muneshige Sawada, philosopher, Koh Tanimura, a scholar of musicology and aesthetics, and current Masayuki Nishie, a scholar of linguistics and anthropology.

The WFAE conference in Hirosaki 2006 encouraged the JASE to get more involved in the international scene of acoustic ecology.

Contact: contact-jase@wfae.net

United Kingdom, & Ireland Soundscape Community

John Levack Drever

As I write this report in London for UKISC, London's iconic soundmark of Big Ben is muted for the third time in its life as it undergoes maintenance in preparation for its 150th anniversary in 2009. Right now I am putting the final touches to the 5th issue of our journal Earshot. It has been long awaited, made up of 14 articles on the theme of Noise: Debates, Strategies and Methodologies, and includes a CD of sounds submitted in response to a call for 'disappearing soundmarks', I am sure the wait will have been worth it. We will shortly have our website online (http://www.ukisc.org), which will include back issues of Earshot. We envisage that the website will be a hub for discourse and activity for UKISC members. Following on from our participation in the Greater London Authority's symposium Sounder Space, hosted by London Zoo in March 2007, we are planning a day of field work in Spring 2008 revisiting the World Soundscape Project's London Soundwalk of 1975, as documented in European Sound Diary (1977), in collaboration with the EPSRC funded Noise Futures Network. This will be advertised closer to the time. We also have some ambitious projects in the pipeline which we will share once they come to fruition.

Contact: contact-ukisc@wfae.net

Mexican Forum continued from opposite page

Diffusion

- Production of the radio program *Sounds walking on silence: From noise culture to acoustic ecology*. In this first stage 20 short programs were broadcast on Radio Educación, with the objective to sensitize the population to the importance of preserving the social sound environment via the promotion of a culture of acoustic ecology.
- At the present time the work of investigation, design, and production of the second stage of this series are being carried out. In this stage, the intention is to present the main projects, investigations, and international proposals regarding the diffusion of acoustic ecology, as well as the activities of the World Forum of Acoustic Ecology.

Professional Training

In the Diploma *Design and digital production of educational radio programs* the subject of the acoustic ecology was incorporated in the first module named *Foundations for the creation of the radiophonic image*. This will introduce 34 radio producers from diverse countries of Latin America to sound ecology, and encourage further radio productions.

Contact: contact-mfae@wfae.net

Deaf for a Day

By Edwin Karlow

Students in my Musical Acoustics course typically have "normal" hearing; i.e., no significant hearing losses. Most are musicians or at least participate in music making and sound recording. But they are, generally speaking, lazy listeners, having never given much attention to the detailed ingredients of the sounds that contribute to their daily life.

To help them take a step toward critical listening I have them wear earplugs for a day (foam NRR-29) while they perform their normal round of activities, and then react to their observations in a short essay. They like the assignment, and write provocatively about their personal experiences and the importance of their sonic environment. Beyond hearing protection, the earplugs became the means for discovery.

Soundscape Awareness

"Wow! What an experience I had in the past couple of days. I noticed several different changes in the way that I perceive sound. I cannot hear myself typing this paper, students and professors have given me strange looks, and I hear a thumping sound with every step I take."

"Everything around me seemed to speed up. When I arrived near the sources of sounds, I felt as if they just suddenly appeared out of nowhere! When I took my earplugs out, I noticed that sounds around me sounded very 'three-dimensional.' With the earplugs on, I can't hear sounds bouncing off various objects."

Body Sounds

"The first thing that struck me was how pronounced my internal hearing was. My breathing sounded like something from a cheesy sci-fi movie, inside a space suit. When I exerted myself, I could hear my heart beat, and when I walked, I could semi-feel/hear my footsteps."

"What I did not expect was that I could hear my own chewing much more clearly—especially while eating French fries!" "…and the water traveling down my throat as I drank from the water fountain."

Heightened Visual Sense

"I noticed that my eyes paid more attention to the surrounding environment. I became more aware of the shadows of trees, little cracks on the walkway, and the details of the birds that flew in front of me."

"I had not realized how heavily I relied on my two main senses [sight and hearing] to perceive the world around me. When one of those two was taken away, I found myself looking about far more frequently to keep tabs on what was happening."

"I sat in my usual spot (the last row) where I really had to concentrate to hear what was being said. I found myself focusing on the teacher's mouth to be sure I knew what he was saying."

"I predicted that I would be less aware of my surroundings, but I was surprised to find that…in fact, I tended to pay more attention with sight."

Inner Peace

"I simply walked around campus. I was more at peace and actually noticed more of the surroundings of where I was walking."

"Interacting with other people was a chore, so I tried to avoid talking to people after a while. Despite this difficulty, the absence of other sounds was surprisingly peaceful. I felt even more introverted than I usually am and it was easy to concentrate on my work."

Interpersonal Communication

"Whenever I perform a pops concert, I religiously wear my earplugs for both rehearsals and performances. I still feel the low bass thuds in my body, but I lose some communication ability with my stand partner. It feels like I'm in my own little world."

"It's usually pretty loud at TGI Friday's, because there are so many people. But with the earplugs it actually felt more intimate. I basically could only hear the people at my table."

Safety While Driving

"Awareness of the speed of the vehicle was drastically reduced, even when looking out the window at things whizzing by. The ability to pick up direction and warning sounds was lost."

"I did not realize that you use your ears to drive! It scared me when cars would pass me and I hadn't heard them approaching. I drove for only 30 minutes, but it was the longest 30 minutes of my life!"

Loss/Recovery of Ambience

"Almost all of the background noise, which I had become so accustomed to, was gone. Cars on the street, birds in the air, the sound of sprinklers…all the little things that you never notice are there until they are gone, were gone."

"When I took out the ear plugs…a rush of sound overwhelmed me. All the ambient noise that I tolerate day to day was all of a sudden at the forefront of my hearing."

Feeling to Hear

"The earplugs added a whole new dimension to what I would call 'feeling' the water [while I showered]. I was aware of the water hitting me everywhere and it felt like I could 'hear' with my body, all the places that the water would fall on me!"

"I arrived at chorale a bit early just to sit and listen to the sounds of the room and to get a feel for what it would be like trying to sing [with earplugs]. 'Think the note and sing it; if it feels good, then it's probably right' [my vocal coach taught me]. I never quite understood what he meant by it until that night in chorale. Most singers determine pitch based on what they hear, not what they feel. I had to resort to feeling the vibrations of those singing around me."

I had not anticipated the safety risk students would encounter if they drove a car solo. In subsequent assignments I warn them to be sure to have another occupant with them if they try driving while wearing earplugs.

The musicians in the class, especially the brass players, were already accustomed to using earplugs during rehearsals and performances to protect themselves against the long duration of high intensity sound they encounter on stage. (And these are mostly *classical* musicians!) Even so, there were features of their everyday soundscape they had never noticed, until now. Such experiences have been repeated over and over. How can those who make their business working with sound, who can be attentive to within 0.1 Hertz when tuning a musical instrument, be so oblivious to the soundscape they inhabit?

Some of the students have continued using the earplugs to help them focus their attention. Others began using them as a means of acoustical ear cleaning—to help them establish a sonic baseline for doing their studio post-processing. When I subsequently meet them on campus they remark how those previously unnoticed sounds nuance their life. Silence is no longer an enemy; quiet is not emptiness. They all seem truly grateful for the gift of hearing, their cavalier "indestructible" attitudes mostly mitigated.

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Soundwalk+Sculpture

By Scott Sherk

I.

Sound and space are inextricably connected, interlocked in a dynamic through which each performs the other…

—Background Noise: Perspectives on Sound Art, Brandon LaBelle

A few years ago instead of buying an iPod, I bought a competing device because I read that it could also record. Making field recordings soon became an obsession. I discovered John Cage in a new way, R. Murray Schafer cleaned my ears, and my technical needs increased. After experiencing Mid/Side stereo recording while attending the Cornell Nature Recording Workshop, I began to see a way to record space and the sounds that generate our aural knowledge of space. (One can easily identify the size of a space in the dark or with ones eyes closed with a simple clap of the hands.)

Having *heard* space, I was no longer content with my usual tools and materials. Since making sculpture involves the sensitive control and manipulation of spaces, *sound* became a necessary new tool to be used towards this end—making and shaping space.

My first sound installation was in the old Bethlehem Steel office in Bethlehem, PA. Artists were invited to do whatever they wanted to rooms in the building. I found an old projection room, painted it black, covered the floor with mulch, and played recordings that I had made in the Sierras. As one stuck their head through a small window into the room—the walls of the small room dissolved into an expansive soundscape of Beartrap Meadows at 6900 feet. Now this was space!

2.

The rhythm of walking generates a kind of rhythm of thinking, and the passage through a landscape echoes or stimulates the passage through a series of thoughts.

—Wanderlust: A History of Walking, Rebecca Solnit

I began *walking* with the idea that I would find interesting places to record, and that I would find visual and aural ways to document these places. I took along a GPS so that I could mark these interesting places. What I found, however, was that I never got very far as everything became interesting. This led me to begin to pay particular attention to the *walk* as the process, rather than a means to a destination. Walking and recording with both my stereo rig and the GPS led me to the realization that the act of walking was, itself, a *drawing* in space. And this *drawing*—my *walking*—could be represented three-dimensionally in *sculpture*. I could describe the space displaced by my walk in sculptural form and describe the spaces through which I walked with sound. The spaces of my walk become the sculpture. The spaces through which I walk become the recordings.

With the tools of sculpture and field recording I make landscapes. I take a walk. As I walk I record my path and elevation on a GPS. I also carry a stereo recording rig, and I record my walk with an emphasis on capturing the ambience of place and particularly the sonic sense of the three-dimensional space.

Back in the studio, I transform the GPS information of map coordinates and elevations into welded forms that describe my walk as a three-dimensional drawing in clear, steel space. I mix and edit my field recordings to accompany the sculptures. Together they generate a synthesis with palpable and specific space. These works are both soundscape and landscape.

I walk in both town and country. I have favorite walks along the Appalachian Trail. I have many walks from home, and I have walked in Ireland and Italy. I walked all over the lower east side of Manhattan. I recently walked Museum Mile in Manhattan recording the interiors of each museum and the sounds of Fifth Avenue. Each walk has its own peculiar shape that reflects the landscape into which I traveled. And each recording has its own space and aura reflecting the space through which I traversed.

I will be exhibiting this work at the Kim Foster Gallery, 529 West 20th Street, NY, NY in January 2008.

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Impermanence

By Ian Tromp

Stop for a moment: what do you hear? And now? And now? Guglielmo Marconi, the inventor of radio, said sounds never die, just grow progressively fainter. In an ultimate, scientific sense, this may be true. But to each of us, sound is extraordinarily transient.

Some afternoons, I love to sit on the floor in front of the fireplace and listen; the chimney acts as a sound-telescope and draws in all the sounds of the neighbourhood. No other place sounds like this, and no other day exactly like today, no moment precisely the same as the one that's just passed.

Two years back, I arrived in Mumbai late on a November night. Though the slums on the journey from the airport still glowed with light and hummed with sound, the city was relatively quiet. In the morning, a wall of noise crashed down on me as I fought to snatch a last few minutes of sleep. Rickshaws and cars honked and revved their engines; a temple bell somewhere nearby rang every minute or so; at the train station across the road from the hotel, a loudspeaker announced the arrival and departure of each train that rattled through. I wondered if I would sleep again in the coming two months, without the blessing of jet-lag to lull me.

I remembered that morning recently, sitting in the early morning quiet back home in England. I decided on that first day in India that I would keep a sound diary of the two months I stayed there, carrying around a small digital recorder I anyway needed for my work. I wanted some record of sounds alongside my photographs, so that I could more easily and more completely recall the places I visited.

For some reason I didn't manage to hold onto any of those recordings, except for a few seconds of a tea-wallah calling "chai! chai!" on an overnight train. Every other sound of those two months is gone now, at least in any form that I will ever hear again. I can imagine it, I can call up some trace of it from my memory, but my encompassing, vivid, in-the-moment experience has passed. The soundtrack of my days in Maharashtra is forever lost.

Day by day, I am more aware that things I see will change. I place an apple on the kitchen windowsill, and each morning it looks slightly different, its skin wrinkling in the light, its colour slowly washing out. Or, through that kitchen window, I notice the early daffodils growing taller day by day, readying themselves for another spring display.

A friend introduced me to an exercise in valuing the moment. She suggested starting from the statistical truth that someone of my background, living where I do, has a life expectancy of about 78 years. Subtract from that my current age, and it's plain that I have likely already seen spring come about half the times I will in my life.

But I tend not to think of this truth's application in sound—just as I might see only 40 more rounds of daffodils opening, so I might have just as few opportunities to hear a lark's beautiful song over an open meadow, or the newborn lambs bleating in the fields. And of course my life might be much shorter than that average—Santideva writes: "In a moment, life breaks its word." I might already have heard my last lark.

Closer to home, how many more times will I hear the sounds I hear right now—the neighbours' two young boys playing next door, their grandfather's voice occasionally mingling with theirs, muffled by the bricks and mortar that separate our terraced houses; a dog barking somewhere; a car alarm; the hum of the central heating, its ticks and clicks and creaks.

Two of my favourite pieces of contemporary music seem at opposite poles of this awareness. Gavin Bryars's *The Sinking of the Titanic* plays with Marconi's idea, imagining that the music the band apparently continued to play as the great liner went down still reverberates in the chamber of its body. And William Basinski's desolate, beautiful *Disintegration Loops* record their own destruction, as longer and longer snatches of silence intrude into the music, the substance of the magnetic tape on which the simple piano loops were originally recorded slowly falling to dust.

Living with an awareness of impermanence means also knowing that each sound I hear—the morning rush hour traffic, this afternoon's quiet, the freight train just now passing on the lines nearby—may be for the last time. It interests me that doing this, holding this reflection in mind, is—for me at least—more effecting, more immediate, than is the truth that every scene I see also will never be repeated exactly as it is right now. Maybe that's because the sounds change more quickly—their suspension in time passes more rapidly than the shadow that creeps across the wall as the sun sinks.

But both these awarenesses, of what is heard and what is seen inevitably passing, bring to mind the Japanese idea of *mono no aware*, which translates roughly as 'the pathos of things'. It is a gentle sadness at impermanence, the passing of everything that we see and hear (or smell or touch or taste or think). There is a natural tendency either to fall into a depressive slump or to become overly dry and matter-of-fact in face of the truth that everything that now is, will pass away—and moment by moment by moment is already disappearing and never will return. But the tone of *mono no aware* is heartfelt and heartful.

Just as the disintegration of Basinski's loops every time I hear them brings me to tears, so perhaps could I always feel my heart opened further and further by the sadness of each passing moment, each sound that dies into silence. Now. And now. And now.

Ian Tromp has published poems, essays and reviews in journals internationally. He currently lives in Birmingham, England, with his wife, and is training as a psychotherapist. **ian.tromp@gmail.com**

My Favourite London Sound

Sunday, March 18, 2007

At the Sounder Spaces Conference (London, 14 March 2007), the British Phonographer Peter Cusack mentioned a Japanese girl whose favourite London sound was the sound of frying onions in her kitchen. The reason she so enjoyed this sound was that she had only recently moved from Japan to London, and when she was frying onions, the sound made her think of being home in Japan. By knowing her preference of London sound, we can sense that she was homesick and the sound was nostalgic to her.

As I have been living in London for quite a few years, I have gradually become insensitive to many sounds of London. Nevertheless, there is a sound that always touches my heart with the sense of nostalgia. That is the sound emitted from the P.A. system of the Piccadilly line of the London tube, a sound that says, "this train is for Heathrow Airport." When I hear it, I cannot stop wishing that I could take this train to the last stop and get off at the airport. Then simply by taking the plane, I could return to my family in Taiwan! Just take this train and get off at Heathrow Airport! Yes, I am almost there!

Every time when I physically complete this journey, it is always my happiest moment in London.

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Research Reports for the Ears: Soundscape Art in Scientific Presentations

By Jim Cummings

Note: *This article features accompanying sound files, available online. See the note on Page 2 for instructions about accessing this issue's audio supplement.*

The relationship or synergy between art and science has typically been viewed through one of three general frames. The first, and probably most interesting to scientists, is the idea that art has an interpretive function—building on the sense that artists are, at times, more capable of expressing the beauty or the complexity of science's findings, or that the artist can shape imagery or sound to express the essence of what science is discovering in ways people can better grasp (one example is sonification of scientific data). The second is found in artists who are simply inspired by science, using it as a jumping off point for artworks that are compelling on purely artistic merit, incorporating elements that involve nature or scientific imagery, while not centrally trying to share concrete scientific findings or data. And finally, quite often, exercises in "art and science" engage the relationship in less direct practical or philosophical ways, in which the art is presented via technology's tools, or science provides a jumping off place for the artist's vision.

At one of the leading edges of the interplay between art and science is yet another possibility, one that explores ways that listening, recording, and soundscape composition offer avenues through which artistic insights and methods can actively participate in scientific inquiry, by framing questions about what science might look at and listen for. This is sound art that both presents empirical scientific data in a way that can engage the public, and frames new questions or hypotheses that are worthy of further scientific investigation. When fully embraced, this approach produces soundscape compositions that are meant to be as richly informative as a scientific paper or in-depth essay for a general interest audience.

This particular angle of exploration has bubbled up in northern New Mexico, USA, where the little community of acoustic ecology folks includes two people who have centered their own artistic lives on this theme. David Dunn is an especially curious listener, recordist, and engineer. His most recent project delves deep into the bioacoustics of a species of bark beetle that is devouring the region's indigenous piñon pine forests; his recordings clearly suggest a previously unknown diversity of sounds that have caught the interest of entomologists. Steve Feld, by contrast, works in the social sciences. He's an award-winning anthropologist and musicologist who has spent a quarter century championing a consideration of an anthropology of sound (not just music), and creating soundscape compositions as a way of sharing his field research findings and inquiries. This paper will center on their work, though we are eager to engage with other scientist/artists exploring similar terrain.

Listening to Dying Trees

Dunn says, in the liner notes to his bark beetle CD, *The Sound of Light in Trees*, "My foremost interest these days concerns ways that formal concepts and techniques of music and sound art can contribute to scientific research. Not only can sound artists reveal new phenomena within the natural world; their creative strategies for creating a compelling sonic experience out of the sounds of the natural world can have a deeper application within science itself." Part of his inspiration derives from his long-held conviction that there is a deep and profound intelligence innate to all of life and that, as he says, "what science now reveals to us about the communicative intent of other living things will appear comically shallow to us in a hundred years." In this time of mounting ecological crisis, he is turning more and more, in his art and in his own personal inquiry, toward listening to what the life around us is saying, and especially to voices that are not within our normal auditory experience. He spends long hours listening to bats through his innovative low-cost/high-fidelity omnidirectional ultrasonic mic, and to beetles in trees using probe and contact mics. He notes the addictive quality of having his aural sense expanded through technology: "It is truly amazing to sit for hours in the natural world with your ears technologically sensitized to be more on a par with the other forms of life around you…This means of focusing technology towards a kind of expansion of consciousness gives us access to listening beyond the boundaries of our usual human perception. It applies current technological breakthroughs in music and sound art towards a non-human centered and environmentally relevant art practice."

Steve Feld tunes into ocean waves

David believes that the art world desperately needs to ground its imagination in a deeper understanding of the natural world, and that science is likewise yearning to reach beyond the limits imposed by its inherent need to be deeply rigorous, a rigor which by its very nature necessitates a kind of narrowness that can stifle or distrust

our imaginative natures. As Gregory Bateson said: "Rigor alone is paralytic death, but imagination alone is insanity."

So, what has David been discovering? And how is he presenting this work, to the public and to the scientific community?

This would be a good time to pause from reading, and go online to listen to the first few tracks that accompany this article: a few short segments of David's source recordings, highlighting particular tree and beetle sounds.

Online track: **Bark beetle source recordings**

There are some pretty interesting acoustic behaviors in these tracks, some of which have never been studied by scientists (virtually all bioacoustics studies on bark beetles have occurred in laboratory settings; and, most beetle communication research centers on chemical signals). In the extensive liner notes to the resulting CD, he puts forth several informed speculations about the ways that the beetles seem to be using sound, and he's found some things that an entomologist at Columbia and researchers at Northern Arizona University have found very exciting. But we have to admit, these sounds in isolation are likely more interesting to entomologists than to the rest of us.

Now listen to how David is presenting this work as a whole:

Online track: **Bark beetle source recordings**

Feld at the Kali Vrissi Festival, Greece, where dancers wear up to seventy pounds of animal bells.

His composition puts the individual sounds into a dynamic whole, and opens our ears to the acoustic world inside piñon pines. In the short segment included online, I trust you'll be able to imagine the altered state of "tree-sound" that would grow as you listened to this for the full hour of the composition, and also perhaps the excitement that this piece might trigger for any curious entomologist. Here we have a soundscape composition that truly does have its roots equally grounded in the worlds of profound listening and scientific inquiry. The path of discovery traveled by Dunn is familiar to many of us: a sound artist notices something interesting, perhaps rarely heard before. In taking the next series of steps, Dunn has blazed a new and potentially transformative trail: he read scientific papers, talked to researchers, and realized that the implications of what he was hearing in piñon trees would offer fruitful lines of inquiry for researchers across several disciplines (to begin with, entomology, forestry, and complexity). These latter steps are not easy ones for many artists, but the rewards of this effort can be very exciting, for the artist and for the scientist. Dunn remains clear on his role, to uncover new things, and the role of the researchers, to dig in and figure out what is really going on. And in addition to the collaborative potentials of such deeper work by artists, perhaps the best reason to explore this path is that in these days of ecological breakdown, the earth needs us to foster all the synergy and insight we can muster.

Echo-Muse-Ecology

Steve Feld is an anthropologist and musician who spent 25 years visiting the Kaluli people around Mount Bosavi in Papua New Guinea. He's written award-winning academic books, and his work on the relationship between sound, music, and the surrounding environment is highly regarded among his peers in anthropology. Throughout his publishing career, he's been working to create a place for soundscape compositions within the academic publishing universe.

Feld repeatedly returns to a trialectic that he presents as the relation between sound, environment, and social relations. He hears sound as a medium that can be approached as a palpable, sensate link between people and place. The sound of a place is a sort of creative engagement through which people both become aware of their surroundings, and in turn become a part of their place. He expresses this insight, and puts forward this anthropological argument, through the creation of soundscape compositions.

From the first track of his first academic LP, which was a 12-minute mix of rainforest sounds and human activity, Feld has employed soundscape composition to articulate his field work. That lead track to his otherwise rather typical academic ethnographic LP got some radio play, and led to the commissioning of a 25 minute production for National Public Radio, which in turn triggered an invitation from Mickey Hart to produce a full CD for his fledgling The World imprint on the Ryko label, using state of the art recording gear. Feld has continued to produce and release CDs of his field work, most recently on his own VoxLox label. Throughout, Feld has kept to a core theme:

"The idea was the same, to have the sound raise the question about the relation of voice and place, to provoke you to hear sound making as place making. And when you hear the way birds overlap in the forest and you hear the way voices overlap in the forest, all of a sudden you can grasp something at a sensuous level that is considerably more abstract and difficult to convey in a written ethnography."

The next online sound file gives a taste of this; listening to this track of Bosavi men cutting plants and singing, it's clear that no narrative description could provide the depth of understanding (of the culture, and of Feld's academic inquiry) provided by the audio experience.

Online track: **Bosavi Men Clearing**

Feld's editing approach is far more involved, and involving, than simply condensing time or featuring especially evocative or illustrative moments. He stresses that his pieces are structured so as to invite the listener into a kind of memory, a listening experience in which he draws on the "echo" that is inherent in acoustic ecology, the ways that listening—and especially recording—is always about being both in and out of time. He agrees completely with Murray Schafer that musical composition is the ideal way to present soundscape research.

"I'm working with a very simple idea, which is that what is important to Kaluli are things like texture, density...What I think is really compelling about trying to penetrate another world in any sensory mode, is to really imagine how they could possibly hear this. This is not a matter of trying to give you one way of hearing it, or enforcing the notion that there is any one best way to hear it, but putting it out there so that somehow you can move a little closer to imagining what kind of person a listening and sensing Kaluli person is. . . That's the best I can do, an anthropology of sound in and through sound, a representation of culture that is both a pleasure and an intellectual provocation, that gets your ears as close to the Bosavi world as I can get them. The idea is to turn my ear-witnessing into an invitation for your ear-witnessing."

Feld exploring the bellscapes of Europe

In addition to his ethnographic recordings, which nearly always include reference to the larger soundscape of the forest, Feld has produced one disc, *Rainforest Soundwalks*, that features just the rainforest sounds themselves, the acoustic field in which the Kaluli live and work. These soundwalks are not literal movement through the acoustic space of the forest, but, again, are composed recollections and invitations into a way of listening. They are mixed to accentuate a kind of heightened acoustic vigilance, a patience in listening and in being aurally present with the layers of forest sound.

"What you hear in these soundwalks are composites, not just of the layered height and depth, or space and time of the forest, but also of my history of listening and being taught to listen, over 25 years, in Bosavi. That's why I call this work an 'acoustemology', a sonic way of knowing place, a way of attending to hearing, a way of participating and absorbing."

An online excerpt from *Rainforest Soundwalks* illustrates this compositional approach.

Online track: **Rainforest Soundwalks (excerpt)**

"I think that soundscaping is first and foremost acoustic witnessing," says Feld. "The field part of the work is to "be there" in the fullest way. The studio part of the work is to make that original "being there" more repeatable, expandable, sharable, open to new kinds of participation...manipulating parameters and trying to feel which subtleties could be brought out a little more, which presences could be more present for uninitiated ears."

For the past eight years, Steve has been turning his ears to the place of bells in the acoustic ecology of village and urban life, in Europe, Africa, and Japan. He's creating a series of CDs, and eventually a DVD, that include the bells of flocks of sheep and goats, creating a sonic map as they move through the countryside, church bells chiming a kind of acoustic authority and daily time-keeping, and festival and costume bells that exemplify disruption and celebratory chaos. And especially, the relationships between these; once again, his exploration of place, sound, and society, and the sense of sonic memory held by these bells.

Online, you'll find a bit of the soundscape outside the village of Gragnana, Italy, centered on sheep and church bells.

Online track: **Time of Bells: Gragnana, Italy (excerpt)**

He's made some interesting discoveries, such as a church in Finland with a large bell that has the same resonant decay time as its ancient organ, and the centuries-old interactions between a flock of birds living in a town square in Norway, and the ringing of the church bells there. He also gives sonic illustration to the ethnographic research of others: on Crete, shepherds know every animal by the sound of its individual bell, and the bells of each flock are tuned by the bellmakers to provide a harmonious timbre.

He says: "real attention is being paid to these bells playing the roles of different voices for different animals. So all of these questions about how bells are tuned, how bells connect animals and shepherds, sounds and community space and time, all this stuff came over me. Like, what is this belling of the churches and town halls? Who owns time anyway? The church or the state? Even without knowing any of the details, it seemed like on the surface of it, there must be a big bell story about authority and power, the struggle of the church and state, the struggle between animals and people, the struggle between music and noise."

Most of the pieces on Steve's *Time of Bells* CDs are in the 8—12 minute range. He tends to engage in a form of hyperrealism in his editing aesthetics, overlaying a series of sonic vignettes or a long real-time movement through a church or festival bell-scape with echoes and interjections that open larger historical or ethnographic windows for us to ponder.

Resistance to Sonic Presentations of Research

Despite the obvious power of this approach to inform ethnographic inquiry, within the ivory tower of anthropology Feld struggles with a mindset that continues to see audio as a generally unimportant auxiliary to the written word. He says that it is almost impossible to present his audio work at conferences, due to incredibly poor sound systems, and points out how few books and journals include either CDs or links to web-based samples of the sounds that the written articles are interpreting. Part of this is because the quality of much field recording remains substandard, and part is an editorial attitude that downplays the value of recordings. He once did a pre-press editorial review of a book/CD combination, and in his comments wrote as much about the audio as the written elements; the editor later admitted he hadn't listened to the CD, didn't want to, and was including it only as a courtesy to the author.

Feld says, in a recent interview in *American Ethnologist*, "It seems to me that there is a serious issue of professionalism here. Publishing amateur or substandard sound, while perhaps grubby enough to strike the listener as really "authentic," only serves to undermine the seriousness of sound as an anthropological project…Until the sound recorder is presented and taught as a technology of creative and analytic mediation, which requires craft and editing and articulation just like writing, little will happen of an interesting sort in the anthropology of sound. We take writing so deeply seriously—the anthropologist as author. Yet, like film and video, which are still incredibly marginal, I think it is going to take considerable time before a more sophisticated use of these sound technologies takes hold in ethnographic practice. Until then, the anthropology of sound will continue to be mostly about words."

At the Acoustic Ecology Institute, we're doing what we can to increase appreciation for the role of sonic representations of research, in both the social and biological sciences. If you know people, artists or scientists, or artist/scientists like these two, who are doing work along these lines, we'd love to hear from them.

I encourage you to listen now to our final online track, recorded at a festival parade in Greece, highlighted by costumed animal dancers wearing 70 pounds of bells each—just try to make a case for how an academic paper could begin to give us this sort of sense of the place of these bells in the local experience. . . .

Online track: **Time of Bells, Kali Vrissi Festival, Greece (excerpt)**

For more on Steve Feld's work,
see http://www.VoxLox.net
http://www.AcousticEcology.org/feld

For more on David Dunn's work, see
http://www.AcousticEcology.org/dunn
http://www.davidddunn.com/~david

Jim Cummings is Executive Director of the Acoustic Ecology Institute, which brings together resources and information on sound-related environmental issues and the use of sound in art and science. **http://www.AcousticEcology.org.**

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Young Steve Feld in the Bosavi rainforest with his friend and mentor Seyaka Yubi.

Conversations: David Dunn, Nick Miller, Emily Thompson

By Steven M. Miller

Conducted in person, over the phone, and via email during fall & winter 2005–2006, these three conversations reflect a wide range of professional activities, each with a particular set of concerns and area of focus. My interest was in delving into the broad field of sound studies, and finding out what some of the leading practitioners in areas as diverse as academia, industry, arts, and sciences are doing, thinking, and talking about. What stands out to me as a link among the three is the passion, dedication, and deep concern for the acoustic environment in all its myriad forms. These are three individuals who truly turn their ideas into action. Brief excerpts from these conversations were first published online at http://www.arts-electric.org.

A Conversation with David Dunn, October 2005

Sound, Science, Music, Evolution, and Environment

David Dunn

David Dunn has a long history in the worlds of acoustic ecology, contemporary composition, and leading edge thinking. He is the author of *Music, Language, and Environment* (a CDROM of selected scores, writings, sounds, and images), *Skydrift* (a book documenting a large environmental sound project), and *Why Do Whales and Children Sing?:A Guide to Hearing in Nature*. He is the editor of *Harry Partch: An Anthology of Critical Perspectives* and *Eigenwelt der Apparate-welt: Pioneers of Electronic Art*.

Your work over the last couple of decades has involved sound making, listening, and the soundscape in a variety of public spaces, including urban, rural, and national park/wilderness settings. Increasingly, it seems, this work has shifted from primarily artistic to largely scientific in purpose. Can you briefly describe some of the recent projects on which you've been working?

I've been studying the role of sound communication in the ecology of piñon pine and its primary invertebrate pest, the piñon bark beetle (Ips confusus). My research indicates that a sonic attraction effect may be a significant factor in the dynamics of bark beetle infestation. Not only do the beetles emit sounds that may be a mode of communication, but the trees themselves, when under drought-induced stress, emit ultrasonic signals that the beetles may hear and may be attracted to. Unlike all of the prior bioacoustic research relative to bark beetles, I've been making extensive field recordings within the interior of the trees using my own custom designed transducers in order to study the relationships of the beetle sounds and tree sounds to the extent and geographic distribution of the beetle infestation in the piñon forests.

This work is, in a very real way, a synthesis, or perhaps a dialog between art and science. One of my interests has been in reframing a lot of the activity in which musicians have been engaged over the last half-century, particularly in the experimental American tradition but also some aspects of European music. I've always had the sense, for a very long time, that there's some deeper significance to this activity. We really don't know what it is we're engaged in.

In terms of sound making…?

In terms of sound making, music composition, and the whole activity—what we consider to be music in the experimental guise but also music in general. In some ways that's a silly statement, because we know perfectly well what it is—or at least most people think they do—and there's an overt aspect to that which is its entertainment purpose and its deeper cultural resonance in terms of ways in which music informs us collectively, and how we're engaged with that: the kinds of buttons it pushes in terms of emotional and physiological associations. But I've had this sense that there's another level, a kind of unconscious project that's at work. A lot of my work has been about reframing or re-examining—both historically and analytically; looking at what some of that activity might mean in the light of what I think may be its larger purpose.

So when I say that there's a scientific aspect to it, it isn't so much that I want to be a scientist. Although, it's funny, because in recent years I've come back full circle from my childhood and adolescence where I was very interested in science and natural history—an older notion of what science consists of, an older historical frame more like 19th century and early 20th century natural sciences and natural history—that whole Anglo-Saxon natural history tradition. It was always something I was really interested in and I've come back to appreciate that. I've come back to a sort of deeper appreciation of what science represents and the necessity to embrace it in the form of a kind of healing between the divergent cultures of art and science.

So there's an overt aspect to that. A lot of what I'm doing with the bark beetle work is, in many ways, scientific, and it's been funded as such: to go out and make these recordings and to formulate a hypothesis about what the nature of the bioacoustic activity of the beetles is. And that's been pretty interesting because it's meant that I've had to learn an awful lot very quickly. But there's a hidden agenda: I've been trying to make the case for what I think is an opportunity, and now a historical necessity, for artists to contribute towards scientific thinking. The entomologist and theorist of evolutionary biology E.O. Wilson talks about consilience and the role of art in relationship to science and the necessity for the two cultures to reconnect. Neither can be complete without the presence of the other. He talks about that through the notion of interpretation. Artists are the best at presenting the facts of nature as revealed by science, interpreting those and disseminating them to a broader public. It's an absolute dire necessity we now have to reach a larger audience in terms of what science is telling us. Artists are the visually and aurally literate of the culture. They are the trained filmmakers, photographers, sound artists, and interpreters at that level. That has also been the traditional relationship. Science does its thing and art enters as a kind of back-end function to interpret this and disseminate it to the world. I think that is only one important role.

However, there's another role that we're just beginning to be more aware of. It's a kind of front-end relationship between art and science that has the potential for artists to participate in hypothesis generation. What artists often do is to reframe how we experience the world and thereby ask questions that transcend the specialization and narrowness of current scientific training.

Your feeling, then, is that artists are not only good at interpreting answers but also at posing questions, and that those questions often are inherently cross disciplinary? The questions are not so narrowly focused as most advanced science is; they tend to be either themselves broader or have broader implications?

Yes, and the questions that artists ask are often synthetic in nature and as a result they're often the kinds of questions that are the most pithy, or relevant at this point historically—particularly in relation to ecological thinking which is by its nature a synthetic approach. So I think that there's a real potential there. But it's very difficult for scientists to be open to that notion, and with good reason. If you look around at a great deal of what constitutes the art world now—even as an artist I'm suspicious, if not appalled. So someone outside the discipline is going to think, "You've got to be kidding!"

"Why would I take this seriously?"

Yes, exactly. I think that's a really valid concern. But when the scientific world is open enough to allow that kind of relationship, interesting things can and do happen at the level of framing these synthetic questions and framing appropriate hypotheses. But, I do think there's a point at which one can be deluded into thinking one's really doing hard-core science. I think what I'm talking about requires a very different level of education for artists, which is to be much more grounded in terms of scientific theory and an understanding of what science is and does. You have to understand what the limits are of the questions you are asking. Then you can understand at what point it's appropriate to hand over your participation to really serious scientific research.

Do you think that, with the broad access to and adoption of technological tools, in terms of computing, etc., by artists, that essentially—whether consciously or not—we've been preparing ourselves for that role, or at least getting ourselves in a headspace where we don't see it as such an odd role to play?

I think that's actually the appropriate next question. That's the arena where this re-synthesis and new dialog between art and science has occurred just naturally. They've drifted together out of a commonality of tools. As a result, that's exactly the domain where artists are often really useful: the creative application of technology. It's a unique training by the nature of the kinds of things that artists concern themselves with, but now that's taken on a deeper resonance because of the way in which these technologies are used.

How has your work—particularly the work that you've done over the last 20–30 years dealing with sound making and the soundscape in public and natural spaces—how has that contributed to your understanding of humans' roles in the acoustic environment? What are our responsibilities there, whether as artists or just person-on-the-street walking through the acoustic environment? What's our role?

Well, I think the role should define the responsibility, but it hasn't. We really need to ask, "what is music about, what is this activity?" In terms of its evolutionary significance, Stephen Pinker, for instance, as a theorist of cognition, believes that music has no evolutionary meaning.

It's basically the appendix of the aural evolutionary body…?

He actually calls it auditory cheesecake. And yet, he thinks it's one of the great human mysteries because every culture we know or have known of had some form of music. There's obviously something significant about this, but on an evolutionary level he thinks there's no real imperative; it's just something that exists and is a rather extraordinary mystery because of that. I don't think that's true. I think that there really is a direct evolutionary imperative. Music is the vehicle through which we explore our auditory structural coupling to the external world.

In a sense it's a way of 'pinging' our environment; it's a way of understanding our relationship to what's making sounds around us.

Well, it's one way of understanding it, through sound. Music is one of the most profound means we have for growing the capacity to perceive the world through sound.

That's interesting, because one of the things that I've often told my music students is that musician/composers are the 'Research & Development' team for human consciousness. Artists of all kinds are, but specifically for musicians part of our job is not simply to make weird sounds but, as in true research and development, it's also about trying to come to an understanding that we can report back to everyone else.

Often the impetus to do that occurs in a very unconscious or subconscious manner. We think we're doing one thing when we're really doing another. It's what Buckminster Fuller called the principle of precession. We're motivated by, "Well, I want to learn to play electric guitar to attract girls"—and there's all these things that are driving us in some manner, and secondarily the more important things are sort of dragged along. We're evolving these capacities as we go.

In a sense it's parallel to the idea of play in childhood development. It's a fantastic way for them to explore their capabilities and relationship to their world, and to gain a better understanding of that relationship.

In that sense, the 'R&D' goes on in many ways. Possibly the most potent and important role for music is something we're evolving towards. Along the way we're trying to fit it to all these circumstances and it *fits* all of them—you know, selling laundry detergent, or as an alarm clock, or…

Or as sonic wallpaper in a supermarket…

…I mean, you name it—music is used for it. The superabundance of that is so large that it almost becomes absurd. It's so large that we really can't pin it down.

But, ironically, not only is it in superabundance, but it also exists in a superabundance of inattention, because mostly we don't notice it when it's fulfilling those roles. Not only don't we notice it's fulfilling those roles, we don't even notice it in those roles often—usually when it's most successfully done.

There are a lot of applications where the success of music is determined by how it resides at an unconscious level, or 'below the radar' on purpose…

To 'grease our skids' for various aims.

Film music is a good example of that. The less aware of it you are, the more successful it generally is.

In another interview with you that I read recently, you characterized your musical interests as "less in the expressive side of music behavior and more in the questions that are raised by the mere existence of musical phenomena". So my question in response to that statement is, what are some of these questions and what are some of the implications of them for musically active people (musicians, composers, etc.)?

Well, what I was referring to in that statement is something that a lot of musicians find threatening. "You mean, music is something other than what I've been dedicating my life to?" And that's not what I'm saying. In fact it's just the opposite. My argument is that all these things we hold precious as traditional musical values are a subset of something larger.

Placing them in a context.

Yes, placing them in a context, and I'm just saying that I happen to be more interested in the broader context, in the process of framing these things, than I am in participating in that traditional role.

Right. You're more interested in the context in which sound behavior happens than any particular emotional lever that sounds produce.

As a composer, I find it really boring to be engaged in that level. That's fine if other people are…if that excites them, then 'go for it'. Obviously there's a need for that and there's a lot of cultural reinforcement for that. That's what gets people careers and success and all the things we associate with musicians and all that stuff. It's just, personally, I have no particular interest in developing that. As a kid I spent hours and hours developing the neurological mapping necessary to play an acoustic instrument. That has a lot of value. And then when people want to turn that into something where they're being expressive about their life…again, I just don't think that it's necessarily what they think it is. They're engaged in an activity with a whole lot of assumptions, most of which are culturally reinforced, and much of which is not actually true.

Pine tree on the side of a cliff.

At least not beyond that surface level.

For instance, when one talks about music expressing emotion and ideas, I certainly accept that music can express emotion. But, if one examines that a little deeper, just what do we mean by 'emotion' and what are we referring to in terms of the traditional musical notions of that? There are now even psychological arguments that the deep physiological states that we experience as emotion are themselves cultural constructs. They are just so powerful that we assume they must have universal traits when they may actually be behaviors that we learn.

Larry Polansky's way of framing this question of what music communicates is to say, if all the claims people make for being able to express specific ideas through music, then music, in the absence of words, would be capable of telling someone what to go shopping for at the market. Music can't do that.

Yes, but that's different than emotional expression. That's specific semantic content, which operates on a certain level of consciousness that emotions don't.

Yes, but I'm not so sure, in terms of the claims that people make. Film music is a specific example of this. I think film music functions at the level of, "OK, here we've got the minor chords, and we're supposed to feel sad," and I don't think that the responses an audience has to it are innate to the musical expression. I think it's entire-

ly due to cultural reinforcement. In that sense, it's a set of semiotic codes. You know, we grow up with exposure to this and constant reinforcement. By the time we're a certain age we've got it pretty well down that the minor chords represent sad feelings. I don't think it really has much to do with authentic emotion. At that point, I don't even think we're necessarily experiencing emotion. I think we're experiencing a semiotic referred state, and like Pavlov's dog we're salivating in response to the stimulus we've been taught to respond to.

We're participating in the agreement that that's what it means…

And that's a cultural construct.

Right.

And in that sense it has semantic reference.

Or at least potentially does.

Functionally it ends up having it. If we're to talk about the authenticity of emotions—well yes, music expresses emotions as states of physiological response that are biologically hard-wired and that most of the time we don't have names for. A typical response to some of the most profound experimental music of the late 20th Century is a kind of 'fight or flight' response. It's triggered in the audience because of a sense of being overwhelmed. So much electronic music has this apocalyptic overwhelm and you get audiences sometimes freaking out and the composer wondering what happened.

Because that's how they're wired.

Yeah, it's biologically wired. Again, we think we're doing one thing when in fact we're doing another.

Or doing both, but not aware that we're doing the other.

Yeah, yeah.

In that same interview I referred to, you described music as, "a conservation strategy, a way of making sense of the world." How, if at all, does this articulate with the traditional roles—at least in the modern Western world—of composers, musicians, sound artists, etc.?

Um, I'll sort of slide into that, I guess. I think music is in many ways an atavism and a conserving strategy. It's a way of keeping alive a modality of communication that we share with other forms of life.

In that sense a non-linguistic form of communication?

Absolutely! I think [Noam] Chomsky is right when he says that human language is a species-specific adaptation. I accept that. But I don't think music is. I think we've evolved it in very ornate and uniquely human ways. The evolution of music is one of the ways in which we define what it means to be human. We keep redefining it as we keep redefining our humanity. What we have probably valued most, with this notion of an expressive modality of communication, is actually something that I think we share with other forms of life. One of my favorite thinkers, Gregory Bateson, took over John Lilly's dolphin communication lab in Hawaii for a couple of years. He came away from that experience with a fairly profound understanding of the differences between human and animal communication, what the distinct aspects were, and how they are similar. He came away with a conviction that dolphin communication, as an extraordinarily rich and complex form of communication, had very little in common with human language. The only thing he could relate it to, in terms of human experience, was music. Much more is being communicated by the complexity of this modality of communication than we have usually dared to imagine and that is something that musicians can relate to and talk about.

Or at least talk around…

Sure, sure! A great example of this is current research in the Canary Islands, where tour boats were jamming whale communications adjacent to the islands. The researcher who was looking into this was traveling in Western Africa and heard traditional West African drumming. He realized that there was something about this that was similar to the whale communication. He brought a master drummer to listen to the whales through hydrophones. What this master drummer heard, he understood to be a social hierarchy that was very similar to the way that a social hierarchy exists in West African drumming. That tradition is very well defined in terms of how you participate. This understanding allowed researchers to assign channels of relationship between passing boats such that aspects of the whale social hierarchy could be maintained.

At one and the same time, it's that basic *and* that profound… maybe because it's so basic it's so profound. So how does music, however we might define it then, fit into the overall world of the acoustic environment? And more importantly, what role do you think that composers, musicians, and sound artists have in helping us to better understand the acoustic environment? Part of the background to that question is that so many of the first generation of acoustic ecology researchers were composers. That doesn't seem to be coincidental to me.

Well, I think it was, and remains, a natural relationship, because that's what composers do. Composers are specialists in a manner of systemic thinking and residing at the edge of chaos. The really cool stuff exists at that edge between too much disorganization and too much order. I think we're not only trained to sense that edge but it's something that we are biologically wired to perceive.

Our senses are essentially 'difference detectors' so if there's undifferentiated 'constant difference', i.e. perceptual noise, it's perceptually the same as no difference at all.

If things are too ordered they're boring and if they're too chaotic they're boring. There's this happy medium that you can actually plot mathematically. It's this point where there's this interplay between redundancy of information and novelty. This is also what we mean by a musical structure. That's what composers do. Another way to frame that historically is that we evolved music out of a survival necessity: how do we listen to the soundscape we're embedded in and discern the details of it necessary for survival? For instance, the frequency range of hearing in most organisms—the frequencies that we can hear, coincide pretty well with the sounds of the things that we need to eat, and the things that eat us. That's pretty much where the bracket occurs.

So, if it's sonically outside our perception, that's ok because those typically tend to be the things we don't need to worry about anyway?

Yes. In terms of biological evolution, it doesn't make sense to invest much of our biological energetics towards things that we don't

need to perceive—things that are more or less outside the domain of relevance. The easy term I use for that is environmental hearing. The way in which we heard the soundscape was heavily invested with survival relevance. It's tied to hearing meaning in the world around us. We had to in order to survive. You can see the evolution of music move away from that as we become less concerned with the necessities of survival in the natural world and gain more control of the environment.

By the time of the ancient Greeks we move into this concern for music as pattern recognition and number theory as an underlying driving force of Greek culture. This concern with pattern recognition through number theory evolves and passes through a number of other stages into what I call spectral hearing. By the time of [Jean-Philippe] Rameau we have this obsession with hearing the vertical relationship of harmonic pattern and that becomes formalized in the physics of Fourier. In other words it's a refinement of what we perceive in the natural world, and a greater attention to human concerns rather than the natural world as external to us. It's less about the urgency of hearing the soundscape as meaningful as it is these other levels of cultural concern.

By the time we reach the 19th century, and [Hermann von] Helmholtz, we start to investigate the details of aural perception in a scientific way. We begin to dwell on our perception more, and use technical instrumentation to perceive the world. We now listen to the world through our instrumentation. It takes on another level of resonance by the time of John Cage. We redefine the nature of the environment, and how we hear it into a new kind of soundscape. We start to apply these aestheticized modalities of hearing that we've passed through to now listen to the natural world. We begin to hear the soundscape as a musical form. That's largely what Cage was all about. He kept saying that, "the music I love the most is just listening to the world around me." That's applying an aestheticized perception to the physical world. While composers were probably the first to do that, it's become a predominant way in which we listen to our environment. When you put that in conjunction with this technologically based way of perceiving the world, we come back full circle—or full spiral—back to a recapitulation of hearing the soundscape as meaningful; only now it's meaningful in a scientific sense. In the fields of bioacoustics, scientific sonification, acoustic ecology, bio-musicology—many of the most important participants in these fields are musicians. I think there's a historical necessity for it. We've come back to, in a very literal way, listening to the environment as meaningful and communicative. We now listen to the clues of the world around us, because it's in peril and we are therefore in peril. Unless we learn to focus our ears towards the sonic messages that the earth is telling us, we may not survive the next century or two. So when I talked earlier about my interest in framing the context in which this all has meaning—that's the context I was referring to.

But essentially what's going on behind the scenes is this dual role of development and training.

And sensitizing…

We're relearning to orient our ears to our acoustic surroundings again.

And with full necessity to do so! For me, all that other stuff about musical expressivity and its being a carrier of emotional expression, ceases to be as important as the focus upon that function, and in many ways constitutes a distraction from it.

In a sense, at best it is window dressing; at worst it's distracting our attention from this larger purpose?

I wouldn't maybe go that far. I think it's more than window dressing. I think it always has been more than window dressing and, in fact—in the attempt to express ourselves and create social bonds and cohesion in the way that music expresses and performs that function—we are evolving new ways of hearing. I would say that, in some sense, every musical composition, every musical expression, in some way participates in the expansion of the boundary of perception; how we hear the world, how we relate through sound to our world. Every piece of music does that even though that may not be what is driving the individual that made it. I personally want to listen to a musical composition for its content about how it changes the way I may listen to the world. The most important aspect is whether it informs me about new ways to perceive things.

I talk about how one of my central interests as a musician and composer is to pose the question, 'what does music contribute to the concept of mind?' And I choose the term 'mind' for very specific reasons. We use the word 'perception', or 'cognition', or 'consciousness', or others—there's this nimbus of these terms—and we're referring to something, but for the most part they're all so general that they're interchangeable. Different disciplines want to parse all of these terms in different ways.

Sure, and locate them in different places.

Yes, and locate them in different places. For the most part it's completely arbitrary. I prefer to use the term mind, which is in some sense the most fundamental definition for these things. Gregory Bateson poses a cybernetic concept of mind. Mind arises from as little as two components in a circuit and an exchange of information in the form of difference. These circuits of relationship are the most fundamental and simple level at which I understand these things. It's also a convenient point for understanding the concept of emergent properties—this idea that complexity arises from the interaction of very simple elements. How things come together gives rise to things that are greater than the sum of the parts.

Essentially, a difference in scale from the very simple to the most complex is a more of a quantitative difference than a qualitative difference, but at the higher end of the complexity scale there are more possibilities for emergent behavior because of the interactions of these simple units?

That's a pretty fair way of putting it. So, in that light the difference between cognition and perception that you're posing—cognition implies this kind of stable structure of mind at a certain level of complexity, and perception is the vehicle through which structural coupling takes place between mind and environment.

Which leads me to the obvious question, responding to that and your mention of emergent properties. Tell me about the current project you're working on in terms of the sonification of chaotic attractors and other types of dynamical functions. Where does that fit into, or articulate with, what we've just been talking about?

There are a couple of levels. First of all, in recent years—I've made an overt shift from framing my work within linguistic metaphors and concepts into framing what I do in terms of complexity science models. More specifically I've been collaborating with the physicist James P. Crutchfield on something called *The Theater of Pattern Formation*, visualizations and sonifications of non-linear dynamics. It's a particularly compelling project for me as a composer because the mathematics produces such rich sonic structures.

Doesn't that depend on the skill of the person doing the sonification? The chaotic functions themselves have no inherent sound but for someone like you who's interested in them, you have ways of turning them into particularly rich sounds. I just want to point out, to someone coming to this interview from a non-science background, that the richness is not inherent in the data.

It's a very good example of the interpretive function between art and science and the richness of potential collaboration. I'm interested in exploring these things not only because of the sounds that they make but also because it's a way of rationalizing some important historical activity. I think a great deal of the activity we were engaged in as composers and sound artists during the 60's and 70's—David Tudor, Sal Martirano, Richard Maxfield and many others who were doing experimental work—was based upon these dynamical principles but we had no idea that that was what we were working with.

The vocabulary either had not developed or hadn't penetrated the sound art world.

It was all intuitive, and interestingly enough, the analog synthesizers that we were playing around with at the time really are forms of analog computers. We were playing with those at the same time that the chaos guys were using analog computers from the aerospace industry. Digital computers weren't fast enough to do the visualizations they were playing with. We were all using the same kinds of tools, on one level mathematically rationalized and on another level entirely intuitive sonic play.

And, not insignificantly, on one level with industrially designed, very expensive tools, and on the other completely home-brew things soldered together by a bunch of composers in their garages.

Yes, but using very similar circuits. They were all forms of analog computers. So, part of my playing around with this stuff shines light upon a particular domain of musical research that's gone on and gives it a more rational perspective. This is very similar to the way in which these unconscious processes, that I referred to earlier, unfold. You can also see them in the history of science. When Poincaré and other mathematicians were doing what they did at the beginning of the 20th century, it was also largely an intuitive process. They really weren't particularly interested in practical applications. They were playing around in an imaginative and theoretical manner. But now their ideas have come to full fruition in current physics.

They've essentially become very potent metaphors for understanding all kinds of phenomena in the world—sonic, visual, evolutionary, geological, etc., etc.

And it's precisely that intuition which is behind my intellectual interest. A lot of the same dynamical properties of these ordinary differential equations that define these chaotic attractors, and produce beautiful geometric objects and sonifications, underlie a lot of the natural world in terms of pattern formation. Turbulence flow, cloud formation, the circadian rhythms of our bodies—more and more we're coming to realize that the underlying structures of all kinds of different natural phenomena can be described by the same mathematics. As someone interested in the sound communication of non-human living things, my interest in complexity theory and playing around with these equations and their sonification is a form of play that might shed light on the generative processes at work in complex natural soundscapes.

What you're working on is developing models that help to explain what's out there, which then will help us to better perceive what is going on in the world?

It is to expand our capacity to aurally structurally couple with the external world. The connections are quite overt and reinforced by experiences I've had doing soundscape recording. One of the best examples of that is the experience I had in the Atchafalaya Swamps of Louisiana. I heard extraordinary spatial phase transitions in the soundscape occurring over many hours. When you sit all night long in a place with such biodiversity, you get exposed to some extraordinary things that I think may only be explained by these kinds of non-linear dynamical processes.

Right, and would it be out of place to say that—tying in another part of our conversation—those are also emergent properties, in the sense of emergent properties of mind in the acoustic ecology of the place?

Well I think that's where it gets really intriguing. At what point are we willing to redefine our understanding of the intelligence of the non-human world? Ultimately, I think that's the most fundamental question. And in light of that, for all the scientific insight we have and for which I have respect, I think almost all of it is going to look foolish in another hundred years, specifically with regard to how we understand this property of mind and the richness of solutions for how the non-human world thinks.

In other words, what will likely end up looking foolish is artificial demarcations based on 'human vs. non-human'.

It defines everything about how we relate to the natural environment, and to other living things, and how we place ourselves in relationship to them.

And, therefore, our responsibilities to them.

Absolutely! There are all these very profound questions about human-animal relationships, about how we relate to the non-human world. Fundamentally what is at work is the potential for a revolution—a more pervasive and radical redefinition of what it means to be human, and the nature of how we organize the societies we live in. The more we come to erase that boundary—this arbitrary definition of human mind over non-human mind—there is the potential to change everything. In many ways it's one of those issues where it isn't so much about our willingness to embrace the philosophical truth. It has less to do with the truth that's revealed to us than with the discomfort engendered by the reorganization required from that truth. We may never get to the point where we create a human society that is in tune with what we actually understand the nature of non-human mind to be, because it's too big a leap—it's too big a demand: the redefinition of everything that's human.

I'm not sure which spiritual tradition this comes from, but the phrase "looking into the face of god" comes to mind. I mean, that's essentially how big that realization is. It's that awesome a proposition.

And if we really do come to that point where we can no longer arbitrarily separate ourselves, meaning that we don't have dominion, all bets are off. It means we have to restructure and redefine almost every aspect of the societies we have created. At what point can we or will we be willing to do that?

A Conversation with Nicholas Miller, November 2005

Nicholas (Nick) Miller is an acoustician and noise control consultant. He co-founded the consulting firm Harris Miller Miller & Hanson, Inc. in 1981. http://hmmh.com

Your work over the last couple of decades has engaged with noise issues in primarily public spaces, encompassing urban, rural, and national park/wilderness spaces. What are some of the most important impacts and effects of noise on people in these settings? What are the primary sources of noise problems? What are some of the historical approaches to dealing with them?

In terms of effects, interference can lead to an emotional negative reaction, termed annoyance, though experiencing interference does not always result in annoyance. Interference can be with speech/conversation, listening/contemplation, or relaxation. It varies widely by individual, though one can always derive average responses which we have done in national parks.

Sources vary widely. In major urban areas they can be honking horns, car alarms, car stereos, highway or street traffic either in general or specific vehicles such as loud trucks or motorcycles or buses, parties/rowdy people, sirens, trash pick-up trucks, back-up alarms, barking dogs, etc. In suburban areas it's more likely to be lawn mowers, dogs, go-carts, motorbikes, student parties. Highway traffic noise affects mainly those living within several hundred to about 1000 to 1500 feet of the roadway. Aircraft operations often affect people living within 3 miles or more of the airport, depending on number of operations per day and night. In national parks, remote areas with little local sources of noise, small aircraft, tour aircraft, and even high altitude jets can cause interference and annoyance. ATV's are likely a problem in some areas, though we have not been involved with these sources; I know, however that some states are concerned about the noise and other effects of Off Highway Vehicles. Jet skis and high-powered watercraft can cause adverse reactions along and around waterways. Snowmobiles have been problematic in rural areas and some parks (Yellowstone). Generally speaking, it's hard to find any place where some sort of human-produced sounds are not heard regularly – within minutes, not within hours of listening.

Nicholas Miller

The well-developed approaches are really for sources that are the subject of government oversight—aircraft, highway traffic and rail/rapid transit systems. Each of these sources is regularly affected by government actions that require documentation of environmental effects. New or expanded runways, widened highways, expanded or improved track beds and rail alignments are all actions that can require noise and environmental analyses. For general design of public spaces and management of national parks, the jury is still out (or hasn't even been selected). That is to say, the major transportation modes all have documented methods for determining "impact" based on quantitative values (decibels of one form or another). This goes for the military services as well—Army, Navy/Marines and Air Force. But public spaces and parks are more likely to be designed or managed to provide specific opportunities to the public/visitors and these opportunities, such as rest, contemplation, conversation or even performances, have not been much studied in terms of what soundscapes are appropriate, and certainly not quantified; hence no approach, historical or recent has yet emerged.

How aware is the general public of noise issues? How is this level of awareness (or lack thereof) manifest in public debate on noise issues?

Those living near airports and along major transportation routes are well aware of noise issues. However, whether or not they know whom to complain to may have a major effect on actions they do or don't take. Also, people's reaction to noise varies widely—some may be little bothered by sounds and levels that seriously annoy others. I think the Internet has made it possible for widely distributed interest groups to link up and find common ground. Google searches can turn up all sorts of activities and information. In the US, "Airport Noise Report" is the newsletter that everyone in aviation reads to find out what's happening. The site http://www.nonoise.org is sort of a clearinghouse for all sorts of information about noise issues. Interest groups range from those focused on specific sources of noise (airports, highways, parks) to the aesthetics of the sound environment.

Part of the mission of the National Park Service (NPS), in managing public lands, is to preserve, restore, and/or protect natural resources for future generations. Included among these resources, both implicitly and explicitly, is the natural soundscape. In terms of national parks/wilderness spaces, what are the main obstacles, in your opinion, to effectively managing these soundscapes? What strategies are likely to be most effective in overcoming these obstacles?

I would say that for NPS the main difficulties are in formulating a consistent, well-developed process across so many different park units. They are, however, making progress in staff awareness and I have a sense that the NPS Natural Sounds Office in Ft. Collins, CO is making progress in spreading the word among park managers. The unanswered critical question is, however, how much human produced sound is acceptable in park settings.

The issue is really not to get too involved in the metrics at first, because in the park system there are not only the visitor reactions, but the other side of it is opportunities for visitors because visitor reactions may not correlate with the opportunities that the parks are trying to provide. Parks have their own management perspectives, and part of it is mandated by Congress—when it sets up a park—as to what its purpose is. The park management then tries to fulfill that purpose, and do so while managing the park for certain experiences and for preservation as well. So, as I've understood it, and I think I'm quite correct because I've talked to them a lot about this, in managing a park it really is a synthesis of a whole bunch of objectives that they're trying to meet. Not solely the visitor's experience, but the visitor's experience plus a lot of other things. For example, what soundscape is appropriate for a Civil War battlefield? Or visually, a visitor might enjoy the rolling hills but not realize that, back then, they really didn't have those types of fences, or something like that. And so the park management is aware of that and is always trying, to the extent they can, to adjust the park to fulfill its purpose and what they think is appropriate.

In terms of acoustics, or the soundscape, the point is that the park management really needs to 'get out there' and decide, through a synthesis, what parts of their parks sound the way they should. If there's quantitative data available that certainly helps, but they also have to make some judgments based on their experiences as to what's appropriate. And that, I think, should happen before anything else,

Continued on page 20

Sound Garden: New York City, July 2007

Installations by members of the New York Society for Acoustic Ecology (NYSAE) brought acoustic awareness to CitySol, an arts festival held July 12–15, 2007 along the Hudson River in New York City, in which all works were solar, wind, water, or people powered.

SlapHappy, by Andrea Callard and David Watson

N., by Andrea Polli

Conversation, continued from p. 19

before thinking about metrics. Park management personnel do get rotated somewhat, but once they've been in a park for a while, they know what they're trying to achieve in different areas of the park. You know there's front country, there's back country, etc. There are parts of the backcountry where it's acceptable to have moderately frequent interaction with other hikers, and other parts where you're supposed to rarely see anyone, and they should have a sense of what soundscape goes along with that purpose. And so once they've decided that, for example, a given site's soundscape is what it should be, they can then bring in the acousticians and technical folks who will give you all the metrics they can think of that apply to that park and you can begin to narrow it down as to what some of the values of those metrics should be. One of the interesting things about it is that, in many ways, it's not the numbers that matter; it's what it sounds like. But the only way you can, over a long period of time and objectively, determine whether you are meeting your objectives is by some kind of metric because the staff personnel will change, or it may be hard—you know a manager can't sit out there for three days and decide if it has gotten worse.

As with any of these things, if you've got an issue, or even if a park is the way it should be, to keep it that way will mean you're probably going to have to constrain somebody. And those constraints, as we've found in the problems that we've worked on, those constraints are what cause the big problems. You know, you're telling snowmobilers "you can't use your snowmobiles there", or you're telling air tours they can't fly there, and it immediately raises conflicts. So how does one approach those issues in a way—if they're a federal agency they have to go through a public process, and if they're making changes they have to go through an environmental study process—they have to justify these changes in an orderly way.

In many cases, it seems that the various interests in the parks are at cross-purposes.

Yes, that's true. It's ironically true even within the park service mission. As you can easily imagine, to provide access and yet conduct preservation at the same time is difficult. And they get quite experienced at this, they're used to living with this kind of double mission, but the acoustic side was, as of ten or fifteen years ago, kind of a totally new thing as to how to grapple with that. And they're getting there, but the whole issue of choosing indicators, that's what they call them, I might call it a metric but they're really indicators—in terms of decibels or in terms of percent of time audible, for example—they're really indicators as to whether things are getting better or worse. They need those as part of their management approach over time.

In particular, you have been working to develop metrics for quantifying noise levels as well as methods for correlating these with park visitors' qualitative responses to their experiences of noise. How successful has this work been in terms of being able to use objective/quantitative data to understand and/or predict visitors' subjective/qualitative experiences? What are the current limitations of this work, and what is its long-term promise for developing into a set of fundamental tools for parks managers?

The dose-response work we did for the NPS, correlating the visitor's responses with the quantitative data, has not found application within the park system. It is regarded as too limited in number of samples, too much dependent on one short time period in too few locations and for only one type of noise (tour aircraft) to be broadly applicable. I see that work as only providing a sense for how visitors react to tour aircraft—not as applicable to developing guidelines for limitations. I should note again that visitor enjoyment is only part of the NPS mission—as you state above, their mission is to preserve resources, so NPS management must judge what it means to preserve or restore park soundscapes.

What techniques do you foresee gaining wider application within the park system in the future?

Well, I think that they'll end up with the things we've just been talking about, that include management judgment, and then public interaction, and politics. If you look for example at the history of snowmobiles in Yellowstone over the last five or eight years, you can see in microcosm there all of the conflicts that can come about—the

Oceanic, by Andrea Williams

Gnomon, by Brett Ian Balogh

suits and counter-suits as management goes in one direction. We were involved in helping quantify the audibility of snowmobiles under different circumstances, and different types of snow machines, for instance those carrying multiple people, how audible they would be over what areas of the park. So park management made some decisions and then they were changed by the politics and the administration had them go back and try again. As I read it, it's starting to work itself out in that they limited the total number of snowmobiles, and it was quite a high number relative to history, but they also required that that anybody going on a snowmobile in Yellowstone had to be part of a guided group. They also required 'latest technology' which is the [somewhat quieter] four-stroke engines. And for whatever reason, I haven't seen any research but the parks people might have an opinion, but for whatever reason the total number of snowmobiles dropped quite a bit. It just sort of happened. I just read about it in a couple of news reports, and haven't talked to any of the parks people about it, but that was kind of an interesting outcome.

So in this case if you go back in the history of it you'll see the efforts to make some quantitative judgments based on a rational approach, then politics get involved, and people are fearful that their business is going to be destroyed by limiting snowmobiles, and snowmobile users get upset, and lawsuits happen, and counter-suits…not to be facetious but I have heard the park service people say, "Well, we gotten sued by both sides so we must be almost there."

How would you describe the relationship of your work to the growing field of Acoustic Ecology?

My limited experience has been that those who are interested in "Acoustic Ecology" have differing opinions of what those words mean. However, no matter the definitions, I sense that what our work has to contribute is an understanding of how to collect and interpret quantitative data that could be used to further the pursuit or understanding of Acoustic Ecology. I think our/my background comes from the technical, engineering side of acoustics, while Acoustic Ecology attracts biologists, general environmentalists and those interested in the aesthetics and values of natural areas—but this depends again upon the definition of Acoustic Ecology.

In what ways do you see this quantitative understanding translating into the active work of soundscape design? Is there much work being done within the park system in terms of proactive design, as opposed to remediation of problem areas? Have you been involved in this end of the soundscape design process yourself?

As far as the national parks are concerned, I would say that the real design of the areas, well it has not really gotten to that stage while we've been working for them. It may yet, but it hasn't really. We were looking at individual problems as they came up, the air tours, the snowmobiles, the watercraft, etc. The rest of the question I don't think I can really answer in terms of the parks because I don't know where they are going with that. I believe they are trying to do that, they are trying to understand what the sources are and, again, the real tough question is, "How much is too much?" This is one that they're just going to have to work through by trial and error. So, as far as parks and soundscape design, I think that that's the desired end, the desired direction, in the sense of balancing the desire to preserve the natural sound environment with the need to permit access and different types of activity. That's what it's all about. I'm not sure, they may get there, but I think the encouraging part is that they do have an office [the Natural Sounds Office in Colorado] now that's working to that end.

There's a lot of attention given to soundscapes in Europe, especially in relation to impacts on places where people live—trying to understand the good things and the bad things about the soundscapes and how can they be modified to be more good than bad.

My understanding is that the European Commission has put in place some very strict noise control measures in a number of the urban areas and doing actually quite a bit of research and proactive work in that regard.

That's true. The European Commission has set up what is called the European Noise Directive. That is a process they've set up whereby the more heavily populated urban areas are supposed to go about mapping the sounds in their areas and looking for ways, eventually, to mitigate it or to alter the land use to be more compatible in terms

of noise. And they are doing a lot of research on it, too, and I think it kind of speaks to a couple of things about Europe; one is that they are, I believe, in much closer proximity to each other than in this country, the density is much greater and people are primarily city dwellers, and that's where you get the greatest amount of noise. If you've been to a European city, the sound of small motorbikes is a pretty common sound. But it also speaks to the European tendency to have a heavier focus at the government level on quality of life than we do in this country. We're very localized here.

So yeah, they're doing a lot. And actually we [HMMH, Inc.] are trying to help build awareness in the design and planning process in this country of the value of including soundscape design as part of the whole design package when they work on urban or suburban spaces, or even parks. But the soundscape and acoustics, for basically the past thirty years of my career, has been an 'after the fact' feature in the sense of 'OK, we have this noise problem, what do we do now that we've built this road?' It tends to be more band-aid sort of fixes, going back and putting up sound barriers and that sort of thing. Whereas what we're trying to encourage is thinking about the soundscape design right at the design stage. We see it in the cities in this kind of 'New Urbanism' and the focus on re-use of urban areas rather than continuing to sprawl, in thinking about what sort of uses you want, and where you want the roads laid out. A lot of people in other areas of design are starting to talk about 'smart growth'; you know, you don't just let things happen, there's a whole bunch of things you want to pay attention to when planning re-use of areas or even new subdivisions.

What you just said reminds me of an interview with Murray Schafer in a recent (July–August 2005) issue of Utne magazine. The issue has a focus, several articles, on Acoustic Ecology and 'quiet.' In the interview Schafer makes that same point, that part of his whole message and that of organizations like the World Forum for Acoustic Ecology, is to get beyond noise control and get the concept of soundscape design as a proactive discipline more firmly embedded, if you will, in the consciousness of developers, city planners, etc.

Yeah, and what we're trying to bring to that is what I alluded to with the quantitative aspect. If we can sit down with the planners, and architects, and engineers who are planning a new re-use of a city space and they can tell us things like traffic patterns, where they want the roads, what kind of traffic it will be – even if it's transit or rail – we can use our models and our database to construct basically a virtual soundscape. We can take recordings and put them together, mix them, in accordance with a lot of quantitative analysis so that they will sound the way this future space could sound. We're working on developing a process for soundscape design that lets people listen through headphones to a virtual soundscape so that they can make judgments. Because, as Murray Schafer was alluding to and what I was talking about, decibels alone don't really tell you what it's going to sound like, but those are the tools that can let you predict what will happen, and then using our expertise and recordings, and mixing techniques, we can put them together in the proper relationship so that you can actually listen.

Essentially a simulation system, or a mock-up system, to get an idea of what you'll be hearing once your plan comes to fruition?

Right! It's the analog of all these visual renderings and even 3-D graphic representations people use to get an idea of what it will look like. Well, we say, "Why don't we put in what it will sound like, too?" And so then people can really decide if that's what they want.

How widely disseminated within the field of noise control are the ideas, concepts, and writings on acoustic ecology by such people as Murray Schafer, Hildegard Westerkamp, Barry Truax, etc.? Is there much awareness of the body of literature out there?

I would say 'No'. I think I can say without too much immodesty, I think we're the first acoustician professionals that are trying to put this forward as a useful cross-fertilization to understand the way these folks have been thinking about sound and acoustics and bring it together with our knowledge of how you predict it, how you mitigate it, and all those technical things, to come up with good acoustic design for spaces. So, no, I would say there really isn't much awareness and we're trying to build that.

The World Forum for Acoustic Ecology along with its affiliated organizations is, along those same lines, working to develop that understanding a bit more within the professional and industrial fields.

Well that's good! You know I've been aware of Murray's book [*The Tuning of the World*, 1977 Knopf] for not that long now, all things considered, about seven or eight years and I was really amazed to find out that people had been thinking about these things in sort of semi-qualitative ways…because we started in the '70s, too, but we were on a different track. There's a third group out there, too, which is the universities that have their own take on acoustic ecology, so there's different people in quite different fields thinking about acoustics in very different ways. I think there's some overlap. I think there's some interest in universities about being able to judge the health of an ecosystem by its acoustics. Perhaps you've run across that?

In fact a friend and former colleague of mine, David Dunn, has done quite extensive work in bioacoustic research here in Northern New Mexico, and is currently working on a project related to the bark beetle infestation problem we're having in the pine forests, and how they're decimating the drought-weakened forests. He's been doing a lot of research, some of it funded by various agencies and organizations, essentially focused on acoustic monitoring of bark beetle movement and trying to get a handle on this. He's really done some amazing work. There are all kinds of takes on this idea of using acoustics to understand the environment and what's happening out there.

From our perspective, in the acoustics and noise and vibration control consulting business, our expertise developed from an engineering background. The first people who worked with federal agencies, once the environmental and noise control laws were passed in the early 1970's, we're basically scientists and engineers. Development of the land use and noise compatibility guidelines and recommendations came from quantitative analysis of people's annoyance reactions to noise – the well-known "Schultz Curve" that related percent of people "highly annoyed" to sound exposure level, and from quantitative data on what sound levels interfered with speech communication. I guess the agencies faced essentially the same problem currently faced by the national parks – reactions to sound / noise are so variable and subjective, that it's hard to develop defensible regulations without resort to numbers.

In any case, that's what was done and I think it has significantly limited the exposure of the public to the really egregious sound levels. But in the process I think we've forgotten that we have an alternate way to judge the suitability of a soundscape for a given location or activity – our ears. In situations where there are choices, where the whole process is not driven by regulations, we need to devise ways to let the decision-makers and the affected public hear what a space will sound like as part of the design process, just as they judge the appearance of a space with models, graphics or renderings before it is finally built. It's fascinating, and perhaps symptomatic of our need to quantify, that we forget that what really matters is what a place sounds like, what we hear or will hear when we listen, when we use our ears.

A Conversation with Emily Thompson, January 2006

Emily Thompson is an aural historian based at Princeton University. Her book *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America*, 1900–1933, published by MIT Press in 2002, details significant and profound changes in the sonic environment and the listening habits of Americans over the period 1900–1933.

Your work is primarily as a sound historian. What drew you into this work and what's your own background?

I would say that first and foremost, I am a student of American history. I study the early twentieth century, and I focus on the role of technology in American culture, with an emphasis on technologies that relate to sound and listening. I came to these subjects by a rather circuitous route. As a young person I had always been interested in music, but I grew up in a family of engineers, not artists, so when the time came to go to college, it seemed more prudent to study engineering than music. I thought that, after graduation, I might be able to get a job designing stereos or concert halls or something like that. While in school, I worked in the recording studios at the Eastman School of Music in Rochester NY, and I also did some radio production one summer at WQED-FM, in Pittsburgh. When I finished college, I wasn't able to find the kind of job I had hoped for. I looked into graduate studies in acoustics, but at the time—the mid-1980s—funding for graduate study was seemingly all related to military applications, which I was not interested in pursuing. Ultimately, I did get a very good engineering job, at Bell Labs in New Jersey, where I designed some integrated circuitry for a video teleconferencing system. After about a year at Bell Labs, however, I realized that this was not the kind of work I wanted to be doing five or ten years down the road. At the same time, I discovered that the field of History of Science and Technology existed. I had never encountered it in college. My undergraduate curriculum had been very narrowly technical, and I was increasingly feeling that my education was incomplete. I wanted to expose myself more liberally to the humanities, and so History of Science and Technology seemed like the perfect bridge to take me from where I was to where I wanted to go. I applied to graduate schools, and in my application essay, I described how I was interested in studying the history of acoustics to explore how concert hall design had changed over time. I knew absolutely nothing about the subject at that point, except that I wanted to learn about it. I was fortunate enough to be accepted into Princeton's graduate program, and while the transition from engineer to historian was difficult, it always felt right. The very first research paper that I wrote as a graduate student was about Wallace Sabine and the design of Symphony Hall in Boston in 1900. That paper ultimately grew into my doctoral dissertation, which subsequently became my book, *The Soundscape of Modernity*.

Your book, The *Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900–1933* (The MIT Press, 2002), details significant and profound changes in both the sonic environment and the listening habits of Americans, predominantly New Yorkers, over the period 1900–1933. Could you briefly summarize some of the inter-relationships that you explore among the changes in architectural acoustics, electronic media, listening habits, noise abatement, public policy, and the sonic environment during this period?

Well, the hardest part of that question is your call to be brief, but let me try: Simply put, America circa 1930 sounded very different from the way it had sounded just thirty years before. Additionally, people listened to those new sounds in distinctly new ways. The sounds themselves were increasingly the result of technological mediations. Scientists first discovered new ways to manipulate traditional building materials to control the behavior of sound in rooms. Later, new materials were developed to achieve even greater degrees of control. Finally, new electroacoustic technologies effected even greater results by transforming sound energy into easily manipulable electrical signals.

Accompanying these changes in the nature of sound were new trends in the culture of listening. The fundamental compulsion to control sound stimulated auditors to listen more critically, to determine whether this control had been achieved. The need for control stemmed in part from new worries about noise, as traditionally bothersome noises like animals and peddlers were drowned out by the technological crescendo of the modern city. The desire for control was also driven by a preoccupation with efficiency, which demanded the elimination of all things unnecessary, including unnecessary sounds. Finally, control was a means to exercise choice in a market filled with aural commodities. It allowed consumers to identify what constituted "good sound," and to evaluate whether or not particular products achieved it.

Perhaps the most significant result of these physical and cultural changes was a reformulation of the relationship between sound and space. Indeed, as the new soundscape took shape, sound was gradually dissociated from space until the traditional relationship virtually ceased to exist. By 1930, "good sound" was defined as sound that was clear and direct, signal-like in clarity and free of any spatial characteristics, particularly, free of reverberation—the lingering over time of residual sound that had always been a direct result of the architecture surrounding that sound. Previously, reverberation had constituted the acoustic signature of a place. It indicated the unique architectural character of the specific site in which a particular sound was heard. Now, such residual sound was redefined as noise—unnecessary and unwanted—and it was eliminated through technological interventions.

Reverberation can also be characterized as aurally defining space through time, so I argue that the modern, non-reverberant sound can also be seen as transforming the traditional relationship between space and time. In this way, the story of the rise of the modern soundscape parallels stories of other transformations of traditional space-time relationships, transformations long considered to be constitutive of "Modernity-with-a-capital-M": the Cubist art of Pablo Picasso; the relativistic physics of Albert Einstein; the stream-of-consciousness prose of James Joyce. Modern artists, physicists and writers were fully conscious of the revolutionary character of their work. Modern acousticians were just as aware, but until now few historians have thought to place sound meters and acoustical tile ceilings alongside E = mc2 and *Ulysses* in the pantheon of quintessentially modern artifacts. In my book, I attempt to do exactly that.

What can an understanding of this pivotal era contribute to our understanding of our contemporary soundscape?

Well, I should confess up front that, as a historian, my primary motivation is to understand the past on its own terms, to recover its internal meanings in a way that ideally takes us out of our own era and back to an earlier way of life. Nonetheless, any successful history—like any good book—should speak to the lives of its readers as well as its subjects, and I do hope that my book accomplishes this.

For readers who haven't previously thought much about sound, either historically or in their own lives, I hope my book can begin to teach them how to listen to a culture and to understand what those sounds have to say. For readers who already possess that kind of sonic awareness, the book can provide a new or expanded perspective from which to consider their own soundscapes. Not just the sounds themselves, but our attitudes toward them.

In fact, when I think about contemporary soundscapes, I'm not convinced that the actual sounds we hear today are significantly different from those heard circa 1930. Are there any sounds as unprecedentedly new to us as was the roar of an internal combustion engine, the crackle and hiss of radio static, or the tremulous whine of a Theremin to those who lived in the early twentieth century?

But even if the sounds themselves are basically unchanged since then, our attitude toward them is very different, and this raises an important question for students of contemporary culture. Circa 1930, the modern sound—clear, direct, and non-reverberant—was considered ideal for virtually any circumstance. It was considered the "one best sound" in an era in which people held great faith in the idea that there was "one best solution" to virtually any problem. Our own post-modern culture is much more skeptical of such claims, and is more eager to embrace a diversity of solutions. Similarly, our post-modern soundscape seems no longer to be about one best sound, but is instead all about choice. Whether it's an acoustically configurable concert hall or a 60 GB iPod with tens of thousands of songs loaded onto its hard drive, we want to be able to pick and choose, even if that means sacrificing some idea of sound "quality." Why is choice so important to us today? I've lived through this change, and my historical awareness has highlighted it for me, but I'm not sure I know the answer to this question. I think I'll leave it for a future historian to answer.

Perhaps a historical understanding of the changes and evolution of urban noise and modes of response to it – whether they be personal, cultural, legal, or what have you – can set the stage for more informed public sector decision-making about the public impacts of the sonic environment. Have you seen any evidence of really effective public sector initiatives for dealing with urban acoustic environments? What forms have these initiatives taken, or might they take?

My investigation of campaigns for noise abatement, as they were characterized in the early twentieth century, shows that these efforts were initiated by individuals who quite simply were bothered by noise. I wouldn't say 'the average man or woman,' because these were socio-economically elite men and women, but they nonetheless believed that they were speaking out from their positions of power to work to improve circumstances for the urban poor, the sick, children, and others who did not hold such power themselves. These noise abaters did enjoy success in mobilizing efforts and resources to investigate, document, and begin to understand the problem of urban noise. They weren't, however, as successful in solving the problem, in getting rid of the noises they identified. In the 1920s, the project for noise abatement was taken over by technical experts, acoustical engineers who possessed powerful new ways to investigate and document the noise problem. They also had some new techniques for eliminating certain kinds of noise, but the task of quieting the modern city was enormous and complex, and here again, success was limited. Noise abatement was a social and a legal problem as much as a technological problem, and the engineers met with only limited success when they attempted to move outside their sphere of technical expertise. In the 1930s, with the onset of the Depression, concern over noise faded away as people had bigger problems to worry about.

The next significant example of grass roots concern over noise would probably be encountered in the late 1960s and early 1970s. At this time, the problem was characterized as 'noise pollution.' It was part of a larger environmental movement in which people were concerned about chemical pollution, litter, and all sorts of other things. In the early 20th century the concern was about the impact of noise on productivity and efficiency, whereas it became a very different kind of problem—an ecological problem—in the 1970s. Additionally, attitudes toward science and technology had changed dramatically in American culture, and I think this also affected how the problem of noise was reconceived. The countercultural movement generally behind the environmental activism of the 1970s was profoundly suspicious of the authority of science and technology. This presented a more difficult social negotiation between the people who were being bothered by noise and the technical experts who might be brought in to help solve the problem. My sense is that the general public did not turn to the technical experts as they did in the 1920s, but that they instead attempted to generate their own solutions. I haven't studied this period to the extent that I have studied the earlier one, but I believe this is where the origins of acoustic ecology are located. Is that correct?

Yes, that's largely correct. We typically trace the origins of the acoustic ecology field to work done by R. Murray Schafer and a group of graduate students at Simon Fraser University in Vancouver, Canada beginning in the early 1970s. Schafer, a composer and educator, published a number of influential pamphlets on noise, listening, and sound. What eventually became the World Soundscape Project later resulted in recordings, books, and articles published by Schafer and some of his former researchers such as Barry Truax and Hildegard Westerkamp.

I don't feel confident that I can offer any specific advice to people who are dealing with problems of noise today, but I think awareness of the historical nature of the problem might help them find a way to best mobilize the resources that make sense for today.

Within your field of sound history, how much of an awareness is there of the work of the Acoustical Ecologists whose writings make up a good part of the literature on soundscape studies?

Sound history is a new kind of history, but I'm not sure I'm ready to call it a "field" at this time. As far as I know, there are no official programs or degrees dedicated to it yet at any universities. Rather, a growing number of historians are choosing to consider the sonic aspects of the past in their work. Scholars in other fields are similarly exploring sonic phenomena and experiences in new ways, and some have begun to talk of a new interdisciplinary field of "Sound Studies," which includes not only historical scholarship but also work in anthropology, ethnomusicology, sociology, communications, and other disciplines. This "field" exists, to date, in terms of interdisciplinary conferences devoted to sound and listening; special sessions at scholarly meetings; and books of essays or special issues of journals that focus on the new scholarship on sound.

I think the works of Schafer and Truax are certainly a starting point for many of these scholars, including myself. For me, these works not only help me to think about sound, but they also serve as invaluable primary sources, historical sources from their own era. Schafer in particular really documents that moment in the early 1970s that we were discussing before, when sound and noise returned to the public consciousness, but in a way that was very different from its early twentieth-century counterpart.

One thing in particular that you very well might be aware of is a thing that Schafer and some others did in the early 1970s – a document that they published entitled 'Five Village Soundscapes.' It's a very interesting study of five European villages, circa the early seventies. They attempted to quantify aspects of the sonic environment around and in these villages – everything from sound pressure level readings, to spectrum plots of the types of sounds that are prevalent in the villages, to 'sound counts' where they actually counted the significant number of contributing events to, say, the traffic noise in the heart of a village. They also did some very interesting sound surveys with the people who live in the

villages and tried to get a sense – both a contemporary and historical sense – of how these people heard and related to their sonic environment; what the important sound marks and components of their sound environment were, and how those things had changed – for better or for worse. It's a really interesting multi-disciplinary study – from a quantified, scientific approach to the more social scientific aspect of the interviews and surveys, to some very beautiful descriptive writing – all centered on these five villages. My understanding is that relatively recently, several European-based soundscape researchers have gone and essentially retraced those steps in order to do an update on the project, thirty years later.

That will all be wonderful primary research for a future historian to draw on! It sounds very similar to my own investigation of the past, except for the fact that I have to interrogate the dead, and am thus forced to turn to historical documents and artifacts, since I can't speak directly to my subjects or investigate directly their environment. The urban noise abatement campaigns circa 1930 did compile similar kinds of data and descriptions, but with less concern for documenting change over time. I wish those early twentieth-century investigators had been more like acoustic ecologists—it would have made my job much easier!

Nonetheless, historians have to be careful not to import their own scientific understanding of how the world works back into the past, into a time when people didn't have that knowledge, and necessarily understood things in different ways. My own technical expertise—having worked in sound engineering and having studied physics and engineering as an undergrad – was clearly helpful in allowing me to get at certain issues and questions about the sonic environment and people's responses to it in the past, but I had to use this expertise with caution, as it can sometimes obscure more than it reveals.

Part of your book focuses on urban noise and modern music, in particular Jazz, the Futurists, Antheil, Varèse, etc. What do you think composers, musicians, and sound artists have to contribute to our understanding of and interaction with our sonic environment?

They contribute so much; it's hard to know where to start. First, musicians, composers, and sound artists enjoy the privilege of calling attention to sounds, of forcing us to listen, to hear something new, or to hear something old in a new way. Most of our listening is not executed in what might be called an "aesthetic" or fully attentive mode. When we listen this way, we listen more carefully and are open to—indeed expect —new experiences. Musicians demand that of us simply by doing what they do, and I think this is tremendously important.

Musicians further possess the unique power to turn noise into music, and by doing so they can take a culture's sonic dross and turn it into gold. The so-called noise musicians of the early twentieth century taught people new ways to hear the noise of the modern world. They aestheticized the urban soundscape, and for some listeners, this constructive approach was a far more successful way to "deal with" noise than were the many destructive attempts to eliminate or abate those same noises.

Finally, for sound historians like myself, music constitutes a wonderfully rich resource for understanding sonic cultures of the past. Musicians' intentions, as well as listeners' responses—both pro and con—provide valuable clues for understanding how people listened, and what they heard, in a sound world that no longer exists.

What is the significance to the general public of gaining an understanding of their relationship(s) to the sonic environment, i.e. why should they be interested, what's at stake for them, particularly in urban settings?

I suspect the primary pragmatic issue for most people in urban settings is—again—the problem of noise, and I hope my work helps people understand that that noise, by its very subjectivity, is as much about power and politics as it is about sound. Whether people are complainants or defendants, the noise at stake is often really a sonic index for fraught social relationships or unbalanced power equations, and the sooner that people are aware of this fact, the better equipped they will be to press their claims, or defend their rights, in support of the sonic environment they desire.

Can you recommend the work of any other writers and researchers in your field that might be helpful to people in the acoustic ecology field?

Scholarship in sound studies has flourished in the past 5–10 years, so now one could easily fill a shelf with a really nice collection of books that could be read with benefit by anyone interested in thinking about sound, history, and culture. My own shelves include about a dozen books specifically in history, and many more in other disciplines. The primarily historical titles include: Alain Corbin, *Village Bells: Sound and Meaning in the 19th-Century French Countryside*; James Johnson, *Listening in Paris: A Cultural History*; Douglas Kahn, *Noise Water Meat: A History of Sound in the Arts*; John Picker, *Victorian Soundscapes*; Richard Rath, *How Early America Sounded*; Bruce Smith, *The Acoustic World of Early Modern England*; Mark Smith, *Listening to Nineteenth-Century America*; Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction*; Susan Douglas, *Listening In: Radio and the American Imagination*, and Trevor Pinch and Frank Trocco, *Analog Days: The Invention and Impact of the Moog Synthesizer*. Three edited volumes that can also serve as useful introductions include Veit Erlmann, ed., *Hearing Cultures: Essays on Sound, Listening, and Modernity*; Mark Smith, ed., *Hearing History: A Reader*; and Michael Bull and Les Back, eds, *The Auditory Culture Reader*.

What do you think this increase in attention to sound within the academic community signals in terms of more widespread cultural interest in the sonic environment?

Perhaps—returning to a point we discussed earlier—it's a response to the abundance of recorded sound that digital media technologies have recently made available. The world has been stockpiling recordings ever since Edison invented the phonograph over a century ago. Now, with compression algorithms and the Internet, we have new and powerful means to make all that sonic material available to very many people with very little effort. Just as the sonic culture of the early twentieth century was shaped by new technologies of control, our own sonic culture may be influenced by these new technologies of access and choice. We have so much sonic material at our fingertips today; perhaps we feel the need for a better map of the sound world, including our sonic past. With such a map, we will hopefully be better equipped to navigate a path through all the sounds that surround us, and to chart a course toward the best possible sonic future.

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Sounds From Dangerous Places: An Interview With Peter Cusack

By Angus Carlyle

Peter Cusack is a sound artist/recordist and musician with special interests in environmental sound and acoustic ecology. He is particularly interested in global patterns of sonic change created by migrations of people who make and create them and by new technologies. In 1998 he initiated the on-going 'Your Favourite London Sound' project, which aims to find out what Londoners find positive in their city's soundscape.

The first question I'd like to ask about the Sound From Dangerous Places project is what, for you, constitutes a dangerous place?

My original idea was that these were places of major environmental damage—not necessarily a place that is dangerous to one personally (although it may be that too). Essentially the project came out of specific journeys that I'd undertaken, particularly one to Azerbaijan. There I went to the oil fields that are just outside Baku, the capital city; these are the oldest oil fields in the world and are consequently one of the most polluted spots on earth. The area, called Bibi Heybat, is beside the sea, so both the sea and the land are saturated with oil. It is also near relatively large towns and villages. Refugees, who are denied land elsewhere, are forced to live and graze animals in the oil fields. Its impact on local people is extremely marked.

What motivated you to explore these places?

Again, it came out of that experience. Despite what I've just said about the pollution and related problems, it is also one of the most photogenic and sonogenic places that I've ever been to. From an aesthetic or artistic point of view it looks and sounds fantastic. The sound comes from the fact that it is still a working oil field, with hundreds of nodding-donkey pumps going continually, each of which hums and squeaks in its own little way. They are often quite close together. So the atmosphere is of working machines humming and squeaking repetitively for as long as they can stand up, and some have been running for decades. So to walk around there is a sonic experience. It is not that far off sounding like a genuine piece of electro-acoustic music in its own right; in fact my recordings of the oil fields have been mistaken for compositions. So it sounds great. It looks great, too, many of the structures have been there for such a long time that they have decayed and fallen into spectacular heaps of metal, either rusty or blackened with oil. The light, too, is special: the sky is blue, the sea is blue and the soil is yellow where it's not black and the various structures are reflected in pools of oil waste. So it is a very beautiful site if you ignore all the social, political and economic things that can be said.

What were the other locations that you have chosen to investigate under the broad theme of Sound in Dangerous Places?

The main issue for me after experiencing the oil-fields was the extreme dichotomy between my aesthetic pleasure at seeing and hearing this place and the knowledge that it was extremely polluted, created health problems for the local people, had a major impact on Azerbaijan's social and political system, the structure of its economy and exerted a wider, global, effect in terms of oil supply. I wanted to see if other dangerous places possessed this dichotomy so immediately I thought of Chernobyl. Another place is the region of Eastern Turkey where the source rivers of the Tigris and Euphrates rise in the mountains. Nineteen dams are to be constructed here. Dams have a devastating impact on local microclimates; in other words, they destroy vegetation and change rain or snowfall patterns making it a dangerous place from an environmental and ecological perspective. It is also a dangerous place from the point of view of there being a low-level war between Kurdish guerrillas and the Turkish Army.

In the UK, as well, there are 'dangerous places'. For example, in North Wales, where fallout from Chernobyl fell, there are still restrictions imposed on farmers in order that they can rid their sheep of radioactive caesium. This is twenty years later and the restrictions will still probably be in place in another 20 years from now. Other aspects of dangerousness in the UK can be located in the vicinity of major military installations, like the American air bases of East Anglia. The interesting thing is that military bases are also people exclusion zones, which means that they effectively become wildlife reserves. So even though the place may be littered with unexploded ordinance, nonetheless, they are havens for wildlife, which is reflected in the soundscape. Another 'dangerous place' I recorded in the UK is the borough of Uttlesford, where Stansted airport is located. It is the borough that produces the most domestic carbon dioxide per UK household. And yet, when you go there, you hear church bells and the usual affluent stockbroker belt cum rural soundscape.

If all dangerous places were characterised by an absence of sound then you could say that dangerous places are associated with a particular, eerily silent soundscape. From what you are saying, it is not as simple as that; dangerous places have very diverse soundscapes.

Yes, that's right. In Turkey, for example, there *is* an absence of sound. With the de-forestation connected to the dams, the wildlife disappears, the land is flooded so there is no low-level farming activity, the bee keeping has to go elsewhere and the villages are inundated so the people and their sounds depart, too. Instead of the roaring of the river you get a gentle lapping of the lake. In Chernobyl, the opposite has happened to the soundscape, the wildlife has come in to replace the evacuated people. Nature seems to have recovered far beyond anyone's expectations and animals that haven't been seen there for a hundred years are now back.

Does the diversity of soundscapes associated with dangerous places pose particular problems for you when you come to present this material?

Very much so, because getting the idea across requires explanation in addition to the recorded sounds themselves. That explanation can be visual or spoken or written. This project has presented me with the challenge of using media that I previously haven't employed; this is as yet an unsolved problem.

One of the other consequences of going to Azerbaijan was meeting Ursula Biemann there. She is a Swiss video artist, more particularly, a geo-political artist, whose interests have been in borders: in the mechanisms involved in the legal and illegal transport of resources and people, in the differences in economic development either side of borderlines and in the philosophical, sociological and cultural issues that underpin those processes. We collaborated on two projects, one on the architecture of Baku as a city and another, *The Black Sea Files*, an exploration of the Baku/Tbilisi/Ceyhan oil pipeline that has been constructed to bring Caspian oil to the west. This is very much her piece—my role was in finalising the video sound—but working with her was extremely valuable in introducing me to areas of geo-political art that I wasn't aware of before.

Looking at such work didn't change the way I hear the soundscape but they did persuade me to make a wider range of recordings, particularly interviews with people. The whole thing has turned me into more of a journalist than I'd ever imagined I'd be! Moreover, these experiences inspired me to conduct much more detailed research into the contexts of the places I was exploring, producing even more material to deal with. So it has been a blessing and a curse, but ultimately a good thing.

How would you relate your Dangerous Places project to your previous work?

Almost all of my soundscape work has been focused on place and the way we respond to place through sound. One of my previous projects, *The Favourite Sounds of London* was quite a detailed attempt to get at what Londoners found positive about the London soundscape. *Sounds from Dangerous Places* is kind of a logical extension from there. It is not quite the same since it is more overtly political and deals with more global structures, yet, because it is me, it still has the sonic bias.

What will happen to the focus on positive sounds that was represented in some of your previous work?

The Favourite Sounds of London was started in 1998 and is now almost nine years old. In 2005, I had the opportunity to do the same project in Beijing. There is also a group originally based in the School of the Art Institute of Chicago who are extending the Favourite Sounds idea to Chicago (http://favoritechicagosounds.com). So similar projects are being pursued in different cities. Because the same questions are being asked, the material is comparable and that has generated a lot of interesting, often unexpected, results. For example, the way that people spoke of sound in Beijing seemed noticeably different from the way that Londoners described their relationship with sound. In China, they were more poetic or metaphorical in their appreciation of what sounds of the city meant to them. This alerted me to the cultural differences that there must be in the way we think and feel about our sound environment. In one sense, of course, those differences should have been entirely expected, but it has taken me fifty years to appreciate the point!

One of the things we are told, from a variety of sources is that as the world globalises, it becomes more homogenous. That may be true of the visual field, if we think about signage, for example, but what about the field of sound?

I would say that the more I travel the more homogenous sounds do seem, although that process is by no means complete and there are vast and interesting local differences which one can only hope are maintained. The most ubiquitous sound now is traffic noise and that sounds pretty much the same wherever you are—although there are local variations even in that. As traffic noise increases and becomes dominant, generally, homogeneity increases and there is a parallel with new communications technologies. There are mobile phones and electronic bleeps of all kinds that you hear all over the world. Traffic also masks out many of the smaller sounds that give places their character.

Music is seemingly becoming more homogenous. Drum machines, for example, have conquered the world and while these may be producing different rhythms, the individual sounds themselves are unfortunately similar. The same can be said of synthesisers.

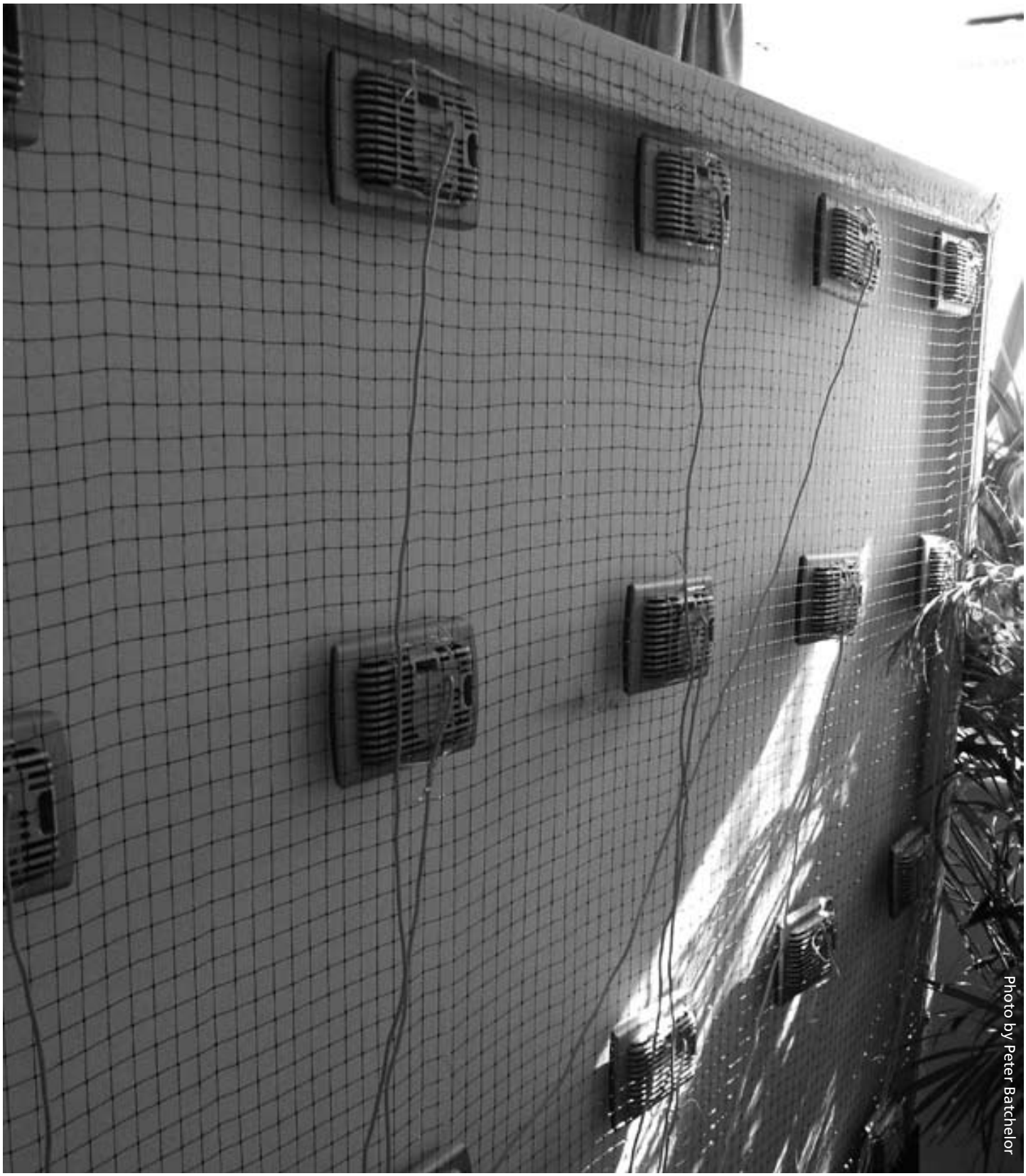
Do you have a new place in mind that you are looking forward to exploring?

I've decided to stop travelling for a while in order to use the material I've already accumulated. The next task is to create new work from this material.

That said, I'd like to travel the length of the Tigris or Euphrates River. One of the reasons is that these waterways are historic in terms of their relationship with the origins of organised human habitation. Everyone knows of the terrible political situation in the Middle East; yet less known is the issue of water, which in a hot, dry area, is possibly more of a significant resource to the local populations than oil. At the other end of those rivers are the deltas that flow into the Persian Gulf and the Shat Al-Arab; these areas are home to the Marsh Arab peoples, terribly persecuted under Saddam Hussein. The United Nations Environmental Programme has attempted to restore the marshes that, under Hussein's instructions had been drained to twenty per cent of their former size. They have succeeded up to a point. However what impedes more progress in the restoration is now not anything to do with Iraq, but rather with how much water Turkey and Syria allow to flow down the waterways. What interests me is that the watersheds present very clear-cut ecological and environmental systems from source to mouth, which have political, cultural, sociological effects all the way down the line. As a complete, self-contained system it has many interlocking elements that allow one to make general points about the relationship between ecology and human society. These, I think, are the issues of this time; and while these issues can be explored from a variety of perspectives, for me, it is sound that is the way in.

This interview also appeared in Autumn Leaves: Sound and the Environment in Artistic Practice*, a book edited by Angus Carlyle, published in 2007 by Double Entendre and Creative Research into Sound Arts Practice (http://crisap.org).* *See review on page 48.*

Angus Carlyle is a writer, academic, and artist who explores the interfaces between technology, culture and creativity. He is Co-Director of CRiSAP.



Studies on Canvas (2004) by Peter Batchelor

Peter Batchelor's *Studies on Canvas* (2004) is a fixed medium installation comprising 30 flat-panel speakers behind a blank canvas—essentially a physical acousmatic curtain which obscures a series of sonic 'images'. The work is thus concerned with visual/aural metaphor: as with a painting, the images represent landscapes, scenes, (moving) still-lifes, and the (sometimes imaginary) inner detail of objects. As such they rely heavily on referential material and spatio-behavioral emulation in their realisation. The listener is invited to engage with the work as with a painting, standing back to see the full picture, standing closer to appreciate the inner spatial/textural detail. While the 'frame' represented by the canvas abstracts the material from its purported context, in many ways the idea is to transcend it altogether, creating a virtual window on the real, with the canvas contents being often practically indistinguishable from reality. Ultimately, the work represents a coming together of acousmatic and soundscape compositional concerns and has prompted extensive further investigation into issues surrounding the fabricated aural landscape and trompe l'oreille (see 'Fabricating aural landscapes: the referential and trompe l'oreille in multi-channel installation contexts' (EMS07, **http://www.ems-network.org/spip.php?article289**). *Editor's note: Peter's paper, mentioned above, was the slated to be included in this issue; unfortunately, we didn't have enough space. We are pleased that EMS is making it available.*

Language of the Listening Body

By Michelle Nagai


Photo by Ian W. Douglas

The Language of the Listening Body is an ongoing research project I created in partnership with choreographer Hope Mohr. In September 2006, a small group of dancers joined Hope and I for an intensive two-week workshop that marked the start of the project. Meeting daily, we conducted listening and movement research and a number of soundwalks at various points in midtown Manhattan; along the far west side of Manhattan; beside the Hudson river; and along the East river in Long Island City, Queens.

Nine dancers joined us on that first exploration, along with special guests composer Pauline Oliveros, NYC noise activist Arline Bronzaft, and choreographer Barbara Dilley. The Interdisciplinary Laboratory for Art, Nature and Dance (iLAND), an organization that places collaboration between artists, scientists and the environment at the center of its mission, provided the initial jump start for the project and funded our September workshop.

The following text is culled from soundwalk journal entries I made during the first phase of my work with The Language of the Listening Body. I have also incorporated some comments made by other members of the group during our post-walk discussions. My notes and recollections correspond to several different soundwalks. On most of these walks I was joined by members of the project along with my then three-month old son Uta.

Pulaski Bridge to Gantry Plaza State Park, Long Island City, Queens, Private Soundwalk on 8/11/06:

Under the drawbridge, LIC side. Quiet without cars. A boat passes under, then the bridge lowers, warning signals and the barricades go up, then cars again. There is a great resonance under here. Sounds echo off a neighboring building. The car traffic hum and blur quickly blends into the overall soundscape.

The water on the creek is very gentle, delicate. Pigeon wings click occasionally, tapping randomly. Good open space for movement.

I like the idea that our movement gets more active as the walk progresses, starts slow and lets the ear warm up along with the body. I like the idea of us walking in a line.

Homeless guys, shelter dwellers, hanging out in the park. I hear a cicada! Still the hum of the traffic. I cross the "strip" on Vernon, to 50th Avenue. Down 50th still more businesses and homes. Then I'm nestled between large buildings, tall architecture. Drones, drones, drones. The sense of a canyon, of walking into a canyon.

At the end of 50th Avenue, I continue straight into the fisherman's pier. The street just becomes the pier. Keep going and I'd be swimming. Then there is the rest of the park to explore…

Thinking about my own ecology. I am proud of the ecosystem into which my life fits in this moment, sitting on a bench, in a park, overlooking the East River. It's an ecosystem that accommodates a new mother and her small child moving through it. An ecosystem that makes space for the living and being, where we can shape things and move and survive with the simplest tools. Just me, and baby, pen making notes on paper. Moving in the soundscape, participating in the momentary and ongoing ecosystems of this space. Thinking about inclusive listening. Listening that has physical, temporal, spiritual and emotional dimensions.


Photo by Ian W. Douglas

Photo by Ian W. Douglas

9/17/06 Thoughts Re: Bryant Park to Grand Central Station Public Soundwalk on 9/16/06:

There is a disconnect that happens for me between my sensation as a listener/mover on a soundwalk and me as the facilitator of this project, as a "researcher." I miss the feeling of expansiveness that I sensed in the planning stages, or on the day when I walked the Long Island City route and sat in the park with Uta. At that time I had a feeling like the process of the project itself, not only its content but its form, was an expression of my own urban artist ecology. But something seems to have shut this down. It's like somebody threw a dark sweater over our heads. Openness and inclusiveness was replaced with restriction, limit, hurry and exhaustion, culminating in this last frustrating and difficult walk through midtown.

I wonder if part of the problem, or at least one source of what I experienced as a negative, was the location – midtown Manhattan. Intense noise, far from home, no respite, even our park space taken over by fashion week. Nowhere safe for us to pause, to catch our breath or just be still. No quiet!

In the plaza just south of Grand Central on Park Ave. there was an odd sensation of being on the spot, watched and surveyed, mainly by concerned security guards. It was a non-welcoming, begrudgingly public space. At that point, we all became small, constricted in our listening. The security guards did crank up the fountains for us though, adding layers of white noise to the stream of traffic below and the grinding of air compressors against the façade of a building overhead. But it was hard being there.

There was one brief moment of respite inside the great hall of Grand Central Station. We gathered into a small cluster, dancers and public participants. Slowly, slips of paper were passed from person to person. "Listen at the limit of your hearing", pause, "Listen to the resonance of the hall", pause, "Listen to the sound of the person next to you" and so on.

Bodies standing close, soft focus listening, looking up towards the ceiling/sky, soft focus eyes dart from one spot to another: Something dreamy, resonant, echoing and of unidentified origin.

Our group cluster created a nice sense of reconnecting after having dispersed quite a bit along the walk. Good thing, because moments later, as we emerged from Grand Central, we stepped right into major road construction, with multiple jackhammers and heavy equipment, at VERY close range. A few minutes later, just steps before the end of the walk, we passed a tiny fountain in front of a restaurant and everyone noticed the calming effect this had on our listening and our nerves.

9/18/06 More Discussion Re: Bryant Park to Grand Central Station Public Soundwalk on 9/16/06:

The group agrees: This was a big leap – asking the public to make dance in response to sound. Letting go of the soundwalk structure is important. Learn how to distinguish "soundwalk time" from "dance time". Allow people to do what they want during the walk.

Somebody comments: What's the relationship between an activist stance (teaching listening, fighting noise) and creative expression and performance (live dance improvisation, public performance on the street)?

I ask the group: How does this work feed our creative process? Can we use our research as creative resource? And, how does it contribute to an ecological relationship to the urban environment?

Someone else comments: Dance's vocabulary is not relevant—listening is a very different process from dancing.

Walking or waaalkinnnnnng. Can anyone tell that you are walking in time with some unidentified rhythmical drone? Does it count if no one can hear it but you? Can you hear a sound better when you move to it?

Pulaski Bridge to Gantry Plaza State Park, Long Island City, Queens, Private Soundwalk on 9/19/06:

Walking, performing, listening (not sure what we're calling it) along the route in advance of Saturday's public soundwalk. Fatigue has set in. I am without my baby today. I am lulled by the breeze and the gentle water lapping at the rocks on the shore, moving things in its wake. I hear metal and wood sounds, the piers rattling and squeaking gently in the sway. We've been walking for almost two hours.

Am I aware of my community? Am I listening?

Overhead a helicopter is hovering. A gull pierces the air, his mouth is full. George Bush is just across the river at the United Nations building. The water is buzzing with patrol boats, the sky full of helicopters and surveillance of all sorts.

My own private language of listening and meaning is emerging. A gesture language, part visceral response, part intellect. Emotional and also instinctive:

- Hands interacting, slapping or holding each other: Human voices, interactions, conversations.
- Small fluttering in dropped hands and fingers: Something tiny, natural world, vulnerable, children.
- Slow, heavy shifting of weight, slow walk: Deep, low throbbing, like a train engine.
- Solid, open hands, full contact, all energy passing through: Heavy, deep, low, powerful sounds, like unidentifiable drones.

Pulaski Bridge to Gantry Plaza State Park, Long Island City, Queens, Public Soundwalk on 9/23/06:

Something beautiful about this walk, something I really loved, was watching people explore and take risks. Watching members of the general public move beyond just walking and actually dance. Watching people play with sound from within their bodies.

I also enjoyed noticing the "look" of the listening body, as Hope likes to refer to it. People listening have a very distinctive appearance. Our bodies record the actions of our ears in subtle and not so subtle gestures and postural shifts. We orient ourselves through our listening, and we move in response to the sound field, even if unintentionally. And then we communicate this experience. This is the language of the listening body.

Listening: Slouchy, tense, slow, dense, aware, present, on the edge, ready, alert, soft, hard, clustered, alone, deep, maybe, extended, open.

Comments from other participants in the series of workshops and walks:

Jennifer Monson: Action or reaction balances out the ecology of the moment. Activates the subject as a part of the ecological sound system. Creates a sense of balance, changes a power dynamic, empowers? An example was given from the day before when the group had danced past a garage full of men who were calling out to the dancers. Alejandra mentioned that she felt so present, so grounded and in her context that she wasn't pulled out of herself into a self conscious or reactive mode but could keep in her animal sense of security and sharp awareness of her surroundings habitat. Like an animal—quiet, grounded.

Alejandra Martorell: Even though the first sound-walk was, for many of us, difficult, I loved it. I loved the difficulty of it, the rawness with which we tackled it, being almost not ready for it. I love it in comparison to the second one. The one made the other one in many ways. To have both is to know more about what we were doing, even if it's still hard to know exactly what that might have been. . . . One assumption about audience participation is that is a step down from the pure, performative qualities of the artist's focus. In the sound-walk, I had the opportunity to examine my feelings about this. I was aware of opening up to my partner's company—his responses, initiatives, observations, proposals, etc.—while keeping my presence of mind with my own way of navigating the moment, including listening and following my physical movement. It became lighter somehow, less intense, more ample in focus, more playful and, in a way, more real, because by being an openly shared experience, it became part of normal living and everyday moment, even though we would never find ourselves moving and looking and feeling the way we were.

Biba Bell: Bringing myself to meet the music of the city I focused my dancing, listening body on the cross-town traffic, the children in the park, the smattering of bird sounds invisible in havens of trees, the sound of my own breath and footsteps next to me, the geometric valleys and peaks of midtown, the oasis of the orchid store on 42nd and Park, and the sky expanse of helicopters on the waterfront. To dance with this sound is truly a way to open up the little ears that inhabit each and every cell. The sounding of the city in my body makes it move.

How much sound can go through these limbs?

As I move through sound I give my ears a rest—like Hope was saying, moving can be a rest. I am able to participate with the soundscape for greater duration, I reach into the soundspace more, I am supported by this soundspace. The potential harshness of urbanity is toned, movement is this tonic. . . Sound can be a command, a perlocution. I respond with movement, and involve myself—it is a dialogue.

Laura Hymers: Listening or looking directly, softly, peripherally, in between . . . This is a wonderful game-like experiment that I find myself using in rehearsal and in simply walking on the street. Not changing the way things (cars, people, dancers, etc.) are, but having the choice to change my relationship thru eyes and ears.

Lisa Brenner: What happens in a playground when a group of 12 adults say to themselves "it is ok if I end up rolling on the ground" What happens in a paranoid country when 30 adults stand silently, single file, on a bridge over one of the major tunnel entrances to Manhattan, standing, no less, over a huge flashing sign: report all suspicious activity.

Who knew there was a symphony of birds waiting behind the parking lots on that particular half block of 50th Ave. in LIC? Maessian (however you spell his name) would have been enthralled. . .

So there was this mixture of high art/present moment/concept/walking along the dirty pavement wondering just how bizarre DID all this appear to the non-listening New Yorkers just trying to get things done, as I stood there, listening.

More writing on The Language of the Listening Body, including the full posts from which the above comments are excerpted, are available at the Critical Correspondence website: http://movementresearch.org/publishing/?q=node/119

Michelle Nagai is a composer who lives in nyc. She is on the board of the American Society for Acoustic Ecology and is a founding member of the New York Society for Acoustic Ecology (nysae). She is also a certified Deep Listener.

Photo by Ian W. Douglas

The Appreciative Ear: Sounds from the Ground Up

by Margaret Sabom Bruchez

I know of no more fitting way to show appreciation and gratitude than by helping others to understand, appreciate, and be grateful and by encouraging them to cherish and preserve whatever seems most worthy of being loved or admired.

— from *Life Ascending* by Alexander F. Skutch

The hills are alive with the sound of music that increasingly falls upon unappreciative ears. It is the claim of this article that an appreciation of underground sounds can spur real, relevant responses to the environmental crises of our time. When people are educated in the earthly sounds, their sources, and benefits, they are more inclined to feel a sense of obligation to steward the earth. The focus here is on sound artists and acoustic field researchers and scientifically measuring the sounds. Sounds underfoot, more than any other category of sensate phenomena, teach appreciation by beginning at the ground level.

To appreciate—not simply find pleasing—requires a thoughtful mind. An appreciative mind, as Alexander F. Skutch (1985) puts it, is an instrument on which the cosmos plays its tunes. Many enjoy the music, but only a few are prepared fully to appreciate the accomplished performance. According to the naturalist and writer, being appreciative is the equivalent of having studied music enough to recognize the technical excellence of the compositions and competence of the musicians and having reflected upon the long years of training and practice necessary to develop the skills. To enlarge upon Skutch's words, the appreciative ear hears in the underground the tunes that represent what the creative energy of the cosmos can accomplish when it finds the right conditions.

Ground melodies animate mountainsides, rock faces, and hills, alike. But the sounds are cultural and natural resources people are not sufficiently aware of to protect. At the simplest level, the sounds are acoustic signals, or disturbances involving mechanical vibrations in solids, liquids, and gases. Triggered in the underground as a result of natural processes—i.e. thunder, water movement, wind, barometric pressure change, wildlife, an earthquake, hurricane, tsunami, or volcano – the sounds are not easily dismissed. Animal responsiveness to the noises is innate, but an appreciation of their value results from a sensory attentiveness that is dependent upon teaching and cultural influence. Until now the requisites for appreciation have been passed along in rumors, anecdotes, legends, and myths. Knowledgeable people accept the obligation to preserve the information about the sounds that will nourish future generations of appreciative minds.

In the following paragraphs I point out several ways sound artists and acoustic field researchers prove vital in efforts to prioritize, using science, the relationships individuals and cultures maintain with underground soundscapes with respect to the past, memory, place, identity, community, and traditional cultural practices. Sensed, either as sound or vibration, natural sounds whose source is underground are codified or metaphorized into meaning in a variety of cultural contexts. The concerns addressed have developed in a study that considers natural sounds in a fundamentally new way. Soundscape is regarded here as a concept that articulates the way communities understand and engage in musical relationships with the underground, geophysical world. Considering the earth in terms of ecology of natural processes and cultural sound forms of music allows the traditionally subjective topic of ground melodies to be approached scientifically.

The Problems

Scant information has accumulated in the literature about traditional knowledge and wisdom of the geophysical landscape; next to nothing is published about natural underground sounds. Several reasons exist, chief among which are the limits imposed by western science. Legends and anecdotes transmit the knowledge, but are judged as fantasy and not as legitimate subjects of objective scientific research.

Offset by the restraint with which science operates, the tenacious hold people have on their traditions points out how much scientists have to learn. For example, scientists are discovering that sounds generated underfoot offer some of the only tangible clues to how the earth's geophysical processes operate. The problem for scientists is not in knowing how sound waves travel underground: they are transmitted like their counterparts in the air. Instead, the underground contexts are compositionally complex and challenge scientists' attempts to measure the sounds. In the case of seismic waves, for example, velocities vary (due to rock type) and frequencies are outside the range of human hearing. Even when they are audible the sounds are intermittent and unpredictable and overwhelm the existing capacities of recording devices.

Collecting the audible underground sounds implies knowing where they occur. Characteristically, material evidence of the occurrences is absent. More often the noises are barely audible and perceived in solitude or small assemblies. Occurring in contexts that restrict admittance—like passageways and crevices—limits are placed on activities and equipment when hearing and recording the sounds is the intent.

The Importance

Sounds are subjective, sensate ways of human knowing, and far exceed the benefits of seeing: hearing is omni directional; vision is unidirectional. Underground sounds are complex and multi-faceted occurrences that amount to "soundmarks" (c.f. Schafer 1977), a term used to typify sound phenomena that epitomize specific places. As Murray Schafer explains, soundmarks express a location's identity—like architecture and dress—to the extent that people recognize and characterize a place by their presence. In the underground the natural sounds mark locations where, for millennia, individuals have connected with the earth's natural powers—intellectually, emotionally, and physically. The sounds transmit messages that, when

put into narratives, are passed along to members of the culture. Mimicked in narrative form the sounds reinforce social norms and sometimes warn people of trouble underfoot.

In the U.S. protection of sounds is stipulated by the Antiquities Act (1906), the National Historic Preservation Act (1966), and the Archaeological Resources Protection Act (1979). As cultural and natural resources, sounds are preserved and maintained for the benefit of future generations, if they have the potential to yield information important in history or prehistory or concern activities of archaeological interest. Eligibility extends in the same way to intangible resources, such as cultural expressions, natural sounds, songs, stories, and practices concerning nature and cultural spaces as it does to tangible materials, such as buildings, structures, sites, and natural landscapes. Eligibility for inclusion in the U.S. National Register of Historic Places, for example, is prescribed under Section 106 of the National Historic Preservation Act (NHPA), regardless of whether material evidence exists for the occurrences of events or activities associated with the beliefs and views. Likewise, UNESCO recognizes locations as World Heritage sites, along with the associated local tradition bearers, traditional artists, forms of cultural expression that highlight oral traditions and expressions, performing arts, social practices, rituals and festival events, and knowledge and practices concerning nature and the universe that need to be safeguarded as a means of ensuring the cultural diversity in the world.

Examples

Cultures establish and reinforce differently the importance placed upon underground soundscapes. Some natural sounds in the underground are linked to beliefs of cultural origins, histories, or views about the natural world. Jicarilla Apache in northern New Mexico, for instance, assign life and language to the geophysical landscape: "You must consider rocks to be alive as much as you consider our bones to be alive…" (Opler 1994: 110). Flint Mountain is believed to be the result of efforts of turkey that gobbles and struts: "Every time the mountain grew there was a noise as though something was squeezed, a squeaking noise" (p. 17). Thunder Hactcin (one of supernatural beings that personify the power of objects and natural forces) is sent to live in the mountain, along with his groaning stick fashioned as a bullroarer by Lightning Hactcin.

The United States Geological Survey (USGS) reports that strong earthquakes affect the area and are accompanied by rumbling, loud subterranean sounds (2006). Calling to mind the thunder in rainstorms, Thunder Hactcin is told, "When you make your thunder, when the people hear you, they will all be happy. The noise will spread and everyone will be happy. They will say, "Grandfather, we like to hear you every year… but you must not come near to us. . . you must go around and above us, but you must not strike close to us" (p. 166).

Underground sounds are known to represent outstanding value from historical, artistic and ethnological points of view and reinforce the cultural identities of tradition bearer communities. With more than 350 miles of surveyed passageways, for instance, Mammoth Cave in hilly south central Kentucky is the longest recorded cave system in the world. Archaeologists document cave use dating back 4,000 years. National park authorization is extended in 1926, designation as a UNESCO World Heritage Site received in 1981, and the cave is named as an International Biosphere Reserve in 1990. The acoustical charm of the cave is described in Horace Carter Hovey's early 20th century report of Echo River:

> …the symmetrical passageway does not give back a distinct echo, as the term is commonly used; but gives a melodious prolongation of sound for from ten to thirty minutes after the original impulse. The tunnel has a certain keynote of its own, which, when firmly struck, excites harmonics with tones of incredible depth and sweetness, the lowest of them reminding one of the profound undertone heard in the tremendous music of Niagara.
>
> The most extraordinary effects are produced when Echo River is allowed to speak for itself, and can only be had when the party is willing to maintain utter silence….The first sound to break the intense stillness is like the tinkling of myriads of tiny silver bells. Then larger and heavier bells take up the harmony…Then it is as if all chimes of all cathedrals had conspired to raise a tempest of sweet sounds. These die away to a whisper, followed by mutterings and a noise as if of an angry multitude, mingled with unearthly shrieks…Lo, as if from some deep recess that had hitherto been forgotten, comes a tone tender and profound; after which, like gentle memories, are reawakened all the mellow sounds, the silver bells, the alarm bells, the chiming cathedral bells, till River Hall rings again with the wondrous, matchless harmony (Hovey 1912: 84–85).

Mammoth Cave, Kentucky, USA

Ralph Waldo Emerson is inspired by the cave's Star Chamber and pens the poem, "Illusions". Emerson admits, "The mysteries and scenery of the cave had the same dignity that belongs to all natural objects, and which shames the fine things to which we foppishly compare them. I remarked, especially, the mimetic habit, with which Nature, on new instruments, hums her old tunes, making night to mimic day, and chemistry to ape vegetation" (Emerson 1860, 1876).

Sounds are an important focus of the first published accounts of the effects on the cave of the 1812 New Madrid earthquake. Accounts by workmen reveal that "five minutes before the shocks came on a heavy rumbling noise was heard coming out of the Cave like a mighty wind" (Ward 1816). Coupled with the Great Comet of 1811, the earthquakes and sounds inspire superstitious doomsday seers, miners, slaves, supervisors (Penick 1981) along with lantern-wielding black guides (Lyons 2006). The revivalist movement at the time swells with members called "earthquake Christians" (George and O'Dell 1992).

Underground sounds, mentioned in legends and myths, often refer to actual geophysical events. For instance, legendary accounts describe the earthquake that accompanies the famous descent of the Archangel Michael and his temporary dwelling in the sacred cave at Monte Sant'Angelo, Italy. Some claim the sacred legend is the most important one of the medieval western world, having influenced the cultural evolution and spread of Christianity to Europe; the local sanctuary has become one of the most important sites of religious pilgrimage (Carletti and Otranto 1994; Fischetti 1991; Piemontese 1997 in Piccardi 2005: 121). The earthquake associated with the legend is dated by tradition, AD 493 (e.g. Baratta 1901; Bonito 1691; Mercalli 1883, in Piccardi 2005: 121) and corresponds

in remarkable similarities to the location of actual ground ruptures. According to seismologist Luigi Piccardi, "Natural phenomena that occurred during the earthquake along the fault, strange underground rumors [loud roars or rumbles], lights and lightning, and in particular the opening of secondary ruptures" are unusual occurrences that suggest "the origin of the veneration of the place of the apparition of the Archangel Michael slaying the dragon as it emerges from a flame emitted chasm in the earth (Piccardi 2005:126).

Underground sounds are perceived where destructive events occur in the past and are frequently assigned to primary powers. The destruction is believed to follow the breaches of accepted norms and rituals and the occurrences of sounds merely reinforce the social moral codes. Mythological characters said to be responsible for instigating the sounds help establish the cultural perspectives and meanings of catastrophic events.

As McMillan and Hutchinson (2002) explain for the indigenous residents along the Northwest Coast region of the U.S.:

> Mythic accounts tell of the ancient past, when powerful transformers put the landscape and the animals into their present forms. Historical narratives set in more recent times also help to situate the people on their landscape, reaffirming their lengthy ties to the lands they occupy. These oral traditions also recount details of past natural catastrophes, including earthquakes and tsunamis that affected this region. Although they may not meet modern standards of scientific rigor for the study of such phenomena, the oral histories reflect the experiences and perceptions of aboriginal peoples in their lengthy occupation of this land. They provide, along with the archaeological record of the Native past, our only insights into the impact of past seismic events on human populations in this region, prior to about two hundred years ago (p.41).

Roughly 1,000 earthquakes are recorded per year in Washington and Oregon, most occurring in the Puget Sound region. The area, along with British Columbia and northern California, is considered as the Cascadia Subduction Zone.

Discussion

Traditionally, people learn to appreciate the earth's underground resources through stories and songs that teach about relationships between humans and natural world sounds. The lessons they pass along are beginning to be legitimized through scientific inquiry. Seismologists, for instance, report that underground seismic signals (vibrations) cause the earth "to ring like a bell" (Garcés et al 1998; Garcés 2003). Extracted from their effects, scientists employ the signals' mechanical elements to record the changes and track activities of quakes and volcanoes. Members of the growing discipline of acoustic seismology (Dombois 1999, 2001, 2002) study naturally-caused ground vibrations to understand the development of faults. The aural facets of seismic wave motions are recorded on seismographs and transferred to spectrograms. This enables the tension in subterranean structures existing in the past to be aurally compared with current conditions (Dombois 2002).

Loud, hushed, plaintive, or shrill, underground sounds often animate underground contexts. They can be equated to human expressions of emotions and moods, in that they evoke feelings of awe, introspection, and wonder. By utilizing the "aural models" and resulting sonic self-explorations (c.f. Levin 2006: 62) one learns to appreciate the earth's resources.

For example, some residents in earthquake-prone areas of Central America compare the earth to a drum. The sounds that result from seismic activities follow a musical beat (Sabom-Bruchez 2007). Resonance and reverberations form separable units of auditory waveforms and are easily repeated and reproduced: chanted, the singers are able to connect with the natural processes. The legendary carrying out of song rituals at location of underground springs are believed by the Hopi in Arizona to pacify Paalölöqangwt (Water Serpents) in order to prevent floods, earthquakes and landslides. Incorrectly sung songs are believed to have caused the fault underlying the village of Shungopavi. If it happens again the fault is expected to open and the community will sink into the ground (Malotki 2002: 15—23).

Some sounds mimic the murmurings of human voices. More than that, sound sequences form patterns in the mind and effect rhythmic movements. Native occupants of Vancouver Island and their relatives on the adjacent mainland include Nuu-chah-nulth residents who believe that earthquakes are caused by mountain dwarfs residing in houses inside of mountains where they entice the unwary "to dance with them around a great wooden drum" (Drucker 1951: 154). It is thought that a Nuu-chah-nulth individual, Yahlua, became an "earthquake man" after kicking a large box drum; thereafter "whenever he walked the earth trembled."

It is tempting to suggest that the effects are similar to other musical sounds in that they help to resolve emotional conflicts. Gelada monkeys, for instance, produce a wide variety of sounds of different pitches that accompany all their social interactions (Richman 1987: 199—223). The monkeys' rhythms and vocalizations are particular to emotional states and foster stable bonds between different individuals; synchronizing and coordinating vocals resolves tension. Jane Goodall (1999: 189) reports excited displays among chimpanzees caused by infrasound in waterfalls.

A variety of aural properties occur in volcanic events that range from discordant noise to pleasing fundamental frequencies (Garcés et al 1998; Garcés 2003). Substrate signals in earthquakes and volcanic tremors produce overtones of whistles and howls, with regular frequency spacing and melodies that change frequencies as a function of time, similar to a flute (Schlindwein et al 1995); several internet sites provide sound wav files of examples (see, for example, actual recordings, USGS 2007, innovative applications in *Kookoon: Inner Earth* http://www.traumton.de/label/releases). Specialized recording devices, however, are necessary to document and transform the signals into audible sounds, due to the low frequencies.

Overall, the sounds might be compared to well-organized symphonies in that they affect responsiveness and aesthetic sensibilities. For example, the sound qualities in totally dark zones of caves absent of visual correlates are not perceived as ground-generated effects – *the sounds are the ground*. An equivalent experience is "seeing with the ears"—a peculiar characteristic element of traditional ritual healing practitioners (Ingold 2000:279)—or "facial vision" experienced by the blind (p. 273), whereby the sense of pressure is on the skin of the face, rather than upon or within the ears. Instead of sound acting as an auditory guidance system to orient vision, it is a phenomenon of experience.

Sounds such as these require listeners to be present in the moment, alert, aware, quiet, observant and restrained. Aural scatters turn attempts to locate the source, even with acute perceptual skills, into exercises of patience and force intuitions to be strong. Intermittent murmurs, like the musings of rambling old people, reinforce respectfulness, caring, cooperation, and being supportive.

Natural sounds are an important reason why humans have been drawn to the underground for millennia. Sound artists and acoustic field researchers are central to understanding the various cultural representations of underground sounds. How, for example, are cultural memories projected into and reflected by geophysical soundscapes? How do individuals' and communities' changing relationships to their past transform the meanings and functions of the sounds? How does the interpretation and articulation of the sounds aid or suppress individual and cultural identity?

Objective sound data is vital to confronting a myriad of

challenges associated with the interpretation and understanding of legal rules and institution of cultures and assessments of the impact of social norms and biases related to the future of the earth's resources. Underground sounds are crucial because they can be used to initiate changes at the ground level, for instance in the long overdue reconsideration of cultural resource management laws and related ethical debates in environmental protection, archaeology, anthropology, and museum practices. Related questions that lack answers include, how does the regard of the earth, based upon sounds natural to the ground, affect indigenous concepts of property and communal resources, relative to land rights disputes between an indigenous group and a national government asserting jurisdiction over the territories claimed by that indigenous group? What are the actual and potential claims by an indigenous group for intellectual property rights to cultural knowledge drawn from earthly sound, and related disputes with governments or commercial interests seeking to make use of that knowledge?

Sound artists and acoustic field researchers are uniquely prepared to confront these and other questions that pertain to the raised concern for the intrinsic value of the earth's resources. If merely sources of enjoyment the earth's resources will continue to be regarded as expendable; appreciated as intrinsically valuable they will be cherished and protected. To appreciate does not necessarily mean to enjoy. Appreciation requires gratitude, humility, reverence, observation, quiet restraint, resourcefulness, respect, patience, cooperation, responsiveness, and sharing—qualities that are taught by listening to the natural underground sounds of the earth.

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Sound Artists and Scientists as Complementary Partners in Inquiry

By Barry Blesser and Linda-Ruth Salter © 2007

1. Introduction: A Personal Perspective

During the last 5 years, we have been studying auditory spatial awareness and how people hear space in a variety of cultures (Blesser and Salter, 2006). This project forced us to reexamine assumptions that we had taken as immutable truths throughout our careers. If nothing else, the project elevated our intellectual humility.

The spectrum of disciplines for exploring sound is anchored by artists at one end and by scientists at the other. Artists are best able to observe phenomena and create predictive hypotheses from their experiences working with natural soundscapes and aural compositions. Scientists are best able to validate, refine, deconstruct, and extend those hypotheses using formal tools and techniques. The artist relies on a holistic view of aural experiences that arise in real life with real people; the scientist engages in a segmented exploration of well-defined phenomena that can be best understood in the laboratory under controlled conditions. The artist is interested in breadth and variety, while the scientist values predictability and repeatability.

All disciplines have strengths and weaknesses. Each discipline has its own structural limitations regarding data validity, research scope, acceptable questions, useful answers, and legitimate paradigms. Structural limitations always prevent a discipline from gaining a complete picture of a phenomenon; these limitations are like filters that allow only some aspects of a phenomenon to be observed. A full characterization is never revealed by any single approach. When the insights of the aural arts and sciences are integrated and reconciled, we understand far more than using either approach by itself.

2. Different Ways of Understanding

The motivation for joint activities among soundscape artists and auditory scientists is far more than an academic exercise: there are tangible rewards for both as they struggle with the limitations of their paradigms while trying to understand similar phenomena.

On the one hand, artists often embrace free-form creativity by conceiving of aural experiences that do not yet exist, searching for novel ways of expressing themselves. Through their aural compositions, intentionally or accidentally, sound artists establish human relationships with their audience. In doing so, aural artists must have an intuitive understanding of cognitive and perceptual psychology.

On the other hand, scientists embrace the power of their formalism and techniques, focusing on the details for discovering and validating insights. Consider the ways in which cognitive scientists relate to auditory perception. They observe brain activity or behavioral reactions when subjects are presented with well-defined sound stimuli in controlled laboratory environments. Such experiments in thousands of research laboratories over the centuries have created a large amount of data about specific aspects of aural phenomenon.

Serving as complementary views, each discipline has much to teach the other. Cognitive scientists can acquire an appreciation for phenomena that only manifest themselves in natural environments. Artistic creations can become an application of scientific phenomena. Ideally, an individual should have both kinds of tools available, whether functioning as an artist, a scientist, or both. Neither artists nor scientists have a complete view of the total phenomenon.

In a similar ways, artists and scientists can inform each other in many other fields. With active collaboration among a large number of disciplines, we increase our understanding. However, this assumes a desire to become comfortable with alternative languages and paradigms for exploring complex questions. Crossing intellectual boundaries requires disciplinary multilingualism. Not only do such skills teach us new ways of looking at the world, they also elevate our appreciation for the limitations of our own discipline. Because modern culture emphasizes narrow specialization, very few artists and scientists speak each other's language. A half-century after C.P. Snow (1959) published his plea for bilingualism between artists and scientists, our culture has become even more a collection of isolated islands of specialization.

3. Folk Science and Formal Science

Folk scientists observe, analyze and learn from experiences, combining insights with observations that arise from paying attention to the events in normal life. The value of folk science is rarely recognized. Consider two examples of successful cross-discipline folk science: a formal scientist using folk knowledge, and a sound artist making contributions to biology and ecology.

Robert Johannes (1981), a marine biologist, studied what Pacific Islanders knew about fish behavior. He commented, "The native fisherman searches with his eyes and ears and he is more in touch with his prey and their surroundings than his modern, mechanized counterpart." According to Johannes, the knowledge gained from native fishermen advanced the state of knowledge of marine science further in sixteen months of fieldwork than in the previous fifteen years using conventional research techniques. Johannes was a formal scientist realizing the power of folk science by incorporating indigenous wisdom. An auditory version of this would be an acoustician or sound artist exploring the ways in which tribal groups intuitively use the natural soundscapes to modify and enhance the aural components of their ceremonies.

David Dunn (1999), a sound artist and composer recorded the sounds of beetles below the bark of a particular species of pine trees in New Mexico. After an extensive review of the scientific literature, he noted the sparseness of bioacoustic studies focusing on the kinds of acoustic phenomena that he discovered as part of his combined artistic and scientific activities (Dunn and Crutchfield, 2006). After having heard Dunn's resulting soundscape composition, several research scientists are evaluating the implications of his discoveries (Cummings, 2007).

4. Final Comments

Becoming broadly educated in a wide range of disciplines has pragmatic value for both artists and scientists. Rigid paradigms limit the range of inventive creativity; researchers come to know more and more about less and less as they repeat minor variations on well-trodden themes. Artists, too, can fall prey to re-exploring familiar ground with minor changes.

At the same time, as advances in technology open up new tools, methods, and possibilities, all of us face another problem: handling exponentially growing choices. How should one choose something worthwhile to study as a scientist, or to implement as an artist? With modern technology, artists can create variations forever without necessarily producing anything of enduring value, and scientists can study questions that

have no consequence to the larger society. Exponentially growing choices creates a burden, and a broader view provides the means for sorting choices. An active collaboration helps both artists and scientists sort their choices. By cultivating more comfort with each others' languages and methods, artists and scientists can both respond to the challenges before them: scientists can dig deeper into experiences that manifest themselves in aspects of real life, and artists can incorporate cognitive psychology and other sciences into their work, thereby enhancing a listener's appreciation of soundscapes and aural compositions and producing sound art that initiates practical changes in the listener's awareness and actions.

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Bringing (Composed) Activism Back Into The Soundscape

By Elsa M. Lankford

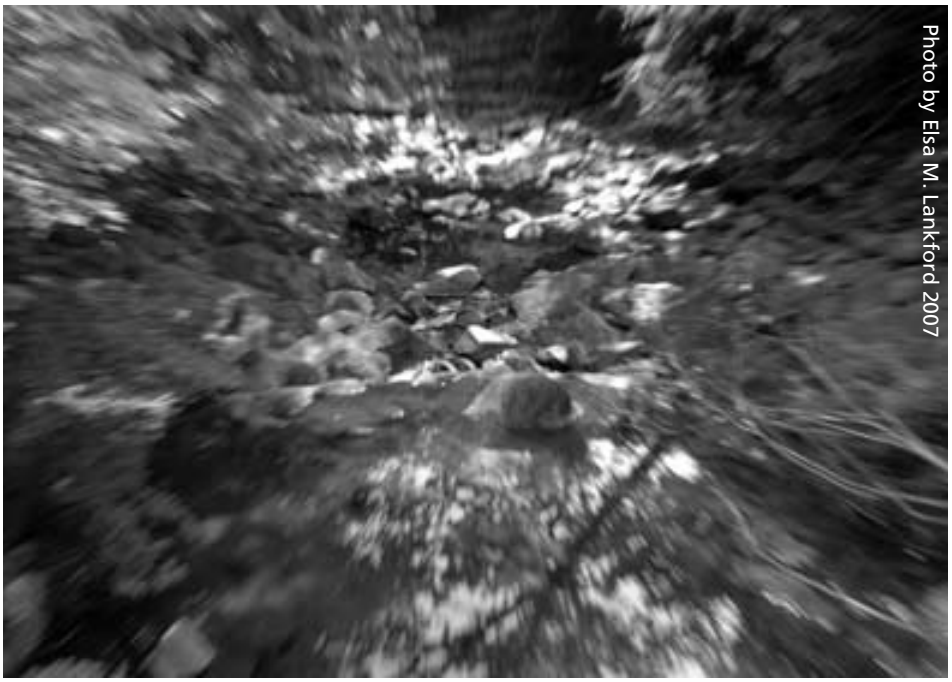
Note: *This article features accompanying sound files, available online. See the note on Page 2 for instructions about accessing this issue's audio supplement.*

Just about every square inch of land has been touched by the hands of humans, and our fingerprints leave marks. Some will largely wash away with time. More are rearrangements of the earth. Many of these rearrangements are permanent and mark the paths of "progress." I sometimes travel on these paths, our highways. Often I do not know their history: what was underneath where I travel – farmland, a neighborhood, a park? When the asphalt or concrete is laid for a highway, we permanently scar the landscape and the soundscape. Amnesia sets in.

For some cities, the inevitable "progress" was stopped. In Baltimore, the East-West Expressway had been in the planning stages for many years, in one form or another. The purpose of this highway was to allow quicker ingress and egress to the Central Business District (CBD), or downtown, as well as to connect Baltimore to I-70, an interstate running all the way to California. It was planned to go through several neighborhoods, some deemed as blighted, some now marked as historic, as well as through Leakin Park, a large thousand-acre urban park in west Baltimore City.

The preferred route design for the East-West Expressway was to divide Leakin Park in two. As the city, the state, and the feds started development, hundreds of houses were torn down to construct part of the highway. Environmentalists and community activists stepped up their fight to stop the destruction and construction. When the bulldozers were finally laid to rest in the 1980s, one section of the East-West Expressway had already been built, totaling a little over one mile, displacing hundreds of families and dividing neighborhoods. Leakin Park, years later, is still very much wilderness with a new and much celebrated multimillion dollar hiking and biking trail, Gwynns Falls Trail, running much the same route as the proposed highway, from the park through adjoining neighborhoods to the Inner Harbor.[1]

This year, in 2007, I created a sound work for "Art on the Trail," a summer environmental art event along part of the Gwynns Falls Trail, entitled *What Is Now and What Could Have Been*. The work was created both as a celebration of past activism in Baltimore City and beyond, but also as a



Dead Run, which meanders through this part of Leakin Park and ends up making its way to the Chesapeake Bay, is an important part of the soundscape of the park. Some of the water sounds for *What is Now* were recorded from this section of the stream.

The only asphalt that runs through Leakin Park is part of the Gwynns Falls Trail. Here, a switchback crosses part of Winans Meadow as the trail heads to the I-70 Park and Ride. The speakers for the installation of *What is Now* were installed across the path from the large tree and picnic table.

wake-up call to all of us. Such activism should not be thought of as a fight against progress, but rather the allowance of true choice in a democracy, including the choice of saying "no." During the creation of this work, and still after, I began to skim the surface of one particular aborted highway[2], and in doing so, found that it was illustrative of many U.S., and some Canadian, cities as well.

Picking up on this year's theme of "A Place in Time," I visited the park and the trail in search of inspiration for a sound work. At first, I tried to think of the equivalency of a sonic frame: a Kodak moment for our ears where people stop and listen and further understand and appreciate what it has taken for them to be able to enjoy this very spot.

What Is Now and What Could Have Been is a soundscape of the current and the one-time possible future; it is both an activist wake-up call to what could have happened (and what theoretically could still happen), and a celebration of the activists that stood up to the bulldozers and won.[3] The composition begins with the existing soundscape, flows into highway sounds, and then back to the current sonic state of the park. In organizing the sounds and in creating the composition, I decided to go with a layered approach to allow each sonic element in the park to be heard.

One issue that concerned me about the work was the introduction of noise or sound pollution into the soundscape. It is not often that we strive to deliberately fool the ear, but it is necessary in creating an imaginary soundscape, whether it be for a film or for a work of sound art. R. Murray Schafer describes the phenomenon as schizophonia, the separation of the sound from the source, resulting in the introduction of non-immediate sounds into our personal soundscape. It seemed to me that the very purpose of this particular installation called for the introduction of some "appropriate schizophonia," in the form of an evocation of the highway that might have been. This choice was somewhat eased by the fact that, as an urban park, the soundscape is not pristine; in addition to the sounds of the water and birds, human movement through walking, bicycling, and cars are audible. Due to the short duration of the highway portion of the piece, less than four minutes per cycle, I decided to keep the amplitude loud enough to be heard over the current sounds of the area, but only directly within a 10 to 20 foot radius. If the highway sounds blended in, then the main purpose of the piece, to call attention to the "ghost" highway, would have been lost. Instead, the blaring horns, sirens, and racing engines cause viewers/listeners to question the source of the sound in the middle of a park, and to consider the reasoning behind it. Although I do want the sounds to make an impact, I did not want to aurally overwhelm the park or its visitors.

Activism is not dead, despite the news headlines regarding more of the same; it is simply not as loud as it should be. As artists who work with sound, we are experts in making things heard. Some problems need more amplification than others to be perceived through the din. Some events and past occurrences need to be brought back to our attention so that we do not allow the same mistakes to occur. Whether we play the role of activist-artist, or we use our media to publicize activists of the past, present, and future, sometimes we all need to be reminded to take off our headphones and start listening.

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The planned expressway through Leakin Park circa 1970. I-70 was to head east elevated through the park until it met up with I-95 near the heart of Baltimore. Instead, it now ends abruptly just after entering the west end of the park. From http://www.roadstothefuture.com/I70_Leakin_Park.html

Footnotes

1 http://www.gwynnsfallstrail.org

2 Because of this project, I have just begun an audio documentary on the activists who stopped the highway as well as the transportation alternatives such as the Gwynns Falls Trail and the Red Line mass transit line, which is still in the planning phase.

3 Please check my website http://www.elsalankford.com for credit for the sound artists whose recordings were incorporated along with my own into *What is Now and What Could Have Been*

Sunset

Reclaiming Declassified Military Wilderness: linking the art and science of sound for rainforest conservation.

By Jay Needham and Andrew D. Carver

Note: *This article features accompanying sound files, available online. See the note on Page 2 for instructions about accessing this issue's audio supplement.*

The tropical rainforests of the Americas are experiencing deforestation and uncontrolled urbanization at an unprecedented rate. The resulting loss of wildlife species and their fragile habitats continues to irreversibly alter soundscapes that have helped shape the region's culture and human-environmental interactions. The goal of this article is to define an innovative partnership between a sound artist, scientist and environmental activist aimed at the common goal of conserving the natural and cultural heritage of Panama, one of the most biologically diverse countries in the world.

The foundation of our improbable collaboration began with an all too common approach to environmental activism—separation of art and science. As a sound artist, I have been creating a series of artworks that interweave themes relating to borders, and issues concerning natural spaces that are currently or were formerly occupied by military forces. These are protected landscapes and signal-scapes of a different order, chosen initially for their benefits to defend and promote American interests, often times once secret, well guarded and fortified. In the case of "Listening at the Border," that radiophonic work focused on the story of an American sound spy whose duty was to listen and translate coded voice traffic from inside North Korea. "Narrative Half-Life" is an ongoing series of sound and visual works that trace my familial and military ties to the origins of the atomic bomb and to Hanford, Washington, a 500-square-mile Department of Energy site and home to the first full scale atomic reactor.

Simultaneously, ecologist and land use planner Andrew Carver was studying wildlife populations in Panama and supporting a local grass-roots environmental organization's efforts to transform a one thousand-acre tract of abandoned U.S. Department of Defense land along the Panama Canal into an ecological reserve. The Association Panamericana para la Concervacion (APPC), led by environmental activist Nestor Correa, has fought hard for government approval to set aside this tract of land as a public rainforest park. Known now as EcoParque Panama, the land had been kept off-limits since 1911 as an ammunition bunker complex for the former Rodman Naval Base. In 2000, the canal and surrounding lands including the naval base were reverted to Panamanian ownership. Its 20 kilometers of roads and sixty concrete bunkers all resided inside a fenced compound characterized by rolling hills and tree canopies reaching 35 meters. The landscape is unique in that it contains thousands of plant species and hundreds of birds and mammal species even though it is adjacent to the sprawling urbanization of Panama City. Endangered wildlife species inhabiting the site include jaguars, anteaters and titi monkeys. The space and its politics are unique culturally because of the inherited and somewhat hermetic outcome that resulted in the creation of a now rare and valued landscape.

In January of 2007, I was invited to Panama by Carver and Correa to record the sounds of EcoParque Panama. Upon arrival in Panama, my initial meetings with the APPC staff centered on defining the several kinds of collaborations that could take place between us. Rather than making art alongside or as a visiting artist with this

Boundary of EcoParque as it abuts a newly constructed golf course community.

Jay Needham recording in a bamboo grove – EcoParque Panama.

organization, I sought a different relationship; a longer and more lasting one that may assist in promoting change outside artworks I may author. Our discussions revealed that we shared many common goals regarding conservation, education and a grass-roots approach to the environment. Our focus quickly narrowed as we outlined how our backgrounds and our interests might be complementary. The APPC was interested in both the scientific and creative aspects of sound. From the scientific standpoint, the dense tropical vegetation had been hampering the visual-based scientific study of the area's wildlife. From the creative standpoint, the unique sounds of the Park had the potential to improve the experience of future visitors (on site) as well as increase the general public's environmental awareness (off site).

Field recording began in March 2007 with the general goal of cataloging both the natural and human sounds within EcoParque Panama during the dry season. Panama's dry season is a "winter" period of five or six months where little rain and North East winds dominate an otherwise intensely humid tropical climate. Mornings, afternoons and evenings were spent recording at various locations inside the Park, concentrating on recording near the existing network of asphalt roads, as they will eventually be used as paths for visitors and researchers.

The distribution of city sounds as they migrate into the Eco Park landscape form many amazingly dense soundscapes.

Explosions from the current expansion of the Panama Canal mingle with the cries of titi monkeys, toucans, barge traffic and airplanes. Sprinkler heads from newly planted golf courses can be heard as one views a sloth in the "wilds" of the Park. The stories these sounds help to tell is one of a land and fauna in rapid transition, a Panama City in the early stages of a hectic globally funded re-build.

While in Panama I learned that far too much research conducted in Panama, whether scientific or creative, was being "exported" without contributing to Panama's sustainable development, academic and community/cultural trusts. The exploitation of rainforest plants, animals, and indigenous medicinal knowledge for global pharmaceutical use is a frequently cited example. Our discussions to create a plural and reciprocal path for research originated from our interest in how successful collaboration occurs and what sustains it.

Our use of the gathered sound files will be beneficial for on-the-ground activism and as a method for raising awareness globally. This includes production of the bilingual CD titled *Dry Season: Edition 1* in late 2007 (in press), a listener's guide to this former military landscape. Also, the development of *The Vanishing Sounds Project*, a grass-roots effort to teach Acoustic Ecology in Panama to Panamanians. Our structure for this program is designed to extend into the community, to blur the lines between the academy and the community and to foster regional research and creative production. Our initial goal is to develop a series of weekend workshops that focus on the political,

Andrew Carver walks a road inside the EcoParque.

Online WFAE Newsletter:

http://www.wfae.net/newsletter.html

This is a bi-monthly supplement to *Soundscape—The Journal of Acoustic Ecology***.** Our goal is to make available, in a timely manner, news, events, and announcements from WFAE Affiliates and other sources. Newsletter contributors are asked to send related news and information to the WFAE secretary (secretary@wfae.net). We welcome information about regional events, new publications, and general news of interest to the acoustic-ecology community

environmental and aesthetic aspects of the discipline in order to promote a regional approach to listening, gathering, creating and critiquing sound. This platform will also serve to launch additional teaching opportunities in the media arts including micro-FM and video journalism with an emphasis on developing a hybrid space of practice among researchers, artists and members of the community. EcoParque Panama will serve as a compelling field classroom not only because of its rich combination of wildlife and city sounds but for what is underscored pedagogically by encountering nature in a reclaimed landscape.

If park sites can be viewed as a kind of species or social organism, EcoParque Panama itself represents something of an indicator. The designs for the interpretation of this post-colonial landscape are being drawn by scientists, artists and environmental activists who are interested in the layers of nature and culture present in the assigned boundaries of EcoParque. As classified spaces become increasingly public, a bit of reversal of fortune is now at play. The designers of the military bases along the Panama Canal could not have imagined that roads paved for trucks to carry bombs would one day be used for sound-walks or the preservation of endangered wildlife. Because of its prior off-limits status to hunters, poachers and the public alike, what was preserved by accident will soon offer Panamanians and others opportunities to learn forms of ecology, conservation and the arts in an area of the world where development is at the door and knocking loudly.

Online Sound Files

- Bamboo Grove
- Noon with Jet

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Above the canopy East of EcoParque Panama.

The Greek Soundscape Research Group and the Corfu Project

By Andreas Mniestris and Ioanna Etmektsoglou

For the Greek Soundscape Research Group[i] Corfu, July 2007

The necessity to study the sound of the environment in Greece combined with the opportunity of a research grant[ii] gave birth to the first Greek Soundscape Research Group in 2005. This has been the result of an initiative of the Electroacoustic Music Research Lab of the Ionian University, Music Department at Corfu, and the enthusiastic collaboration of Ecologists, Acousticians, Recording Engineers, and Sound Artists from all over Greece[iii].

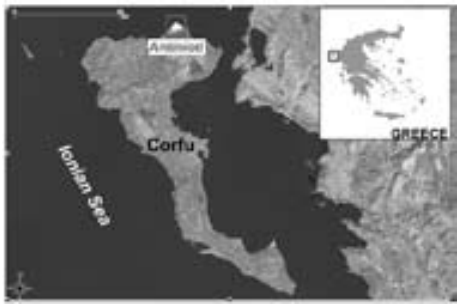
The ecologists of our group outlined this project based on the idea of researching how landscape diversity affects its correspondent soundscape. The area of Antinioti sea-lake at North Corfu has been selected for this study because it presents a high diversity of land cover and land use types including wetland systems, coastal systems, primary forests, cultivation fields, meadows, olive plantations and semi-urban areas spread across the study area. The acoustic environment of the site combines sounds produced by different human activities (tourism, agriculture, construction and transportation) and natural sounds defined either as biological (i.e. wildlife organisms or domestic animals) or geophysical sounds (i.e. waves, rain and wind).

The main objective of this projects has been to study the spatiotemporal variation of soundscape in relation—spatially—to the different sites within this area and—temporally—to the daily and yearly time cycles. We wanted to collect various data, both objective (sound recordings and multiband sound pressure levels) and subjective (estimation of sound origin based on the anthropophony / biophony / geophony classification scheme and estimation of the contribution to the soundscape of each of its individual constituents based on a classification as background or foreground and on a categorization according to perceived intensity). To realize the data collection, groups of four specialists were formed, each including a recording engineer, an acoustician and two trained observers for the subjective estimations. All data were to be collected synchronously at certain fixed locations in the area. Fifteen such locations (sampling points) were designated in equal distance of 350 meters from each other, systematically spaced across the study area. Field recordings and data collection were carried out in March, June, September, and December of 2006, covering the seasonal variation of the soundscape. During each sampling season, data were collected at each sampling point in 8 successive time periods (once every three hours) covering the daily variation. Within each time period, a 10-minute data sampling was carried out which was further divided into forty sequential time-steps (of 15 seconds), generating time series data.

A significant amount of data has been collected through this procedure, which are being examined by various teams within our group. One of them, under the supervision of J.D. Pantis and G. Matsinos, studies in detail the influence of habitat and topographic characteristics on the acoustic experience, making extensive use of soundscape thematic maps (for example, one map shows sound origins represented in a composite RGB color map, where Red represents anthropogenic sounds, Green biological, Blue geophysical ones and intermediate colors describe combinations of the different sound categories). This visualization method of sound diffusion in relation to the landscape characteristics can be used to explain patterns of sound origin, to analyze soundscape variations on a spatial basis and to identify the factors that affect the development of the acoustic environment. Other teams or individuals work in different directions. For example C. Stratoudakis and K. Papadimitriou[iv] have used a combination of geographical data and sound recordings to create an interactive interface for the reconstruction of the soundscape. Another example is the work of A. Loufopoulos, an electroacoustic music composer, who has used the recorded sound as primary compositional material for his recent compositions.[v]

At the end of 2006 the Greek Soundscape Research Group completed the first phase of fieldwork and entered the phase of analysis and evaluation of the collected data. The results of this project (research papers, music compositions, sound installations, educational applications etc.) will be presented at the first Greek conference on Acoustic Ecology, scheduled for November 30 and December 1, 2007 in Corfu.

We hope that this work will serve as a good departure point for soundscape research in Greece. Moreover, we hope it will give us the opportunity to start a fruitful communication and collaboration with the international community of sound environment researchers.



Footnotes

i Apart from those mentioned already in the text the following have participated in this project: D. Batjakis, G. Chatziyannidis, J. Chouvardas, E. Drakou, G. Fragkiskos, Th. Lotis, N. Kefaloyannis, H. Koutsodimakis, A. Mazaris, D. Mayoglou, Ph. Theoharidis, J. Tzanopoulos, C. Tzedaki, N. Valsamakis

ii Part of the Pythagoras II action of the Operational Program for the Education and the Initial Professional Training drawn by the Greek Ministry of Education.

iii Aristotle University of Thessaloniki, School of Biology, Department of Ecology and Aegean University, Department of Environment at Mytilene; Technical University of Crete, Department of Acoustics and Music Technology at Rethymno; University of Patras, Department of Electronic Engineering, Audio Group; Acouson Ltd, Athens.

iv C. Stratoudakis, K. Papadimitriou, A dynamic interface for the audio-visual reconstruction of soundscape, based on the mapping of its properties, *"Proceedings of the 4th Sound and Music Computing Conference (SMC07)", 11–13 July 2007, Lefkada, Greece*, pp. 185—191, or http://smc07.uoa.gr/SMC07%20Proceedings/SMC07%20Paper%2029.pdf

v http://smc07.uoa.gr/SMC07%20Program/Extended ProgramV5final_corrected_2.pdf, p.11 and p.45

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What is a River?

By Annea Lockwood

Note: *This article features accompanying sound files, available online. See the note on Page 2 for instructions about accessing this issue's audio supplement.*

Between 2001 and 2004 I made field recordings at 80 sites along the Danube from its sources in the Schwarzwald to the delta at the Black Sea, traveling with my partner, Ruth Anderson. From these I shaped an installation, *A Sound Map of the Danube*, an aural tracing of it, interleaved with the memories and reflections of people living on the river (in their native languages), forming a parallel flow of languages and of relationship with the river. These form a surround-sound work almost three hours long, in 5.1 format but with the loudspeakers arranged in an equidistant circle. A large wall map, made for the project by cartographer Baker Vail and graphic designer Susan Huyser, shows the sites recorded, the time of day and date of the recording (indicating seasonal changes), and the time within the duration of the work at which each site can be heard. Beside the map is a running-time display made by Roland Babl. The sound files are looped and the time display is retriggered to 0:00 by a short signal at the start. The final mix was done at Harvestworks, NY, with Paul Geluso.

I recorded at the surface and underwater, capturing a wide array of water, human, and other sounds from the river environment. Mixed into these are the voices of people I talked with: fishermen, artists, a river pilot, a shipping agent, a delta guide, and others. A booklet of these interviews, translated into English, is placed near the map and stones collected from the riverbed all along the river are arranged beneath the map; handling them gives people direct tactile contact with the river's geological nature. "What is a river?" was the question driving the whole project for me—I felt I had barely scratched the surface of that question back in 1981 when I worked on my *Sound Map of the Hudson River*.

The (Danube) Sound Map's structure was easily established: Hoping to convey something of the way the river unfolds downstream, I both recorded and mixed the sites to flow in that direction; the way a listener hears it is the way I experienced it myself. Each site is presented alone, so that its details are distinct. The longest site duration is 6:19 and the shortest is 1:10, set subjectively by how long I think it may take a listener to move beyond identification, inside the soundscape. Transitions are sometimes extended crossfades, sometimes abrupt, depending on the material and the ongoing pacing and rhythm of the whole.

Annea Lockwood recording at Géderlak, Hungary

Planning for the 5.1 format, several times I recorded different aspects of a site, then placed each in a different speaker, for example: In Passau, Germany, I recorded the Inn River, the cathedral carillon (the deepest bell in Germany), and Rainer Moschak (schoolteacher) remembering "we could also smell the Danube from our windows. That river stank! I remember that so intensely!" but also the freedom, which the annual floods brought—no school. Underwater is often less turbulent than the surface and with this format I could present both layers at once, as in the delta, where I placed wind in the immense reed beds on two speakers, the gentle gurgles from small underwater springs at the same location on two other speakers, and through the fifth speaker, the voice of Nicolau Vergos, a marine engineer and delta guide from Tulcea, Romania, describing navigation in the delta:

> There are many smaller, shallow channels in the delta, where, when you are trying to get to a certain place by way of these channels, you have the chance of finding some floating islands. These are made of reeds, bulrushes, whose roots are tangled, even of soil. They are called 'laurels'. From time to time these channels can be closed by these laurels, and you may find yourself blocked. I will give you an example. Say you need to navigate on the Magearu channel in order to get to Letea, a very beautiful but remote area. And after five hours, let's say, you find yourself unable to get any further. What can you do? You can try to push through [the laurels] if you have a stronger boat; or you can wait for someone else to come, so that you can push together; or you can go back, if there's nothing else to be done. . . . Or you can sleep there for a week!
>
> Speaking of laurels, they are very interesting, because you can go fishing on a lake one day, and see around you the shore, the reeds, a small hill–the place where you're catching fish, but when you return next day you don't recognize the place. The place where you went fishing was a floating island, which had changed its position, due to the wind, and now you can't recognize it any more.
>
> Yes, that's it, you can still feel [the delta is] wild. The delta means freedom for me. You can still go there with a backpack and stay for a month without spending a penny. Not that it is about money, but this gives you a feeling of freedom and happiness-that you don't need anything, and you can live from God, fending for yourself. A few days ago, I saw on the television how the army tries to survive in the delta. They take survival courses, eat frogs, fish, and what they find there. But the delta is a paradise; you can stay there and do nothing. All this comes from God. They should try to survive in the mountains, eating tree bark! (translated by Anamaria Ignisca)

Each layer remains distinct, as it never could in a stereo mix. In this way I hope to draw a listener into the middle of a rich soundscape in "an attempt to get the river flowing through the ears into the brain, the body, the whole physical system. Sound's great strength is its directness; it tends to slip beneath concepts, behind thoughts. This way you can take the river inside you." (Notes from a journal I kept during this project.) The delta was the quietest place I have ever recorded—cars are excluded from the delta, but also no planes or even other boat motors, were audible. For once the combustion engine was absent.

The people I spoke with along the river came to seem as deeply a part of the river's being as the geese and herons, the frogs, aquatic beetles, carp, alder and willows. So whereas in *A Sound Map of the Hudson* I presented personal river stories as a physically separate component (through headphones), here the voices are integrated into the mix, placed with the site closest to where they live whenever possible. I am interested in how and why people are drawn to rivers so strongly, myself included. Certainly rivers are iconic to us, suggesting continuity and voyaging, infinity perhaps; they provide livelihood, but even more, they seem to be an integral part of personal identity for those who live on them. "For me, it's a whole—it's a real part of my life—not to live on the Danube would be a catastrophe. I couldn't function", Michael Fröschl, a cabinetmaker and boatman from Grein, Austria, told me. And for Ivailo Porojanov "...the river is my life. I've been to other places where there is no river. I feel like a half person. I have no freedom there. The river means freedom to me". So in this installation the voices of river people, speaking in their native languages, are merged with the river's sounds, responding to the questions I asked each person I interviewed: "What does the river mean to you? Could you live without it?"

I found people in a variety of ways: Lambert Spadinger, a window manufacturer, over a beer in a pub in Donaueschingen; a Bulgarian poet from Ruse, Vania Hinkova, in her bookshop where I'd gone hunting Bulgarian folk music; Gizela Beba Ivkovic from Novi Sad, Serbia through a helpful hotel concierge who became interested in the project—in fact everyone we met, Danubians all, thought the project self-evidently reasonable! People were happy to talk about something so central to their lives. One evening in Tutrakan, Bulgaria while I was sitting by the river after recording, a young fisherman passed us, and greeted me in English. I blinked, then ran after him and snared Ivailo Porojanov for an interview the following morning. Language was not a problem. I found I could use either English or my basic German and needed a translator only with Gizela Ivkovic, whose husband turned out to be an English professor, and she herself a choral conductor. The Ivkovics gave me a wonderful experience of generosity. It was the day of their wedding anniversary and Gizela had been baking a great array of delicious cakes, cookies etc. for a family celebration that evening. In the midst of all their preparations, without even mentioning the anniversary, they cut a slice from a fresh-baked cake, packed cookies and quinces from their garden into a bag for me, and gave a long, leisurely interview.

Gizela was my most nervous interviewee until the talk finally turned to how often the river has been a site of human conflict, and sorrows; she recalled family separation during WW 11, then continued, with passionate fluency:

> During the [recent] war we were often bombarded [1999 by NATO]. We were in a state of shock the whole time, regardless of the bombing. The bridges near which we grew-up were a part of us. It was miserable to watch those pictures and it was painful to look at the Danube after the bombings because it looked like a decapitated man. We were not only frightened but also disappointed with what was happening. One of my friends who was a doctor at the time and worked at Petrovaradin had to go to work every day...and even though there were sirens and there was a chance that he would lose his life, he went anyway. Those days were frightening and unforgettable. He was telling me that at that time they had no—I mean neither did we—electricity or water. They had to do operations using battery-operated lamps and using barrels filled with water. Those are thing that can never be forgotten.

These were the bridges of Novi Sad, and even after the new Rainbow Bridge had been completed, four years later when I went to record by one of the destroyed bridges on a Sunday morning I saw people walking slowly out onto a surviving span, silent, alone. This is a river that has shaped human history strongly, and the evidence is everywhere, from the styles of coffee drinking, and boat building, to old levees, Roman garrisons' walls and the deep ruts of disused fords.

I started working on the Hudson River back in 1981, in part with the idea of bringing to full sensory life a river, which, in NYC, is easily reduced to food for the eyes alone, a vista—for the inhabitants of the huge glass monoliths going up along the West Side Highway, for instance. But water consciousness is increasing, I am happy to see, and by immersing listeners in the being of rivers through their sounds, I hope to trigger that love of moving water which we all seem to feel, and a desire to cherish the rivers which nourish us.

After working on it for four years, my strong feeling is that the Danube is alive, shaped by gradient, soil and rock conditions, climate, and animal as well as human action, but as powerfully, the river is a shaper of the land around it and of the human societies along its banks. Way down in Russolo, Bulgaria, towards the end of the final field recording trip, we found a mud bank hollowed into an almost complete tube—producing marvelously resonant sounds—and I suddenly realized that the river has agency; it shapes its sounds itself by the way it sculpts its banks. It composes itself. Listening to it I feel that I'm hearing the process of geological change in real-time, which is enthralling.

Editor's note: *Lovely Music <http://www.lovely.com> will issue a recording of the complete Sound Map in 2008, and it can be heard at Schloss Orth, the museum of the National Park Donau-Auen, in Orth an der Donau, Austria from March to November, 2008.*

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Generative Schizotopia: SameSameButDifferent v02 – Iceland

By Thor Magnusson

The *SameSameButDifferent* (SSBD) project is an ongoing study of the production, distribution and reception of generative music. Version 2 comes in the form of software that generates soundscapes of Icelandic nature. The software is released on a CD and people can run the system on their own computers and generate endless versions of soundscape compositions. The authors have spent years recording sounds in the Icelandic nature and these recordings are the sources for the soundscapes that the software generates.

SSBD is a phonographic project. Phonography can be defined as the sonic equivalent to photography, i.e. a methodology where the phonographer "frames" the sonic environment by carefully choosing the location and time with special attention to what he or she wants to record. With a strong emphasis on the process of the recording, the focus is on place (with its historical and geographical signification) and the time in which it is recorded. Everything that vibrates is of utter importance: if there are people in the environment, animals, natural sounds, machines, or parasensory sounds such as electromagnetic waves, ultrasound or infrasound, etc. Not only is the time-space aspect important but also which equipment is used (mono, stereo, binaural, 3D field microphones, analog or digital recording devices and the bit resolution and sample rate used in the recording) and where it is placed (zooming in to the sound source or backing off to get an overall scope of the sound field).

The sound sources of *SSBD v.02 – Iceland* are field recordings of Icelandic nature (geysers, hot springs, rivers, springs, ocean, wind, fire, birds, foxes, sheep, snow, ice, glaciers, rocks, etc.). In choosing the recordings we deliberately excluded human noises, which was relatively easy as there was hardly any human noise in the remote places where the sounds were recorded. Our aim was to represent the natural soundscapes of the country in as many ways and combinations as possible and for that purpose the generative music format is ideal. The recordings serve as raw locations but in each performance of *SSBD* we get a unique fictional place, which could or could not possibly exist. The listener is situated in these locations with a binaural head that could or could not possibly exist, as the zooming into particular sounds and their subtle processing can be disproportionate to other sound origins. Not only is the head dispersed in space, but also the sound sources themselves change locations gradually, creating the illusion of a levitation and movement inside the soundscape.

The focus is on location, presence, temporality and the subjective dislocation in space that we have termed here "schizotopia"; namely, the fact that we are faced with infinite locations and infinite ways of virtually placing our ears within that space. We find this creative dislocation of time, place and ears interesting and ear opening. It is as if the frames of the recordings converge into a multidimensional space where our physical laws do not exist. The experience becomes closer to the logic of dreams.

This project was initiated concurrently with a political situation in Iceland where the government was relentlessly trying to change our relationship with nature from one of dependence, awe and respect to a utilitarian relationship where we look at nature primarily as standing reserve for energy. This has resulted in the drowning of vast natural landscapes, wilderness full of canyons, geysers, unique birdlife and untouched lands. As multinational corporations are building dams, hydroelectric power plants and aluminum smelters in this small country of cheap electricity and manpower, the government is doing its best to raise the country's emissions of carbon dioxide to the fullest capacity according to the Kyoto contract. Tragically, protests started too late this time but these events have resulted in an epochal change in the population's relationship with the nature and the way it is appreciated.

Our aim with this version of *SSBD* was to point to the sonic beauty of our environment and use its infinite resources of natural rhythms and harmonies as source for a work where the generative power of the computer combines new soundscapes and locations of infinite possibilities, albeit designed by the authors with finely tuned aesthetic details.

THOR MAGNUSSON is an Icelandic writer, musician and artist/programmer who writes his own musical software. After having studied music, philosophy and cultural studies in various places in Europe, he graduated in Electronic Arts from the Lansdown Centre for Electronic Arts in London. Since then he has been working in sound-related programming in various projects, one of them being the ixi software project where he, Enrike Hurtado and few others are experimenting with creating alternative interfaces for musical composition. **thor@ixi-audio.net**

Antarctica: Musical Images from the Frozen Continent

Craig Vear, 2005

Reviewed by Jim Cummings

Composer Craig Vear traveled to Antarctica in 2003, as part of a British Antarctic Survey program that allows artists to travel along with scientific expeditions to the continent at the bottom of the world. These programs (similar opportunities are available in other countries) are great opportunities for sound artists, writers, and photographers to engage in a "mobile artist retreat" of sorts; previously, Doug Quin created several programs for the Westdeutscher Rundfunk in Cologne, Germany and a CD based on his experiences in Antarctica.

Vear has produced a truly exceptional publication, consisting of a CD, a DVD, and a book of photos, journal notes, and the recollections of others who have traveled to "the Frozen Continent." While the sound pieces, videos, and writings do not address climate change or the melting of Antarctica, it is hard to view or listen to the results without being aware of the changes taking place in this vulnerable landscape. The omission of explicit reference to the melting is likely a reflection of both the obviousness of the point, and of the artist's experiences there, which, judging by his journal, kept him firmly in the present moment, ranging from weeks of boat-bound tedium to bursts of amazed wonder once ashore.

Vear offers listeners a wealth of creative responses to this place. The centerpiece of the package is a 26-minute composition, titled simply "Antarctica." The piece weaves sonic elements gathered on the journey, including the sounds of travel, wind, and animals, along with the voices of four different people reflecting on their times in Antarctica. The voices, presented in several "vocal quartet" sections, are sometimes distinct, sometimes layered, sometimes distant emanations of the land itself, and offer rhythmic and melodic elements that are central to the piece, as well as a grounding place amidst the utterly baffling sounds of many of the animals whose voices become part of the mix. Adding to the sense of exploration and discovery that permeate the piece are the three choices presented on the DVD to accompany the composition: a slide show of photographs from the trip (which bear no obvious relation to the unfolding soundscape), a slowly changing wash of colors, or no visuals at all. The piece is presented in both stereo and 5.1 versions, and a "director's commentary" offers Vear's annotations about the sounds used in the composition, and his compositional process.

The DVD also offers five shorter pieces, which he calls Antarctic Solitudes. These feature archival video, often slowed down, and generally fascinating, with soundtracks that are more electroacoustic and abstract, also composed largely from recordings made on the trip. In addition, Vear presents an earlier audio work, *The History of Icelandic Music*, that uses similar compositional techniques (the blending of found sound and human voices) to those used for *Antarctica*. Finally, the DVD includes an eight-minute video journal that gives a taste of Vear's travels, by boat, plane, and foot.

The audio CD features extended tracks of source recordings that are in some ways the most compelling part of the package. These rich soundscapes are beautiful, very strange, and quite immersive. Vear carries our ears perhaps even further out than Quin did on the *Antarctica* CD he produced for Wild Sanctuary, which is no mean feat. Penguin and seal colonies create a holy racket that is very different than the animal choruses we are used to in temperate zones, while three extended water-oriented tracks create their own immersions in soundscapes most of us will never hear, and likely never imagine. The colony recordings seem to set us amidst uproarious activity, while the water pieces are all about motion in and through water and ice.

The book that accompanies the discs (one of which slides into each cover) is just a bit larger than a normal CD booklet, and at 88 pages, is a substantial document in its own right. Photos bring the trip alive visually, while Vear's journals provide a sense of the long days of travel (his expedition sailed a huge triangle to islands off the southern Argentinean coast before heading south to Antarctica), the mind-boggling expanses of rock, ice, and penguins, and a magical few days on his own in a remote hut built by early British surveyors. Several pages are devoted to transcriptions of the five recorded recollections used in the piece, presented in parallel to each other on the page, as they are similarly presented in the composition.

The three elements of this publication are wonderfully complementary, each informing the others in new ways as the listener explores them repeatedly over time, with very little repetition or overlap between the book, CD, and DVD. It all adds up to an extremely coherent artistic presentation, and is most highly recommended.

The Antarctica book/DVD/CD can be purchased from: http://www.antarcticconnection.com/AB1583000equick/shopexd.asp?id=2143 in NTSC format. PAL format is available from Vear at vear@ev2.co.uk.

One Square Inch: Hoh Rain Forest, Olympic National Park, April 28, 1996

Gordon Hempton, 2005

Reviewed by Jim Cummings

Gordon Hempton has long been one of the most widely heard voices speaking up for the loss of "natural quiet" with the expansion of human noise into virtually the entire landscape. Since being featured in an Emmy-winning (an American award for TV productions) show about his quest to follow, listen to, and record the dawn chorus across America, and ultimately around the world, he's been heard on TV and in major magazines with some regularity. Over the past several years, this media attention has highlighted his One Square Inch project, which stands as a great example of using soundscape compositions to both raise awareness and change behavior on the ground.

One Square Inch was born of Hempton's frustration at hearing the soundscapes of American National Parks becoming more and more dominated by the sounds of commercial aircraft, motorized trail maintenance, and the technology brought in by visitors. After pushing park managers to protect large tracts of land from such noise (this pre-dated the National Park Service Soundscape Program, which is now making some good strides, so far mainly with soundscape data collection), Hempton came up with a simple and catchy idea: to call for absolute protection of a single square inch in each park. From this core, hundreds of square miles might be kept significantly less impacted by human noise. He began close to home, in his beloved Olympic National Park, and, with the blessing of Park managers, chose a location that was as sonically pristine as possible. This is the One Square Inch of Silence, and a recent CD release shares its voice with the rest of us, recorded just as it happened, one evening in spring.

It is, of course, not silent. Just a humble forest soundscape, gentle, and free of human-generated sound. While many in the acoustic ecology community have a healthy appreciation for the richness of human and urban soundscapes, few will doubt that there is a deep need for experiences that take us outside the bubble of human sound, and into areas where we can experience the "hi-fi" soundscapes of wild nature. One Square Inch gives artistic expression to this impulse, this biological need to leave the human world behind.

As always, Hempton's artistic approach to recording is deceptively simple. He eschews layering and studio-created stereo imaging, preferring to follow his ears in the field, and place (or at times move) his binaural head mics so as to create the pans and stereo images he desires. The One Square Inch CD offers a close listen at a single location; rather than seek a recording location that offers an especially unusual mix of sounds or opportunities to explore and discover unique vantage points, here we are invited into a spot that simply is what it is. In this way, it bridges the gap between nature sound recording's tendency to present unusually interesting locations, and a more l'objet sonore approach that finds interest in any and all sounds encountered. In many ways, the listening experience becomes a deepening reflection on place, solitude, and the woods themselves. A gentle rain, a few birds, leaf-drips, occasional flies, frogs at times… nothing special, yet, knowing that this place is one of the last places that is generally free of humanity's sonic presence, we sense the ways that a single airplane would profoundly change the experience, and somehow the place. For those who may be also interested in a wider sonic scope, Hempton has released a fundraising disc featuring sounds from the four seasons at Olympic Park, available on a CD or as a download from iTunes; he also previously released a four-disc set of Olympic recordings, available from his site.

While the staff at Olympic National Park is not making any specific management decisions based on the presence of Hempton's One Square Inch, he has taken pro-active steps to protect the soundscape here. When sound intrusions are noted at the location, Hempton contacts those responsible, often airlines, and includes an excerpt of the One Square Inch recording, along with a sample of the type of noise intrusion that occurred. Through such efforts,

Hempton has secured agreements from Hawaiian and American Airlines to avoid flying over the Park (neither had scheduled flights over the Park, but both had previously flown over during maintenance flights). Alaska Airlines has also agreed to avoid the Park on maintenance flights, but continues to use some scheduled routes that affect other areas of the Park.

The One Square Inch of Silence was dedicated on Earth Day 2005, and sits a bit off a hiking trail, three miles from the visitor's center at Olympic National Park. It is marked by a small red stone atop a moss-covered log, and nearby rests a jar in which visitors have left notes in response to their listening experiences. Thus the One Square Inch is both helping to attune individuals to the value of a rather "ordinary" natural soundscape, and also is changing the behavior of companies whose actions can affect the experiences of thousands of park visitors. This is an example of soundscape activism that sets a high bar, using techniques that could be quite easily replicated in other locations. Further, such projects can only encourage Park managers and visitors to value the relatively pristine soundscapes that do remain, while also building a constituency for management practices that take acoustic impacts into account.

For more information on One Square Inch, see http://www.OneSquareInch.org; to order CDs or digital downloads, visit http://www.soundtracker.com.

Acoustic Ecology Gains Ground in Alberta: *The 2007 Spring Noise Conference*

By Marcia Jenneth Epstein, Ph.D., epstein@ucalgary.ca

Acoustic Ecology was a prominent aspect of the 2007 Spring Noise Conference sponsored by the Alberta Energy and Utilities board (EUB) and the Alberta Acoustical Society, held May 22–25 in Banff, Alberta, Canada. The biennial conference is usually focused on new developments in technology in the noise control industry for an audience composed primarily of acoustic engineers and energy industry contractors. This year a new focus was added: the importance of taking a holistic approach to the definition and control of noise.

Alberta's noise control industry interacts with the energy sector, monitoring oil-drilling sites, compressor stations for coal bed methane plants, and other industrial sources of noise and vibration. The EUB, which mediates between the energy industries and citizens complaining about noise pollution, has an ongoing interest in the development of improved strategies for noise control as well as in the broader mandate of balancing issues of public health with industrial growth in the province. As a result, the Spring Noise Conference planning committee now includes participation from the small but active Acoustic Ecology community in Calgary, an unusual opportunity for us to introduce issues of soundscape recognition and protection to government and industry representatives.

Hildegard Westerkamp and Jim Cummings were invited to the conference as plenary speakers. Their presentations introduced challenges faced by the industry, ranging from the individual (the importance of attention to listening skills) to the regional (the place of human acoustic activity in natural environments). Westerkamp's "Noise Control, Acoustic Ecology and the Practice of Listening" took the audience through several examples of conscious listening and soundscape recording, focusing attention on the possibilities of a future in which attention to sound is normalized in the contexts of health care, law, media, urban planning and ordinary citizenship. Cummings' "Listening to the Landscape" emphasized the gradual changes in traditional rural soundscapes as contributing to today's increasing resistance to industry noise, focusing especially the changing relationship to motor noise, from farm-based utilitarian toward today's networks of traffic, including energy-related traffic, unrelated to the life of local ranches. Among his recommendations was the establishment of larger acoustic buffers for residents, livestock, and wildlife.

Both plenary presentations were well received, as were conference papers about noise control in social, educational and environmental (rather than exclusively industrial) contexts. The newly-established Gene Bolstad Prize for student papers submitted to the conference was won by two engineering students dealing with unconventional topics: Stephanie Lapka on the effects of wind turbine noise on bats, and Jessie Tierle on the challenges of attracting students to acoustic engineering.

The next Spring Noise Conference will be held in Banff in May 2009. Information about the conference, the Call for Papers, and the Bolstad prize will be made available on the WFAE website in the Spring of 2008.

NEW BOOK OF NOTE – Autumn Leaves: Sound & the Environment in Artistic Practice

Edited by Angus Carlyle, 2007, Available at crisap.org
The Gruenrekorder label is hosting on online "Autumn Leaves" audio compilation: http://www.autumn-leaves.gruenrekorder.de

Reviewed by Jim Cummings

Angus Carlyle has put together a wide-raging collection of short essays, project reports, and interviews, which adds up to a wonderful introductory survey of the incredibly diverse types of thinking and creativity that are at work in the field of environmental and socially oriented sound art, while also providing those with years in the field with many morsels of new food for thought. One of the first pieces in the book, by anthropologist Tim Ingold, questions the very term "soundscape." Ingold suggests that "landscape" is inherently multi-sensory, unless extracted into a photo or painting, and that we don't talk about "lightscapes"; he worries that the word soundscape takes us in to a mental or material/objectification relationship with sound, which is better experienced as an "immersion in, and commingling with, the world in which we find ourselves." Interviews with Chris Watson, Max Dixon (London Sounder City project), and Alvin Lucier, submissions detailing some of the Finnish and Japanese soundscapes highlighted in their respective 100 Soundscapes projects, contributions by John Levack Drever, Phil Niblock, Charles Fox, and many others open windows into an array of ways of thinking about sound and listening, so when one opens this volume, a few minutes at a time, or in a single couple-hour immersion, we hear the world in new ways and our imaginations are fired with the possibilities for engaging the sonic aspects of our natural and built environments. Each submission is only two to four pages long, really just introductions to each personal approach to the topic, but Carlyle has quite masterfully found ways to encourage each author to get to the heart of his or her particular perspective in these brief moments. This is a volume well worth seeking out!

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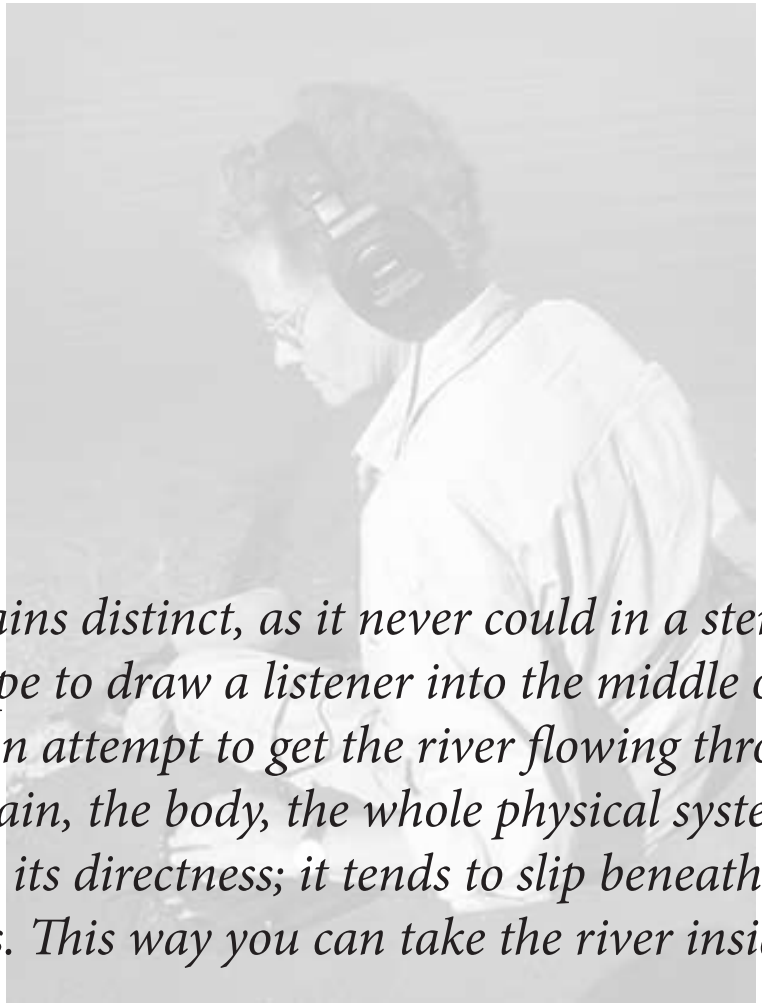

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—Annea Lockwood