

**CHRIS
MERCER**



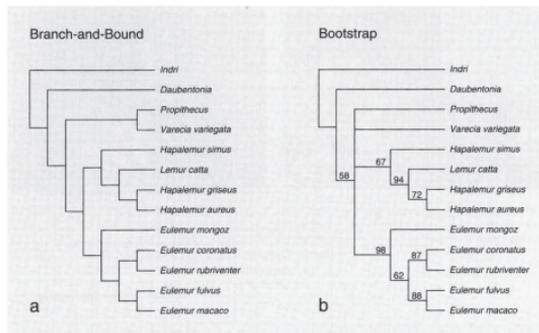
SIDEBAND RECORDS

**ANIMAL
COMMUNICATION
WORKS**

The Audible Phylogeny of Lemurs (2009–12) is the product of three years of research on prosimian primates, including work in residence at the Duke Lemur Center, where I had the privilege to observe and record semi-free range lemurs and to conduct a set of playback studies. The DLC is the world's largest lemur reserve outside of Madagascar, housing 250 or so highly charismatic animals, many of them in generous, forested natural habitat enclosures. This work would not be possible without the DLC and its knowledgeable staff and care technicians.

The piece is largely based on a 1994 study by Joseph Macedonia and Katherin Stanger-Hall, in which the authors evaluated communication evidence—primarily vocal signal information—to produce a lemur phylogeny (analysis of species relationships). Comparing the Macedonia/Stanger-Hall study to a more recent molecular phylogeny by Ann Yoder and Zihan Yang, I was struck by how well the earlier communication-based analysis held up—excellent news for an artist interested in animal communication. It suggests that, with proper context, the evolutionary story encoded in the vocalizations of modern animals is audible.

The Audible Phylogeny of Lemurs



Macedonia, Joseph & Stanger-Hall, Kathrin. (1994). Phylogeny of the Lemuridae Revisited: Evidence from Communication Signals. *Folia primatologica; international journal of primatology*. 63. 1-43.

About 12 different species are represented in the piece, although *Lemur catta* (the familiar ring-tailed lemur) and the closely related *Hapalemur griseus* are the most prominently featured. My goal is to preserve and augment the calls' natural characteristics and to group and combine them so as to illuminate relationships between calls of different species, making the phylogeny audible and the beauty and complexity of the calls accessible. You cannot simply pull up a chair at the DLC and hear these relationships unfold! The piece is assembled from many hours of recordings—a grunt here, a mew or wail there, occasionally a “scene.”

The vocalizations were documented for context of emission, cross-referenced with the scientific literature, and meticulously cleaned, enhanced, edited, and spatialized to reveal their acoustic structures and phylogenetic relationships. In several cases, I have used my own observations to augment or extrapolate from the literature, resulting (hopefully) in original insights on the relationships between calls. I am deeply indebted to biologist Joseph Macedonia for his guidance and input throughout this project; his authoritative work on lemur vocalization is the basis for this piece.

For detailed explanatory notes, sound examples, and video see:

<http://musictechnology.music.northwestern.edu/Mercer-LemurPhyl/START%20HERE.html>

<http://musictechnology.music.northwestern.edu/Research.html>

DIVERGENCE DATES FOR MALAGASY LEMURS 763

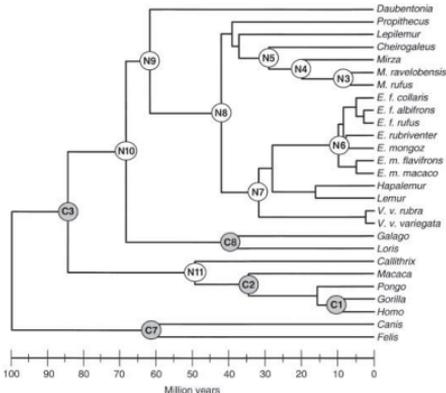


Fig. 3 Rooted ingroup tree assumed in combined analyses (columns 6 and 7 in Table 4). Branches are drawn to reflect divergence times estimated in ‘all genes’ combined analysis (column 7 in Table 4). Estimated nodes and calibrated nodes are indicated as in Fig. 1.

Yoder, Anne D & Yang, Ziheng. (2004). Divergence Dates for Malagasy Lemurs Estimated from Multiple Gene Loci: Geological and Evolutionary Context. *Molecular Ecology*. Volume 13, Issue 4. 757-773.

Echoes of Lemurs

Echoes of Lemurs (2006-7) explores relationships—evolutionary and ecological—among various mammals by examining and transforming their vocalizations. The focus is on primates—howler monkeys, chimps, humans, and especially lemurs, who are at the heart of the entire project, being the closest thing to a “living fossil” of the earliest primates, and acting as a sonic pivot point between primates and other mammals. Lemurs are among the most elaborately, diversely vocal of all nonhuman primates, the ring-tailed lemur alone possessing some 22 distinct adult vocalizations, with significant modulatory, combinatorial, and contextual variability.

Humans are represented in two forms: “Natural,” paralinguistic vocalizations (crying babies, sexual sounds) and cultivated or “extended” vocalizations—but no speaking or singing. The piece is concerned with vocal expressivity and communication systems that are not explicitly linguistic or musical in the usual sense.



Evolving Choruses (2009-10) uses acoustic instruments, found objects, and analog and digital synthesis to model bioacoustic choruses as found in rainforests, swamps, and other densely populated natural environments. The choruses in the piece evolve both as time-compressed representations of evening or morning progressions and as strings of speciation events shaped over much longer (hypothetical) time periods. The listener should imagine that all events in the piece take place in the same general habitat, but a morning chorus, for example, evolves in that habitat over millions of years and can be heard as a parallel to how such a chorus might evolve over a single morning.

Evolving Choruses

The progression of events:

Morning Chorus / Cut to Evening Chorus / Evolve to Morning Chorus (at a later time period) / Cut to Evening Chorus (far future, colder environment).

No animal or nature recordings were used in the piece.



Swampoid (2007) uses a set of amplified instruments—most of which were designed by the composer, a few of which are found objects—to simulate a swamp environment. Some of the materials are modeled directly on specific animal calls: Field crickets, bullfrogs, and American alligator mating calls. Others are indirect or “fantastic,” while still being recognizably birdlike or insectoid. Interactions between calls are modeled on specific natural events. For example, early in the piece a pair of creatures exchange territorial calls that increase in intensity to the point of alarm; at the midpoint of the piece, a predator bird lands and cries out, causing a defensive cessation of insect and frog calls, and eliciting a few alarm calls. The five performers are accompanied by a tape part consisting entirely of processed cicada recordings made by the composer in eastern North Carolina.



Swampoid

The piece was strongly influenced by the field recordings of Bernie Krause and David Dunn and, especially, the exquisite recordings of swamps in the southeastern United States by Lang Elliott and Ted Mack. It was also influenced in no small part by the composer’s own experience in swampy and marshy regions of North and South Carolina. The piece was premiered by Ensemble Ascolta at Donaueschingen 2008. In this recording, the composer performs all five parts.

Call Repertoire (2004-8) originated in 2004 as a work for two percussionists, 8-channel live electronics, and tape. The live version was performed by Domenico Martinez and Pascal Pons of Ensemble Surplus, with digital processing developed at Experimentalstudio SWR. The percussionists performed on a set of the composer's custom acoustic instruments, contact- and close-miked for amplification, live processing, and 8-channel spatialization. The present version incorporates all the original tape parts, a live multitrack recording, and the composer's own recordings on the instruments. The title borrows from the study of animal communication and refers to the set of calls emitted by a given species. The work is a musical exploration of bioacoustic communication heard through filters of wood, rubber, plastic, and metal. Unmistakable growls, moans, squeals, glottal pulses, and evocations of stridulation emerge from the homemade instrumentarium, describing a distinctly "communicative" sound world, with implied exchanges between actors in some unseen biodrama.

Call Repertoire



Chris Mercer

Chris Mercer received a B.M. in Composition at the University of North Carolina School of the Arts and a Ph.D. in Composition at the University of California, San Diego. His principal teachers were Chaya Czernowin and Chinary Ung, instrumental music, and Peter Otto and Roger Reynolds, electronic music. He has held artist residencies at Experimentalstudio SWR, Künstlerhaus Schloss Wiepersdorf, and Sound Traffic Control in San Francisco; his music has been performed by Ensemble Ascolta, Ensemble SurPlus, Fonema Consort, and Schlagquartett Köln. His electroacoustic music and research have focused on animal communication, especially nonhuman primate vocalization, including research residencies at the Duke Lemur Center, the Wisconsin National Primate Research Center, and the Brookfield Zoo. His instrumental music involves modified conventional instruments, found objects, and instruments of the composer's own design, in combination with amplification, live electronics, and spatialization. He has taught electronic music at UC San Diego, UC Irvine, and CalArts; he currently teaches in the Composition and Music Technology program at Northwestern University.



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Photos by Chris Mercer
Design by Ana Maria Bermúdez

The Audible Phylogeny of Lemurs

for 8-channel sound (2009-12)

1

[17:22]

Echoes of Lemurs

for 5-channel sound (2006-7)

2

[20:36]

Evolving Choruses

for 8-channel sound (2009-10)

3

[9:51]

Swampoid

for five performers and 2-channel sound (2007)

4

[8:12]

Call Repertoire

for 8-channel sound (2004-8)

5

[9:51]

The Audible Phylogeny of Lemurs and Echoes of Lemurs were made by possible by research conducted at the Duke Lemur Center (Duke University) in Durham, NC and by funds and equipment provided by Northwestern University.

Recording and Mastering: Chris Mercer
Album Design: Ana María Bermúdez
Produced by Chris Mercer and Hans Thomalla