Deep Listening to the Amazon Rainforest through Sonic Architectures

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De Rerum Natura is an electroacoustic composition by the author, based on field recordings from the Brazilian Amazon rainforest. The piece is part of wider research from the author that explores the act of listening, associated visual mental imagery and dynamic subjective links between the composer’s experience of listening to/recording experience of the original material and the audience’s perception of the final composition as it is performed. This article focuses on the author’s process of developing De Rerum Natura, based on Deep Listening. De Rerum Natura also examines the merging of the composition with the acoustics of the performance space.

Every man should pull a boat over a mountain once in his life.

—WERNER HERZOG

De Rerum Natura explores the sonic nature of the Brazilian Amazon rainforest. This environment is dense with sonorities; it absorbs and influences composers while they are soundwalking, spotting locations or recording. The ears and the mind are fully dedicated to listening, leading to vivid mental imagery included in this composition and transmitted to the audience during the performance. “To listen is to decode; it is to make sense of a sensory input” [1]. I have thoroughly investigated this approach—known as Deep Listening—in a prior study exploring visual mental imagery and audience perception of sonic artworks [2]. The field is discussed using Guattari’s ideas on ecosophy: “an ethico-political articulation . . . between the three ecological registers, those of the environment, of the social relations and of human subjectivity” [3].

These ecological registers appear in De Rerum Natura [4] as follows:

1. The (sonic) environment of the Amazon rainforest engages the listener in a sonic experience: Rainforest spaces and places are layered and recombined within the performance space.

2. The social relations are those of Amazon rainforest fauna and their sonic activity, since, per Oliveros, “animals are Deep Listeners. When you enter an environment where there are birds, insects or animals, they are listening to you completely. You are received. Your presence may be the difference between life and death for the creatures of the environment. Listening is survival!” [5] Careful observation during listening, including of this attention to survival, develops an experience of tension while recording.

3. Human subjectivity relies here on audience interpretation. The memories I captured of the Amazon rainforest translate my impression of the tension in the sound into visual mental imagery in the audience.

Barry Truax identifies soundscape composition’s goal as “the re-integration of the listener with the environment in a balanced ecological relationship” [6]. The link between the listener’s inner perception and the environment is indeed paramount.

In the first section below I map the typologies of spaces present in De Rerum Natura. Next, I present the specific recording strategies. In the third section, I discuss the influence of the performance space and the development of the composition. In the final section, I reflect on the achievements of De Rerum Natura and offer conclusions on the process of creating it.

MAPPING OF VIRTUAL AND REAL SPACES

De Rerum Natura emphasizes the listening experience with a dynamic link between the Amazon rainforest (real spaces) and audience perception (virtual spaces). Virtual spaces rely here on the relationship between sound and space as a merger within the mind of the listener. According to Dixon, Antonin Artaud may have first coined the term virtual; Artaud described in 1938 how “theatre’s virtual reality develops
... [on the] dreamlike level on which alchemist signs are evolved" [7]. Artaud establishes a relationship between the action of the theater and spectator perception. Sound does not carry its reality within itself but is comparable to a symbol that triggers virtual reality in the mind of the listener. The audience transforms those symbols into mental imagery. Georgina Born stresses that social mediation makes it possible to distinguish between the different degrees and kinds of co-present and virtual sociality, as well as of individuation and aggregation, privatization and public-isation, afforded by today’s ramifying musico- or sonic-social-technological assemblages [8].

_De Rerum Natura_ interprets Artaud’s signs more as triggering virtual reality and subjectivity than as a virtuality associated with technological apparatus. I approach space from an architectural angle, not merely seen as a container defined by borders and geometrical values (“the Receptacle not a Void”) [9]; I understand it as a sum of the relations between architectural elements and sites (of sounds). The architectural approach refers to spatial relationships between sound and space, and how the resonance, reverberation and vibrational properties influence sound in space—and vice versa. Such relationships define a sonic architecture, an immaterial architecture, an architecture of atmosphere.

The movement and the perception of the listener’s body in visual mental imageries are critical components that allow an embodiment of the architectural sonic space through sound, which leads to its embodiment in visual mental imagery. The sum of the relationships is felt and is actually the atmosphere that consequently affects and leads to perception within the body of the auditor. For Böhme, “perception is basically the manner in which one is bodily present for something or someone or one’s bodily state in an environment. The primary ‘object’ of perception is atmospheres” [10]. Therefore, atmospheric architectures are felt, and the relationship is established between the architecture and the body of the viewer/auditor. One’s body consequently becomes part of the work.

The perception of the body includes cues on the production of space as proposed by Henri Lefebvre, who emphasizes that “it is from the body that one perceives and lives the space and that it happens” [11]. The production of space develops in three ways within _De Rerum Natura_:

1. During field recordings, I (the author/composer) perceive the space while soundwalking, defining my compositional space by my own movements while Deep Listening. This is the first production of space, which is subjective and resides in the mind of the composer, leading to the initial layers of the composition.

2. During the compositional process, I classify the layers of sounds perceived while field recording into families of sound that “work” together, and I compose those layers in the studio, informed by my memories of the rainforest during the process of composition, as the audience consequently perceives.

3. The performance space, which already contains a quantity of spaces that I name internal spaces, receives the composition. Those internal spaces include an addition of reverberations, the sonic characteristics and sonic identities of spaces, places and locations. Thus, the addition of multiple spaces (by layering) of _De Rerum Natura_ produces a metaphoric sonic moiré pattern, a polyphony of spaces, that also integrates the performance space with its own resonant properties.

**STRATEGIES OF RECORDING IN THE AMAZON RAINFOREST**

I made the field recordings between 6 and 19 December 2008 at Francisco López’s Mamori Art Lab, a sound lab near Manaus in the Brazilian Amazon. I made the recordings at various times during jungle expeditions on foot or by boat (Figs 1,2).

My emphasis on Deep Listening during the recording process allowed me to concentrate on the perception of the environment. The positioning of the recording equipment in

![Fig. 1. Field recording location, Mamori Lake, Amazon Rainforest, near Manaus, Brazil. (© Luca Forcucci)](http://direct.mit.edu/lmj/article-pdf/doi/10.1162/lmj_a_01090/1884804/lmj_a_01090.pdf by guest on 30 June 2021)

![Fig. 2. Mamori Lake boat expedition for field recording. (© Luca Forcucci)](http://direct.mit.edu/lmj/article-pdf/doi/10.1162/lmj_a_01090/1884804/lmj_a_01090.pdf by guest on 30 June 2021)
the rainforest includes a sonic appreciation of the location. Regrettably, the recordings of wildlife suffered from the human presence of our group: around ten international artists, musicians and composers working with López. Therefore, López defined three main recording strategies:

- Set up the equipment after arriving on foot or by boat (pirogue) and wait for 30 minutes at 500 meters’ distance—at least. While waiting, avoid any noise, allow nature to absorb the human presence and proceed with Deep Listening.
- Arrange by boat (pirogue) on location and set up the equipment. Wait for 30 minutes; then, Deep Listening also can take place.
- Set up the recording equipment. Leaving the equipment on location, return to the base camp for two hours and deep-listen to the environment while walking back to camp.

Waiting and Deep Listening while recording enhances the composer’s visual and sonic memories; those memories are the initial elements of the future composition. The recording method follows precise steps to identify optimum locations, where no obstacles interfere and the composer can carefully listen, avoiding other human presence. “Carefully listening” to the locations means:

- Observing the environment’s acoustics (e.g. leaves, forest, open space, water, dryness versus moisture).
- Observing the diverse sound of the fauna with specific recording devices, like hydrophones to record pink dolphins or ultrasonic microphones to record bats.
- Typical birds—for example, the screaming piha—are part of the sonic identity of the Amazon rainforest, as is the spatial distribution of howler monkeys’ call and response. Recordings took place at specific times according to the activity of the animals. For example, howler monkeys tended to be more active typically around 4:00–6:00 a.m.
- Tension emerges while entering the rainforest—in the attempt to avoid snakes or when multiple eyes in the dark illuminated by the torch are those of alligators.
- Composers immerse themselves in Deep Listening.

The Amazon rainforest is so remote that one can concentrate only on the recording task with absolute dedication. The experience is so intense that the sounds become deeply engraved into one’s mind. The powerful images created by the sonic environment while recording and Deep Listening create the composer’s initial mental images. The final resulting imprint is the story told by the Amazonian space.

BACKGROUND

Says Pauline Oliveros, “sound impacts my body and resonates within. Sounds keep returning to me as I listen. Our vocabulary limits discussing inner or mental sound and sounding or listening in dreams and daydreams. We need words that highlight the auditory cortex” [12]. The interpretation of mental imagery triggered by sound needs such additional vocabulary. Oliveros’s practice of Deep Listening originated in a highly reverberating underground tank where she practiced with her Deep Listening Band (Fig. 3): “The cistern at Fort Worden, Port Townsend [Washington state] . . . is a 2 million gallon, 186 foot diameter water tank made of reinforced concrete” [13].

I attended a Deep Listening session, Listening for Peace,
at HAU 1 Theatre in Berlin [14], wherein Oliveros asked approximately 30 participants to sit on mattresses in the most comfortable position, and "don't discriminate [against] any sound, just let it happen." At the sounding of a small gong, the session began. Eyes closed, as I deep-listened, I day-dreamed. Time was no longer relevant. Tsabay proposes that "the practice of Deep Listening is concerned primarily with sound as a means for heightened environmental and body awareness, devoid of analytical thought processes" [15].

_De Rerum Natura_ is influenced by Varèse, Amacher and Nono's integration of the performance space into composition by transforming the space itself with sound projection. Edgard Varèse anticipated sound projection in the performance space as early as 1936: "The entire work will be a melodic totality. The entire work will flow as a river flows" [16]; "for the ear as for the eye, this phenomenon gives a sensation of extension, of travel within space" [17]. Maryanne Amacher integrated the architecture of buildings, specifically with her idea of "structure-borne" sound, in which the sound directly enters the structure and the architecture becomes an instrument. For De Benedictis, "the whole of [Luigi] Nono's output is based on the pursuit of new sonorities, requiring not only a different manner of experiencing sound (by performers and listeners) but also new configurations for concert venues" [18]. The performance space is augmented. It is no longer the space per se; rather, it is illuminated by the sonic in such a way that the composition interacts and merges with the performance space.

**ON THE INFLUENCE OF THE PERFORMANCE SPACE**

_De Rerum Natura_ exists once it is diffused and when the sounds dynamically incorporate the performance space during each concert. For Windsor, "the motivation for adopting an ecological approach in this context is to redress the balance between abstract approaches to musical structures and those that take into account the connections between sounds and the environment that produces them" [19]. The combination of field recordings and the live manipulation of rich material from the rainforest in the performance space, as well as the technology that allows the live manipulation of extensive sections of material, leads to an evolution of a language and form of soundscape composition. The greater the reverberation into a space, the greater the play with silences and resonances. The resonance of the performance space with the sound (as input) is interpreted by the composer: by reinjecting the sound live-captured with microphones (as output) and/or by playing with the diffusion of sound and the resonance. The perception therefore resonates with the performance space. The perception of the performance space's architecture changes according to the perception of the sound in the minds of the audience, listening with eyes closed to focus on sound and mental imagery. It is a movie for the mind.

The world premiere of _De Rerum Natura_, 21 August 2009 at Performance Festival, Belo Horizonte, Brazil, took place at Galpão Cine Orto, a 1920s cinema that had been transformed into a stage theater. The audience sat in front of the prosce-
between the space, listening and memory. This perception is the result of the projection of rich sounds and spaces from the rainforest into spaces of performance with different specific acoustic characteristics. The concept of the sonic moiré, of multiple auditory layers leading to an illusional pattern, is comparable to that which emerges visually in the Rotoreliefs of Marcel Duchamp, which he calls “nonretinal art”: something happening between the work and the viewer. In the current example, the sonic moiré takes place between the performed composition and the listener. The sonic moiré pattern changes according to the respective natures of each performance space and yields a movie for the mind.

**References**


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