PAITITI:
A MULTIMODAL JOURNEY TO EL DORADO

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This dissertation discusses the elaboration of *Paititi: A Multimodal Journey to El Dorado*. *Paititi* is an installation piece involving literary, visual and sonic elements inspired on the historical records of the legend of El Dorado. The piece addresses the current situation of the Amazonian várzea keeping as a geographical and historical framework the first expedition into the Amazon Basin, carried out in 1541 by a Spanish group led by Francisco de Orellana. The sonic profiles of several sites along the Amazon Basin were documented incorporating their temporal and spatial characteristics into the multimedia work.
My thanks go to my family and my friends for helping me to make it through all sorts of difficulties.

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To the ones I love.

Damián Keller
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This dissertation discusses the methods and concepts utilized to create *Paititi: A Multimodal Journey to El Dorado*. *Paititi* is an audiovisual installation that focuses on the current situation of the Amazonian region having as a geo-historical frame the first expedition into the Amazon, carried out in 1541 by a Spanish group led by Captain Francisco de Orellana. This multimedia piece is the result of reenacting this first European journey through the Amazon River with a strong historical and ethnological contextualization. Videoartist Ariadna Capasso and I followed Francisco de Orellana’s footsteps from Quito, in the Ecuadorian Andes, to Belém, in Brazil, where the Amazon River pours its waters into the Atlantic Ocean. This text provides a summary of the Spaniard’s extraordinary search for El Dorado in 1541, paralleled by our twenty-first century search for the search of El Dorado.

When I set out to work on *Paititi*, I envisioned a reconstruction of the key events in Orellana’s trip. Although the goal was not to produce a documentary, I was hoping to capture some of the sonic and topological characteristics of the places visited by the Spaniards in their journey. At an early stage in the fieldwork, both Ariadna and I realized that a literal reconstruction would be impossible: the impact of twentieth-century technologies was more pervasive than we had imagined. Throughout a five-thousand kilometer journey, I observed less than a dozen places where machine sounds were not a constant feature of the sonic environment. As it is usually the case in ecologically-based composition, while pondering over the materials, I had to reconsider the objectives of the piece. Thus, the focus of *Paititi* was redimensioned to include the current situation of the Amazonian várzea, placing as a backdrop the historical aspects of the search for El Dorado.

This thesis addresses three specific facets of the installation *Paititi* and deals with two areas of research in multimedia works: 1. It discusses the conceptual basis of the installation *Paititi*; 2. It documents its historical and ethnological foundations; 3. It offers a technical description of the synthesis, transformation and structuring processes utilized; 4. It discusses the concepts underlying the ecological approach to composition taking this perspective into the realm of multimedia works; 5. It establishes a theoretical basis for the composition of multimodal works.

The text is divided into five sections. The first one expounds on the theoretical and methodological implications of composing multimodal works. The second section addresses the conceptual basis of the ecological approach to composition extending previously published research (Fontenele, 2004; Keller, 1999; Keller, 2000; Keller and Truax, 1998). The third chapter offers a series of snapshots of the first European expedition along the Amazon River. The objective of this section is to provide the historical framework for the discussion of specific conceptual points in *Paititi*. The fourth section focuses on present-day life in the Amazon River Basin as observed during a five-thousand-kilometer journey done by Ariadna Capasso and myself at the end of 2002. The historical and ethnographical data on the Quijo,
Omagua and Tapajó complement these observations. The fifth and final section brings together the conceptual issues addressed in each chapter of *Paititi*; thus, providing concrete examples of the ideas heretofore discussed.
Chapter 2 - Composing Multimodal Environments

This chapter expounds on the main compositional concepts underlying the multimedia work *Paititi: a Multimodal Journey to El Dorado*. The ecological approach to composition is discussed with the context of installation art. Reenaction and accumulation are proposed as organizational methods. Form is defined as an emergent property of concurrent processes. The integration of the spatial distribution of sources with the sound synthesis processes is suggested as a way to create a seamless transition between the realms of foley sounds and musical sounds. The section concludes with a discussion of how context, time and space can be brought together within a unified compositional paradigm. The installation is proposed as a space of interaction between the public and the piece’s materials, in which the experience of the creators is coupled with that of the audience.

Why installation art?

S. Emmerson (2001, 19) states that electroacoustic music has the power to revitalize the social aspects of music by providing both a quality listening experience and a space for social intercourse. He suggests three possible scenarios: (1) the multimedia space, where music, visuals, and socializing are combined; (2) the auditorium, where in-depth listening and concentration are encouraged through the use of three-dimensional sound rendering techniques; and (3) the installation space, which allows the coexistence of detailed listening of spatially-distributed sources with active social interaction.

Emmerson supports the idea that installation art erases the boundaries between listener, performer, and composer. Even though this is true for many works, there are certain mechanisms that must be in place to realize the potential of multimedia environments. In contrast with the traditional concert setting, installation music can be experienced both through its temporal and its spatial dimensions. The perception of the work requires a commitment from the listeners / participants in the form of an action. In the simplest case, this action is their movement through the space. Given the dynamic nature of sound sources, while the listeners change their location, the timbral and spatial qualities of the sources vary concurrently. Nevertheless, this is merely the most basic type of interaction. A more complex dynamic is created when the distribution of sources is dependent on the actions of the listeners. In this scenario, different forms of mappings between the music’s temporal dimensions and the characteristics of the space can be established. Furthermore, the spatial layout of the sources suggested by the imagetic material can also be manipulated in relation to the distribution of the sound sources. The artwork is thus opened to multimodality (Keller, 2001).
Figure 1. Axes of multimodal works that engage sonic, visual and interactive elements.

The installation space provides an ideal setting for artworks that organize their visual and sonic elements as a form of interaction with the audience (Keller, Capasso, and Wilson, 2002). Figure 1 depicts the three axes that define the multimodal artistic experience. As it can be seen in *Pauiti*, it could be argued that the action of the audience upon the artistic material is one of the key differences between fixed formats, such as audiotape pieces, and open formats, such as interactive installations.

**Hierarchy and heterarchy**

Within the realm of computer music compositional approaches, G. Lewis (2000, 36) has suggested that African-American aesthetics can be clearly differentiated from Eurocentric approaches. Whereas the former present a tendency toward a high density of events in a relatively short time, the latter usually feature slowly moving timbral narratives. This observation may sound overly simplistic, but it highlights the existence of opposed underlying philosophical views determining the choice of compositional frameworks. The visible (or better, audible) aspect of the frameworks is their sonic result: high density of short events vs. slowly evolving fused textures. Nevertheless, the most relevant aspect is the process underlying the temporal structure of the music.

In 1986, Lewis implemented *Voyager*, an improvisational environment where form is the result of interactions among multiple processes. These processes are established locally and form a loose heterarchy which influences the various temporal layers of the musical work. There is no single unifying principle. The work is proposed as a field of possibilities which are realized during the performance of the piece. The interaction of the various processes and the actions of the performer determine the final form of the piece.

Xenakis’s (1992) stochastic music is probably the most influential among the several examples of hierarchical compositional methods found in computer music literature. In the early sixties, he produced a series of instrumental pieces using the software *Stochastic Music* to generate data in text format which
he later transcribed to musical notation. *ST/10* is one of the large-ensemble works in this series (Xenakis, 1967).

Xenakis’s (1992, 134) precompositional plan is to create a work that “consists of a succession of sequences or movements each *a* seconds long.” We see that although all movements share a common algorithmic origin, their temporal evolution and their length are not based on sonic relationships among sections. Conceptually, each section is a separate entity linked to the other sections by their placement in succession. Furthermore, the length of the section is not determined by the dynamics of its material but by a top-down strategy: all lengths are calculated stochastically before the parameters of the sections are generated. Thus, Xenakis obtains a “temporal mold” which he applies onto his material (Keller and Ferneyhough, submitted).

Xenakis’s *ST/10* and Lewis’s *Voyager* present contrasting different organizational processes. While Lewis’s work is shaped by the local musical variables, Xenakis’s *ST/10*’s structure is not affected by compositional decisions at a local level. Furthermore, *ST/10*’s temporal mold predates the existence of the work as a whole. Lewis’s observations can be further qualified in light of these findings. The formalist approach that permeates Eurocentric music can be characterized by its methods of musical organization and by the temporal levels at which these methods are applied. In top-down hierarchical frameworks, the local characteristics of the music have no impact upon higher levels of musical structure or on the formal mechanisms themselves. Heterarchical compositional systems provide an alternative to the formalist approach. These systems allow the composer to establish a dialogic relationship with the materials, where musical form is not the result of one-way control algorithms but emerges from the interaction among several concurrent processes (Keller, 2001).

**Reenaction as a compositional paradigm**

The ecological approach to composition provides methods of organization that are applied concurrently at several temporal levels (Keller, 2000). At the finest temporal level, the actions of agents on objects furnish the sonic material. At the structural level, the material is offered as sets of open-ended combinations which are regulated by the actions exerted by the public within the installation space. The process of gathering raw material consists of reenacting the situation suggested by the historical and sociological data.

Actions and affordances guide the compositional working method. The objects’ affordances constrain the agents’ actions and determine the meso-level characteristics of the resulting sonic material. The physical qualities of the materials define the spectral content of the sounds produced. The agents’ actions limit the possible behaviors of the sound sources in space. Based on the observed actions, this
behavior is modeled by placing constraints on the distribution of sources. Consequently, the sound sources within the installation space will be consistent with the spatial behavior of the sources modeled. The ever-changing qualities of environmental sounds are replicated by the use of large sound databases which are randomly sampled. This process is determined by the presence of the spectators in the installation space, i.e., by their actions. Finally, the historical and geographical framework of the piece is in fact reenacted at the moment of data collection and refabricated once again during the actual presentation.

**Accumulation as a form-bearing method**

The processes of accumulation and timbral transformation inform the techniques employed to generate the synthetic sound material utilized in *Paititi* (Keller and Berger, 2001). Within the context of ecologically-based works, short samples, or grains, are extracted from the recorded sources. These grains provide the basic spectral and micro-temporal features of the sounds to be synthesized (Keller and Truax, 1998). Short events, modeled after the characteristics of a chosen recorded sound event, are synthesized by using constrained random distributions of grains. Once the events are synthesized, I recombine them in two ways: intraclass and interclass. Intraclass combinations provide events with a greater number of meso-temporal elements, adding depth and volume to the sound. Interclass combinations create fusions and hybrids among sonic classes, extending the sonic palette into the realm of the imaginary.

The transformations applied to the recorded and the synthetic materials are also guided by the objective of obtaining smooth transitions between the environmental sonic space and the modified sonic elements. After obtaining several hundred simple events through ecological modeling or through temporal and spectral transformations, I merge these events using constrained stochastic algorithms. When dealing with meso-temporal patterns, this method ensures consistency at a local level while creating a variety of global behaviors (Keller, 2000). Especially in the case of sonic classes generated by physical agents (Keller, 1999), these methods create patterns not attainable by traditional synthesis techniques.

In the case of *Paititi*, I have edited around twenty gigabytes of sound files. This massive amount of data is required by the characteristics of the material: environmental sounds become mechanical and lifeless if they are subjected to simplistic processes such as looping or repetition. Given the large quantity of sound files, a key aspect of the compositional design lies in the organization of effective sonic combinations by means of a well-structured sound database. The sonic behaviors obtained through the synthesis and transformation processes provide a range of events going from simple, ‘realistic’ sounds to complex, multifarious ones.
Multiple views of single entities

A work that features such distinct materials as those gathered through a five-thousand kilometer journey requires both coherent and selective recording and editing methods. One of the guidelines used to organize the visual and sonic material in Paititi was the use of multiple views of single entities.

This technique was applied to the video recordings through the use of two simultaneous cameras filming from different angles and by making multiple takes of a single location. As much as time and conditions permitted, many locations were filmed at different times of the day to capture changes in light and atmosphere.

The use of a quadraphonic recording setup allowed us to obtain sonic material that retains the distribution of sound sources in the two-dimensional field. Recordings were usually over thirty minutes long in order to capture slow variations in the behavior of the sources. Highly distinct sonic behaviors were observed depending on the time of day and on the location. The recordings span morning, afternoon and night schedules, including the rainforest’s busiest times of dawn and sunset.

Image-sound: non-univocal relationships

Standard film-editing practices, particularly within the realm of sound design, establish a direct cause-effect relationship between images and sounds. Foley sounds are applied according to parameters determined by image angle and distance. Abrupt cuts and amplitude changes are imposed on the sound material, strictly following the changes of camera position in relation to the filmed scene. Sonic time thus becomes a slave of image time. Furthermore, the musical soundtrack is usually unrelated to the foley track and is molded within the straight-jacket of instrumental thought. Cases of integration between foley and musical elements - although highly effective - are rare.

Ecologically-based techniques provide a framework to explore the integration of images, sounds and space. This integration is established by exploring the continuum along the following dimensions: foley sounds - musical sounds, spatial distribution of sound sources - temporal distribution of sound sources. Various possible relationships between images and sound have been explored in Paititi.
1. The sonic events are directly correlated to the imagetic events. This procedure is akin to the traditional foley track editing. Nevertheless, the ability to deal with the spectral and temporal fine structure of the sounds opens up the way to unexpected sound-image combinations (Keller and Carroll, 1999).

2. The sonic events are decorrelated in relation to the imagetic actions. This procedure creates a temporal paradox between images and sounds which can be explored along the temporal and / or the spatial dimensions.

3. The sonic events are unrelated to the imagetic content. This is the usual case with the traditional musical soundtrack. Given the referential quality of environmental sounds, their musical transformation provides a rich source of associations that can be explored to create eerie and dreamlike sonic environments.

The independence of the sonic events’ temporal dynamics allows for the three types of image-sound interactions described above. Interesting effects emerge out of the combination of matched and unmatched image-sound elements at the various levels of organization. For example, as explored in the opening section of Drop (Keller and Carroll, 1999), meso-time patterns such as imagetic water drops can be correlated to sonic broken glass bits. The integration of the spatial distribution of sources within the musical organizing processes creates a seamless transition between the formerly separated realms of foley sounds and musical sounds.

Open form

The installation format demands both a tight relationship between images and sounds and very flexible temporal patterns of organization of audiovisual material. Video images establish temporal cues which have to be carefully manipulated in order to integrate the temporal patterns presented by the imagetic actions and the temporal patterns obtained through the editing process. In ecological parlance, we could say we are dealing with meso-level patterns - imagetic actions - and macro-time patterns - editing-based sequences of events. This means that the temporal organization of a video scene is the result of the temporal material provided by the raw images, molded by the macro-temporal distribution of the edited video frames.

The interactive setup within the installation space provides yet one more level of temporal control. The sequences of video scenes are organized according to the parameters determined by the interactive system. The selection process is random within each scene. Thus, every listener experiences a different version of the piece depending on two parameters: (1) the state of the sensors, and (2) the specific audiovisual event being played. A flexible modular structure must be designed in order to allow for the various possible combinations of scenes.
Three processes underlie Paititi’s temporal and spatial structure: accumulation, modularity and interaction. Accumulation informs the way sonic materials are created and organized. Sound events are constructed by modeling environmental sources and by creating timbral transformations among existing sonic classes (Keller, Capasso, and Wilson, 2002). The synthesis methods exploit overlap and accumulation by building up complex events from the sonic micro-level, i.e., the grains. Paititi’s chapters are independent modules composed of several scenes. Each chapter can be experienced as a self-contained piece. Scenes are organized through a sequential process of accumulation yielding multiple views of single entities. The third organizing principle - interaction - is established by the relationships between the visual and the sonic material, the sounds and the space, the behavior of the public and the temporal structure of the piece. The presence of the public triggers sonic and visual elements within the context of each chapter. Thus, the overall effect of the piece is never the same.

**Anchors**

The focus of soundscape composition has traditionally been the sonic environment itself (Schafer, 1977; Truax, 1984). By contrast, the ecological approach emphasizes the relationships between the compositional processes and the geographical, ethnographical, and historical factors that inform the piece (Keller and Capasso, 2000). From this perspective, the creative context becomes an integral part of the work. Furthermore, this dialogic relationship between extra-musical sources and compositional methods sometimes creates acute contradictions within the piece steering the compositional process toward new directions. The creation of Paititi is a case in point.

The Paititi project, as it was laid out at the beginning of the twenty-first century, proposed a reconstruction of the first Spanish voyage through the Amazon River. In light of the data gathered during the Keller-Capasso expedition, the original project had to be restructured. Paititi, in its final form, presents a reflection on the current situation of Amazonian peoples, keeping as a backdrop the historical processes of exploitation of the natural resources and their consequences on the environment and the local communities’ ways of life.

**Putting together context, time and space**

As Georgina Born (1995) stated, a large portion of current computer music research and composition locates itself within the cultural practices of European concert music. Mirroring a wider spectrum of music-related activities, such as mainstream musicology, music psychology, orchestral composition, etc., some electroacoustic composers maintain that their practice is independent from social, political or racial concerns. They hold that music should represent a universal and timeless language. This concept
may appear innocuous in itself. But when backed by institutional structures and educational practices, it becomes a powerful mechanism of censorship and, more important, a *de facto* measure of artistic quality.

Ecologically-based methods offer a viable alternative to the, supposedly, culturally-neutral compositional approaches. Some areas of musical practice that have been addressed by the ecological perspective are: (1) audiovisual material collection, (2) sound synthesis, (3) sound processing, (4) spatialization, (5) audience / artwork interaction, (6) musical analysis. Within the ecological methodology, sound events are the result of the interaction among sonic elements at multiple temporal levels. Just as musical form is an emergent property of the distribution of sound events in time and space. Macro-level processes are shaped by the action of the public within the space of the work. Thus, the artwork comes into being by the dialogic relationship between public, processes and materials.

Current mainstream compositional practices in Europe and North America foster the creation of works rooted in the traditions of nineteenth and early twentieth-century music. These pieces usually make reference to previous musical works but are seldom engaged with issues outside the realm of pure or abstract music. More surprisingly, the absence of historical, geographical and social grounding is often upheld as a virtue! Although the exploration of new techniques and compositional methods was widespread during the early days of electroacoustic music, the view of composition as abstract sound organization has remained almost untouched (Keller and Ferneyhough, submitted). The most notable figures to subscribe to an autonomous view of music were I. Xenakis, K. Stockhausen and P. Boulez.

In contrast to the mainstream, starting in the early seventies, an environmentally-grounded approach to music began to gain popularity (Schafer, 1977). Soundscape composers applied cutting, splicing, and mixing on recorded sounds, generally keeping processing and transformations to a minimum (Westerkamp, 1996). As a reaction to the dominant autonomous approach, soundscape composition enforced a careful contextualization of the recorded sounds. Thus, composers strove to place sound sources within a specific social, cultural, and geographical milieu (Truax, 1996).

The ecological approach to music composition has been inspired by the soundscape tradition in regards to the importance given to the extra-musical content of the artwork. Taking the concept of contextualization a step further, ecologically based techniques provide tools to deal with perceptually relevant sound parameters. By zeroing in on the structure of the sound event itself, it becomes possible to extend the network of meanings along most time scales and into the realm of perceptual cues (Figure 2). Moreover, the distribution of sound in space is made available as a variable that can be linked to concurrent processes on the temporal axis. As a result, the procedural relationships between time, space and compositional processes open the door to an interesting phenomenon in music composition: form emergence.
Summary

The artwork and its sociocultural environment are engaged in a permanent process of mutual
determination. While the environment constrains the musical parameter space, the artwork reshapes this
environment. In Paititi, the limits between the real and the fictional are questioned by the placement of
actual and imaginary events within the context of a constructed space. This manipulation of reality
exposes the dynamics of the hegemonic media discourse. Contradicting world-views are actually
reenacted by bringing the social, geographical and cultural contexts into the dialogic process of art
creation. During the few moments of artistic fruition, the arbitrary frontiers between the social and the
individual are lifted.

Paititi’s temporal organization could be compared to the structure of a mobile, where all parts of the
piece are related and interchangeable. Interaction, modularity and accumulation are the three processes
that permeate the temporal structure of the piece. Paititi is divided into five chapters that can be
experienced as independent works. The sequence of chapters is determined by the spectator. Each
chapter is inspired by different aspects of the Orellana expedition, mirrored by the materials obtained
during the Keller-Capasso expedition. The chapters are divided into sections which develop a single
theme from different perspectives.

The organizational procedures utilized in Paititi aimed at obtaining multiple views of single entities.
The visual material was edited to reflect the concepts of circularity and recurrence. The sound materials
were generated by means of ecological models which provide for an endless variation of unique events within unified sound classes. Accumulation was the basic process employed to create complex sound events. Sound materials were recontextualized by manipulating their temporal and spectral structure in order to create interrelated sonic classes.

The process of interaction between the audience and the artwork taking place in open-form installations can hardly be attained by other genres. Hence, it becomes a distinctive feature of installation art. The work comes to existence through the physical action of the viewer / listener who thus becomes composer / creator. Moreover, the final form of the piece is not defined by the action of a single person but by the compounded actions of the audience experiencing the work through time and space. In other words, installation art can only exist as a social product, a product that has no owner.
Chapter 3 - Ecological Theory, Models and Composition

This section deals with the compositional paradigm utilized in Paititi: A Multimodal Journey to El Dorado. The discussion is divided into three parts which analyze complementary aspects of the ecological approach to music composition. The first part presents the grounding concepts of an ecological theory of sound. The second segment provides a detailed description of the required attributes of ecological models. The final portion of the text focuses on the synthesis framework applied in ecologically-based composition.

Part one: An ecological theory of sound

Since the turn of the century, several researchers and musicians have adopted methods and theories based on J. J. Gibson’s (1966) pioneering work on ecological psychology. In 1997, B. Truax and I implemented environmental sound synthesis techniques, employing constrained parameter ranges within the context of granular methods. Synthetic events included bouncing, scraping, and breaking (Keller and Truax, 1998). More recently, A. Di Scipio (2000) has demonstrated how iterated functions can be used to synthesize various environmental sound textures. AlcauPSIL - a system developed by F. Lopez-Lezcano and me - brought space into the realm of ecological models (Keller and Lopez-Lezcano, 2002). The development of tools points to the necessity of a broader conceptual ground for ecological modeling. This section builds upon previously published research (Keller, 2000; Keller and Berger, 2001; Keller and Capasso, 2000) in an attempt to set the groundwork for an ecological theory of sound.

The personal environment

Our perception of the environment is shaped by the constant interactions with the objects and beings that surround us. These interactions are constrained by the possible actions that can be exerted upon the objects, that is, by their affordances. The permanent cycle “action / perception / attunement / new action” is at the core of the process of adaptation to a new environment. Or, more accurately stated, the mutual adjustment between environment and individual can be observed through the set of affordances that emerge out of this process (Warren and Verbrugge, 1984).

Thus, the history of interactions between a sound-producing agent and a resonant object determines a subset of ecologically meaningful actions that can be exerted on the object. A sound-producing agent perceives the environment through the sonic possibilities afforded by the extant objects and agents. Generally, we could say that the environment is just a collection of affordances. Because the latter are dependent upon the agent’s personal history of interactions, we have to restrict our definition of
environment to the specific relationship agent-environment, that is, the *personal environment* as previously described (Keller and Berger, 2001).

The event

From an ecological perspective, action can be defined as dissipation of energy by an agent on an object through the latter’s affordances (Gibson, 1966; Michaels and Carello, 1981). Because of the constraints established by the current set of affordances, not all forms of energy transduction between an agent and an object constitute an action. Sonic affordances are the subset of attributes of the object that effect sonic behaviors. In turn, musical affordances are a subset of all sonic affordances (Figure 3).

![Figure 3. Musical affordances, sonic affordances and affordances.](image)

Therefore, the only types of action that are relevant to ecological modeling of sound are the actions that exploit the sonic affordances of the object. The sound event is effected by the dissipation of energy by an agent on an object through the latter’s sonic affordances. Consequently, the sound event is necessarily constrained in its temporal and spatial attributes: it is a finite, spatially-localized event.
The sonic field

At this point, it is possible to reformulate the concept of soundscape to fulfill the more exacting demands of an ecological theory of sound. The term coined for this purpose is the *sonic field*. The sonic field is a set of sound events being perceived by a listener at a specific time in a specific location. The window of observation is determined by the behavior of the listener within the space. Thus, a prerequisite for the existence of an ecologically-valid sonic field is a space-time horizon. In its simplest form, a listener in a fixed location determines a static spatial horizon limited by the attenuation of sound through the surrounding media. In this case, the temporal horizon is abstracted because of the lack of motion of the listener. Therefore, the temporal distribution of the sources is determined by the dynamics of the sound events within the sonic field. A more involved configuration is produced when the listener approaches a predefined location and recedes from it. The fixed reference is provided by the space’s acoustical properties and by the static sound sources. The spatial horizon changes according to the position of the listener. The temporal horizon is determined by his / her complete motion of approaching and receding.

Summing up, the sonic field can be defined as a space-time distribution of sound events produced by actions constrained by sonic affordances within a spatial and temporal horizon determined by the behavior of the listener. In the section devoted to compositional methods, I will discuss the use of the sonic field as a compositional tool. Particularly in the case of audiovisual works, the sonic field provides a consistent framework to deal with the relationships between visual cues and spatially-distributed sonic sources.

The sound class

As stated above, the sound event is the result of the dissipation of energy by an agent on an object through the latter’s sonic affordances. Each event constitutes a unique instance, temporally finite and spatially localized. As long as the events can be perceptually recognized as the result of a specific interaction between an agent and an object, they are classified as belonging to a single sound class. Complementarily, a stable form of interaction between the agent and the object is usually described as a sound source. Thus, a sound class is a collection of events that share the same source.

The cues that determine most heavily whether an event belongs to a given sound class are the micro-temporal and spectral characteristics (Bregman, 1990). Meso-temporal cues establish interrelated sound classes, and spatial cues provide ways to fuse or parse classes which are correlated along the temporal and spectral dimensions.
Part two: Attributes of sound models

Although this may seem paradox, an advantage of ecologically-based synthesis over other approaches is its ‘inaccuracy.’ Ecological models utilize perceptually-based cues rendering events that can be strikingly similar to the modeled real-world sounds. Because models are not required to reproduce the exact physical behavior of the system, some constraints that usually make the modeling task very demanding and time consuming may be loosened. Even though parameter ranges and high-level time processes have to be carefully tailored to abide by ecological rules, models are not required to reproduce the physical characteristics of the system under study. Of course, physics-based processes can be incorporated into existing models. But realistic results have been obtained by applying less-demanding techniques such as sample-based granular synthesis (Keller and Truax, 1998) and iterated functions (Di Scipio, 2000).

Because of some similarities and shared motivations, some researchers have not made a clear distinction between physical modeling and the ecological perspective (Roads, 2002; Windsor, 1995). Make no mistake. Ecological modeling is NOT a form of physical modeling. To clarify this issue, I will try to formulate what an ecological model is and what it is not. The following sections list the basic requirements of a well-behaved ecological model, including modularity, stability, consistency, context-dependence, scalability, and excluding isomorphism, playability and identity.

Modularity

Among the basic requisites of good modeling practice is the development of models consisting of functional modules. Each module encapsulates the behavior of part of the system. As I will discuss later, an ecological model does not need to be isomorphous with the modeled phenomenon. Furthermore, finding a good balance between generality and specificity (Truax, 1984) should provide for a model that does not need too many control parameters but which still provides handles for compositionally useful transformations.

Stability

The issue of modularity is directly related to the stability problem. Ecological modules should be applicable to different contexts. Sometimes, a module may not behave as predicted when interacting with other parts of the system. In this case, the module has to be constrained to a well-delimited set of contexts. A typical example is the relationship between meso-temporal patterns and spectral
characteristics. The example presented in the next section will show how the manipulation of a model’s parameters may compromise its perceptual outcome.

**Consistency**

A key issue in rendering synthetic sounds akin to real-world events is the consistency among the perceptual cues. This consistency is required on two levels: (1) among variables on a single temporal level, and (2) among behaviors on different temporal levels. A good example of consistent cues is provided by the breaking glass simulation (Keller and Truax, 1998). Breaking is simulated by a combination of two modules. One module establishes the distribution of collisions over time, i.e., the temporal pattern; another controls the local characteristics of the grains, thus providing a handle on the spectral profile of the event. If this profile matches the attributes of a breakable material, such as glass, the temporal pattern of the event is perceived as breaking. If the spectral profile corresponds to a material that does not afford breaking, such as water, the perceptual outcome is shifted to the closest class where temporal and spectral patterns are consistent, for instance, spilling.

**Context dependence**

The same parameters defined for consistency can be applied to time-based changes in the model’s behavior. Ecological models should remain attuned to their context. This is done by means of a database that gathers information on the interactions between user and model. This information is both objective (data describing the contents of the sound database) and subjective (user-defined descriptors). By sharing subjective data, multiple users create a 'community' that imparts a common behavior to the models.

**Scalability**

The final requirement of a well-behaved ecological model is a characteristic related to stability and consistency: scalability. As stated by C. Rolfe, a good model should provide graceful transitions between different states (Rolfe and Keller, 2000). An example of a scalable model is the rain model used in Keller (1998) and reimplemented in *AlcauPSIL* (Keller and Lopez-Lezcano, 2002). Even though the model can create several different behaviors such as dripping, a water stream - as might be found in a creek -, and several classes of rain, the states which do not correspond to these readily recognizable classes are not alien to the behavior of water drops on Earth.
The required behaviors of ecological models include the following attributes: modularity, stability, consistency, context-dependence and scalability. The next section will address various characteristics that are not paramount to the ecological framework.

**Isomorphism**

As it was seen earlier, an ecologically-based sound model can be isomorphous to the process it attempts to replicate. But this is not a requisite. Early physical models were always true to this rule (De Poli, Piccialli, and Roads, 1991). The results were inefficient implementations which were not practical for compositional purposes. Current modeling techniques usually simplify computations by lumping (Smith, 1997).

**Playability**

Most physical models can be excited by direct action from the user. This paradigm is necessary when dealing with musical instruments since they are directly activated by human agents. The instrumental model reacts to the action of the user by producing a sonic behavior which is directly correlated to the action exerted on the model.

By contrast, many classes of environmental sounds are not produced through direct action from an agent but by autonomous processes unleashed through an initial energy input. Examples of these types of process are bouncing and breaking. Furthermore, if the objective of sound synthesis is to create a realistic simulation, events caused by physical agents should not be controlled by human gesture. This is the case with the rain and wind models.

**Identity**

The validity of current analysis / synthesis systems is usually verified through a straightforward but implacable test: analyzed and synthesized sounds must be close to identical (Ellis, 1996). Ecological models are tested using a very different procedure: the model should not literally reproduce the modeled sound but only its most salient characteristics. Furthermore, not two instances of the model’s behavior should be the same.

Ideally, the ecological model generates a variety of sounds that share common perceptual cues and that simultaneously have a wide range of variations in their micro and meso-level characteristics. This type
of behavior is a feature of everyday sounds and sets them apart from instrumental sound classes. As discussed in regard to playability, instrumental models should provide a temporal output which is directly correlated to the energy input provided by the user. This is the basis upon which notated music functions. Everyday sound events do not need to follow this mold. In fact, the wider the range of behaviors the closer the model will be to real-world types of interaction. We could say that just as physical modeling fits the niche of orchestral sound, ecological modeling fulfills the needs of environmental sound composition.

**Part three: Composing from an ecological perspective**

The ecological approach to sonic composition has been developed as a means to encompass multiple aspects of music making in a coherent, theoretically grounded methodology (Keller, 1999a). The microstructure of the sonic material is shaped after the patterns obtained from sonic events that take place in our day-to-day environment. The work is a by-product of the process of reenacting the situation chosen as a theme. That is, materials are collected within a predefined geographical region, while compositional processes are shaped after the historical and social context where the action takes place.

**Meta-Composition**

According to the temporal level chosen, composition can be thought of as the process of organizing three types of elements: 1. graphical symbols (e.g., notated instrumental music); 2. control streams (e.g., real-time electronics); or 3. sound samples (synthesized music). Current techniques in digital signal processing have opened up the door to the finest levels of temporal structure (Roads, 2002). While the ability to deal with sound data at the sample level gives access to modifications of the spectral and spatial characteristics of recorded sounds, it also presents a serious danger: sample-based processes may distort or destroy ecologically relevant information.

Standard studio methods in electroacoustics involve successive autonomous stages. First, sounds are recorded and digitized. Subsequently, they are edited and processed. At last, materials are mixed and the resulting piece is diffused. The independence among these stages facilitates the working method but simultaneously imposes a grave limitation upon the compositional methodology: no parameter can be correlated across stages, thus materials, transformations, and localization of sounds become unrelated. Ecologically-based compositional tools allow for perceptually meaningful transformations of materials, providing means to deal with spectral, temporal and spatial aspects of sound. Thus, these methods permit a coherent organization of sound while safeguarding its ecological validity.
Time, energy, space

Generally speaking, ecological models represent forms of interaction between agents and objects which occur along three dimensions: time, energy and space (Figure 4). Each axis is determined by $n$ dimensions that do not necessarily represent linear or continuous mappings. For instance, time is mapped onto finite segments called events. These events are shaped by patterns of interaction between agents and objects. The processes that shape these patterns take place at three temporal levels simultaneously: micro, meso and macro (Keller, 1999a). By the same token, events are constrained by processes that unfold at much slower rates, e.g., the muscular force exerted by a man hammering a nail could be roughly correlated to his age (measured in years) as opposed to the hammering action itself (measured in seconds).

The second dimension of ecological models - energy - is the result of complex interactions between the excitation and damping processes. These processes determine how energy enters the resonant system and how it is dissipated. The type of excitation, the state of the object, and the forms of interaction among excitation and resonance systems give shape to events. Generally, correlations and constraints on variable ranges within finite time segments approximate the behavior of real-world sound producing processes. In ecological parlance, these constraints are encapsulated in a single concept: affordance (Warren and Verbrugge, 1984).

The usual representation of the third dimension of ecological models - space - consists of three axes: azimuth, elevation and distance. Nevertheless, if events are to abide by ecological rules, arbitrary mappings of temporal patterns onto these axes are not possible. The limitations are not only determined by physics - for example, the speed of sound in air - but by the available modes of interaction between agents and objects, and by the types of actions afforded by the agents. In other words, the interaction between agents and objects is constrained by their affordances. A simple example is provided by a bouncing ball.
The spatial displacement of the ball is constrained by the ratio between the angular and the vertical displacement. On a scale of zero to one, when angular displacement approaches one, the behavior of the ball is closer to either rolling or flying rather than to bouncing. When the vertical displacement reaches one, the ball is bouncing without any angular movement (quite unlikely!). The period of a bouncing ball can only reach a maximum value of a few seconds. A larger delay between bounces would imply heights that can hardly be attainable by a ball bouncing on Earth’s surface.

Events

The temporal evolution of a sound event is defined by dynamic interactions between two processes: excitation and damping. A simple algorithm accounts for the possible configurations of these interactions: \( x(t) = x(t-1) + a \), where \( x(t) \) stands for the energy state of the system at time \( t \), and \( a \) is the excitation or damping coefficient (depending on its sign). This process establishes temporal constraints on the parameter range of the excitation pattern. In other words, every event starts from zero energy and builds up at an ecologically-bound rate, until the energy input stops. At this point, the damping process kicks in reducing the energy level until zero is reached. Three dynamic evolutions are possible: (1) excitation, when \( a \) is positive, (2) equilibrium, when \( a \) is zero, and (3) damping, when \( a \) is negative. The excitation process shapes attack dynamics of the event. The state of equilibrium corresponds to a sustained energy input compensated by approximately equal energy dissipation. The damping process defines decay characteristics of the event. By means of a single control parameter, this algorithmic structure generates ecologically-constrained meso-patterns. As in real-world situations, sound events change state relatively slowly and decay gracefully.

The sound event's global spectral profile is defined at the microlevel by the types of samples employed in the synthesis engine. Homogeneous events are obtained by using a single class of granular material, e.g., water drops. Heterogeneous ones are synthesized by means of class mixture or hybridization, or by applying transformational processes to the collected samples (Keller, 2000). The spectral profile can also be determined by the manipulation of resonance parameters. Spectral characteristics can be molded by means of string, pipe and other types of resonators or by controlling the phase-synchronicity among granular streams. Attenuation processes define how energy is dissipated. Through damping coefficients, these processes control the distribution of grains and the decay rate of spectral components (Keller and Berger, 2001).
Sound placement

Three factors establish the spatial cues: (1) local reverberation, implemented by convolving the granular samples with various impulse responses, (2) phase-controlled granular processes in which the phase offset and the amplitude scaling provide cues akin to early reflections or sonic ‘volume’ (Truax, 1992), and (3) localization, or source placement within the multichannel field, implemented by means of amplitude panning and loudspeaker-dependent delays (Lopez-Lezcano, 2001). Furthermore, the dynamic manipulation of location provides directional cues for source movement and diffuseness, or the event’s spatial spread.

An illustrative example of the relationship between spatial cues and synthesis methods is given by the piece IQ² (Keller and Knox, 2000). This video and sound installation was presented at the Iron Works Gallery in Vancouver during September 2000. The sonic material consisted of two layers of events exploring hybrids of water drops and metallic impulses. One layer was constantly present and furnished an artificial acoustic space that took advantage of the reflective properties of the gallery. The sounds in this layer were created through the convolution of reverberant water drops and impacts on metallic surfaces. Sounds were laid out on two tracks routed independently to two sets of speakers. These speakers were placed on the floor pointing to the ceiling. Wall and ceiling reflections reinforced the reverberant characteristics of the soundtrack. Another layer was diffused through a group of four speakers hanging from the ceiling. This layer featured several types of events synthesized along a continuum that went from harsh metallic impulses to smooth water stream sounds. The events were activated by five motion sensors placed on the walls of the room. The number and behavior of the spectators determined what classes of events were triggered.

Sound classes

The sound class is a powerful compositional tool. Ecologically-based composition explores the various forms of transformation within a single class, utilizing variations in density and localization. This technique enables the creation of long-breath works with a restricted collection of sound material (Keller, 1999b). Processes of hybridization among classes can be investigated along the temporal, spectral and spatial domains by fusing the characteristics of two or more different classes. As a complement to the utilization of sonic fields, sound classes can establish conceptual links among sounds, creating networks of symbolic relationships within the composition.
**Sonic fields**

The relevance of synthesis processes linked to the state of the sound source becomes clear when interactions among multiple sources are considered. Environmental events occur in the context of extremely complex backgrounds. When biological agents are involved, the characteristics of the events are dynamically modified by the action of the agent on the environment and by the state of the environment during the agent-object interaction. A representation which updates its state as new information becomes available allows for environment-dependent manipulation of the event’s characteristics.

As it was defined at the beginning of this section, the sonic field is the space-time distribution of sound events produced by actions constrained by sonic affordances within a spatial and temporal horizon. This horizon is parametrically-determined by the behavior of the listener. In the case of video works, the position of the listener can be related to the position of the camera. The distribution of sound events can explore various configurations in relation to the imagetic material. A consistent sonic field provides enough cues for the listener to determine the position of all sound sources and the acoustical characteristics of the space. Thus, the sonic organization of the material becomes independent from the visual organization and may thus establish dynamic interactions among visual and sonic cues.

**Geography and composition**

The ecological approach proposes that the musical work be understood as a result of the interaction between the composer and the environment (Keller and Capasso, 2000). This interaction takes place within a specific location and within a given time frame. The compositional cycle involves collecting material, selecting and editing sound, extracting sound events and sub-events for the synthesis processes, creating models of the events observed, organizing a sound-space continuum where sound events are distributed, and recontextualizing sonic patterns by means of visual, tactile, olfactory and textual material.

An unsolved issue in soundscape studies is how to present culturally-grounded elements to an audience that does not share the same cultural experiences. Traditional soundscape techniques suffer from the same limitations that are criticized in acousmatic composition: even though sounds are not treated as abstract objects, in practice their content is abstracted from the original cultural and historical paradigm. One way to avoid this conundrum is to apply compositional processes shaped after the historical and geographical context where the sonic material has been gathered. This alternative method raises an obvious question: should we limit our creative work to producing documentaries? The answer is yes and no.
In the sense that the work is situated within a geo-historical frame, it can be said that it is a documentary. Nevertheless, the manipulation of sonic material by means of parametrically-controlled models allows for the extension of the sonic organization to the realm of the imaginary. By reenacting the processes established through a set of geo-historically constrained variables, eco-based composition ensures that the created sonic environments abide by the rules of the observed soundscape.

The possibilities afforded by the interaction of agents and objects within a given space can be further extended through the manipulation of synthesis parameters. In fact, the continuum between actual events - represented by sampled sounds - and abstract sounds - produced by means of synthesis algorithms - can be consistently explored using eco-based tools. An inverse relationship can be observed between the constraints placed upon the parametric manipulation and the recognizability of the sound classes produced. Sampled sound sources can be easily recognized as long as the sounds are kept within their original context (Truax, 1984). Processed sounds can usually be attached to their original sources if the sound's original attack characteristics are preserved. Synthesis algorithms not patterned after real-world events generate sounds that are clearly distinct from real sources, e.g., FM synthesis and other nonlinear techniques (Roads, 1996). The gap between sampled sound classes, which cannot be parametrically modified, and processed sounds, which can easily lose their recognizability due to the arbitrary nature of the parametric manipulation, is filled in by the development of sonic manipulations based on cues extracted from real-world events. Thus, ecologically-based techniques allow for the exploration of sonic transformations without precluding the ability to recognize the sounds produced by the interaction of real-world agents and objects.

**Conclusion**

This section addressed the theoretical groundings for the compositional methodology utilized in *Patiti*. The first part presented several key concepts of an ecological theory of sound: the personal environment, affordances, events, sonic fields and sound classes. The ecological approach places several demands on the sound modeling tasks. In order for the ecologically-based sound models to exhibit behaviors akin to real-world events, the models have to fulfill various requirements. The attributes of these models were discussed in Part 2. The third part explained the compositional usage of ecological modeling and proposed an organizational axis encompassing parametric control, source identity and sonic transformation.

The framework discussed in this section for ecologically-based sound event synthesis encompasses spectral, meso-temporal, and spatial cues. Events are shaped by means of excitation and damping processes that determine the attack and decay characteristics. The excitation-damping scheme facilitates the synthesis of ecologically-constrained sound events by establishing meso-level patterns from a
single parametric control. Through multilevel algorithmic handles, attack transients, decay transients, and sound texture can be controlled in detail.

Ecologically-based techniques provide a consistent framework for the development of compositional strategies. Composing can be equated to the exploration of the sound models’ behaviors within the context of predefined sonic fields. The symbolic content of the work is thus a direct outcome of its geo-historical placement and of the possible perceptual interpretations of the recontextualized materials.
Chapter 4 - The Orellana Expedition

“I, Brother Gaspar de Carvajal, the least of the friars of the order of our brother and friar, Father Saint Dominic, have chosen to take upon myself this little task [to recount] the progress and outcome of our journey and navigation.” (Medina, 1970, 233). These are the final sentences of the extraordinary chronicle describing the first Spanish trip through the waters of the Amazon River. Through a series of snapshots taken from Carvajal’s chronicle, I will follow the journey of Francisco de Orellana and the fifty-nine men that accompanied him. The objective of this section will be to witness from first-hand sources the dynamic of the interactions between the conquistadores and the local populations of the Amazon Rainforest.

El Dorado

The search for a land of unending richness was an obsession throughout the Spanish conquest of the Indies (Gil, 1989; Ramos Perez, 1973). Hundreds of expeditions were organized to the farthest realms of the continent, comprehending a time span of several centuries. In 1531, Diego de Ordás followed the Orinoco River upstream. Three independent expeditions, Benalcázar’s (1534-1538), Quesada’s (1536-1538) and Federman’s (1536-1539) coincidently reached the highlands of Bogotá, Colombia (Jós, 1927). Spurred by the aboriginals’ reports, it was soon believed that these highlands hid a sacred lagoon filled with gold statuettes, offerings to the gods. The lagoon of Guatavita was drained by excavating a huge cut on one of its sides (Jós, 1927). Nevertheless, this engineering feat did not yield any precious findings to the Spaniards.

The retellings of the expeditionaries, the rumors fostered by the aboriginals, and the actual findings of wealth were among the elements that coalesced to shape the legend of El Dorado. The legend was infused by the existence of a rich and powerful kingdom, a lake where gold offerings were thrown, and an Indian chief that ornamented himself with gold powder. Castellanos (Elegías, Parte III, Elegía a Benalcázar, Canto II), spoke of a Native king that would bathe in sticky liquor and cover his body with ground gold:

cierto rey que sin vestido
en balsas iba por una piscina
a hacer oblación según el vido
ungido todo bien de trementina
y encima cuantidad de oro molido
desde los bajos pies hasta la frente
como rayo del sol resplandeciente.
A careful perusal of the first chronicles unveils that the myth of El Dorado did not take form until the return of the Amazon expeditionaries in 1542 (Ramos Perez, 1973). When Gonzalo Pizarro departed from Quito, the objective of his journey was to find the “land of cinnamon” (Carvajal, 1542, 102). His unfruitful excursion ended back in Quito but the unexpected offspring of the trip was the ‘discovery’ of the land of the Omagua and of the largest river in the world. These facts reached the ear of the historian Oviedo who was on Margarita Island at the time of the conclusion of the accidental journey through the subsequently named Amazon River (De Oviedo, 1959). The descriptions furnished by the chroniclers plus the myths fostered by the rich imagination of the conquistadores provided enough material to shape a legend that served as the strongest motivation for several unwieldy incursions to the most dangerous places in the continent. Thus, it may be concluded that the one event that triggered the frenetic search for the land of El Dorado was the Pizarro-Orellana expedition to the land of cinnamon.

**Pizarro**

In 1541, after a ten-month journey through the land of the Quijo, Gonzalo Pizarro and his 244 Spanish soldiers reached the Coca River at approximately 120 km upstream from its confluence with the Napo River (Carvajal, 1542; Jiménez de la Espada, 1894; Jós, 1927; Medina, 1970). The Spaniards established a camp at this site, but the situation was precarious. All the food had been consumed and they found only very small indigenous populations. The objective of the expedition, the cinnamon trees, was frustrated by the scarcity of those trees in the region.

Francisco de Orellana suggested to Pizarro the construction of a brigantine to navigate the river downstream. The plan was to locate the populations nearby and to report back to the camp. Pizarro authorized Orellana to organize the expedition and on December 26, Orellana, fifty-seven soldiers, two friars and some slaves embarked on the vessel with few weapons and almost no supplies.

“Gonzalo Pizarro and his men [had] remained behind waiting for the provisions which Captain Francisco de Orellana was to bring to them: as he did not come back with these, and [as] the hunger was so great, it became absolutely necessary for them to eat up their horses little by little, and eventually there were soldiers in such a condition that they gradually accepted the expedient of bleeding the horses once a week and cooking their blood with herbs in the morions which they wore, and of cooking it in this way along with the herbs and all; and this they did in order that their food supply might not give out so soon; in consequence of which situation it became absolutely necessary for Gonzalo Pizarro to go back to Quito, where he finally came out again at the end of two years.” (Ortiguera, 1581 in Medina, 1970, 320).
Hunger

After leaving Pizarro’s camp site, Orellana’s troupe spent nine days on the brigantine. They had not taken any food with them since none was available at the camp site. The slope of the terrain in this region is pronounced so the average speed of the water is fairly fast. Probably, Orellana’s boat traversed over a hundred kilometers during the first nine days of the trip.

The sufferings caused by the lack of food obliged the men to take desperate measures. “In the meantime, lacking other victuals, we were eating leather from the seats and bow of saddles, and also the leather from the game [or the outside] of the chests or hampers whose coving was made out of it, in which we were transporting the little clothing and bedding that we had, and a few tapir skins, not to mention the soles and [even whole] shoes that could be found among the members of the party; and, though there was no sauce other than hunger itself, this latter created in them a taste [for these things] and such an appetite [for them] that up to the point where we could stand no longer these dishes of a sort so new were tolerated in order that this wretched flesh of ours might be sustained.” (Carvajal, 1542, 408).

All conquest expeditions depended heavily on finding local populations from whom to procure food. Hunger was the conquistadors’ permanent enemy. Their dependence on aboriginals’ food was aggravated by the harsh and alien qualities of the Amazonian jungle. Countless species of plants and fruits are easily available to the traveler, but it takes expert eyes to locate and identify harmless varieties. Carvajal described how several Spaniards suffered serious intoxication from ingesting poisonous herbs.

Possession of the land

On January 3 and 4, 1542, they heard the sounds of drums and eventually reached populated land. After taking advantage of the local’s hospitality, the Spaniards decided to take possession of their benefactors. The scrivener documented their action in the following terms. “On this same day [of] the above-mentioned month and year the said Lieutenant requested me, the said scrivener Francisco de Isásaga, to bear witness for him and furnish him with true testimony to the fact that he in the name of His Majesty, and on behalf of the Governor Gonzalo Pizarro, does take possession, as the latter’s Lieutenant-General, of the people of Aparia and of the people of Irimara and of all the other [peoples represented by the] chiefs who have come to a peaceful understanding [with him]; and to bear witness for him to the fact that they have come to where he is, and have served him and are serving him, and that he has taken the said possession without interference on the part of anyone.” (Medina, 1970, 253).
The initial objective of the group commanded by Orellana was to find food and to return as fast as possible to Pizarro’s camp in order to meet the remaining Spanish forces. At this point, a decision had to be taken regarding their return. Some authors, based on secondary sources and on the judicial questioning that Orellana was subjected to, accused him of treason to the Spanish Crown. Nevertheless, Carvajal is keen to assert that Orellana was determined to go back and was forced to reconsider his plans after the soldiers presented him a letter requesting a change in plans. The arguments sited in support of continuing the journey downstream were: the great distance traversed, the absence of trails to travel by land, the speed of the river which precluded rowing upstream, and the lack of food.

**Weapons**

It is not known how many weapons were carried by the expeditionaries, but it is certain that they were not sufficient to face large numbers of enemies. Carvajal mentions a few archebuses and crossbows. A telltale sign of the importance placed on these few weapons is given by Carvajal’s recount of a funny incident that occurred on May 6. “A certain companion who has already been mentioned, named Mexía, shot with a crossbow at an iguana which was in a tree close to the river, and the nut sprang out of the stock of his crossbow and fell into the river, and a fish swallowed it; and that same afternoon, [the men] feeling that there was no chance of being able to get the nut back, and the whole company, indeed, being greatly grieved because one crossbow thus remained useless, a certain companion cast a hook out into the river and pulled up the very fish which had in its belly the very nut referred to.” (Medina, 1970, 420).

The conquerors’ military superiority is neutralized further by the characteristics of the terrain. It takes expert eyes to see through the forest canopy and local populations were well equipped to receive invaders. A case in point was the encounter with the Tapajó, christened Amazons by the Spaniards. “It must be explained that they are the subjects of, and tributaries to, the Amazons, and, our coming having been made known to them, they went to them to ask for help, and there came as many as ten or twelve of them, for we ourselves saw these women, who were there fighting in front of all the Indian men as women captains, and these latter fought so courageously that the Indian men did not dare turn their backs . . . ” (Medina, 1970, 214). Carvajal’s idealized description of the Amazons is more in accordance to Spanish expectations of what a woman warrior should be, than to the actual looks of the Tapajó women. “These women are very white and tall, and have hair very long and braided and wound about the head, and they are very robust and go about naked, [but] with their privy parts covered, with their bows and arrows in their hands, doing as much fighting as ten Indian men, and indeed there was one woman among these who shot an arrow a span deep into one of the brigantines, and others less deep, so that our brigantines looked like porcupines.” (Medina, 1970, 214).
As it was stated before, the exploratory feats that characterized the first century of the Conquest of the Indies were motivated less by economic reasons - the quest for gold - than by a combination of mysticism, thirst for glory, and the locals’ ability to misguide the conquerors. Orellana’s expedition is a perfect example of the distorted European gaze of an environment as alien as the Amazon jungle. As opposed to other contemporaneous expeditionary forces, Orellana’s troupe was in an extremely delicate situation. Their number was reduced - around sixty men as opposed to the usual several hundreds. Their weapons were limited: a few archebuses, crossbows and the usual swords and knives. They had no horses. And, most problematic, they lacked mobility. Given their ignorance of the terrain and the impossibility to travel across the jungle, they were limited to following the river downstream.

In spite of these constraints, the Spanish acted following their mandate, namely to annex territory for the Crown, to impose their religious beliefs and to flaunt their military might. These objectives, though illustrated by Orellana’s discourse, are best exemplified by the actual Spanish interactions with the local nations throughout the trip. On May 12, they had reached Machiparo land and Orellana put forth this harangue (Medina, 1970, 422-423):

Gentlemen, brothers, friends, and companions of mine: Great confidence have I in God and in His Glorious Mother, and you too will do well to have such, that thanks to the good luck [that regularly attends enterprises carried out in the name] of the Emperor-King our master, our voyage is destined to terminate in a deliverance from destruction; and, in order that this may come true, we must not allow any delays or linger [on the way] but on the contrary pursue our course diligently, since our efforts are directed towards serving our monarch, now that we plainly see that [it was] in [keeping with] his good fortune (though not [through any order issued by him directing us] to come to reconnoiter or explore these hitherto unknown lands, or [to undergo] the hardships past or present or still to be looked forward to) [that] God was keeping you and me in reserve for this trial of our persons, inasmuch as we left Captain Gonzalo Pizarro’s expeditionary force with an entirely different intention, and [that was] to return to him promptly. So it is that God is manifestly showing us that it is His will that we carry out this enterprise of exploration and that we keep on in this voyage...
upon which we are [launched]; and for the sake of the successful
outcome of all this it is necessary that we value highly the life of
every Spaniard in our company. [...] and [I warn you] that, so far
as it shall be within our power to continue to advance on our way
and not have any fighting or recourse to arms, that must be done. [. . . ]
Get ready, gentlemen, because my decision is to leave this
place, and let each one load what food he has into the boats, for we
have as intercessors for us the Mother of Jesus Christ Our Savior
and the glorious Saint James, patron and protector of Spain and the
Spaniards.

The Omagua

The Amazonian tribe that made the strongest impression upon the explorers was the nation of the
Omagua. After Orellana’s expedition, this nation was equated to the mysterious people that dwelt in El
Dorado. To Spanish eyes, the Omagua had several features that distinguished them from other várzea
communities: they flattened their foreheads, they wore colored clothes and they built elaborate temples
to their deities. Similarly to Tapajó and Marajoara cultures, they produced highly refined pottery.
Carvajal’s account of May 23 stresses the quality of Omaguan art: “. . . there was a villa in which there
was a great deal of porcelain ware of various makes, both jars and pitchers, very large, with a capacity
of more than twenty-five arrobas, and other small pieces such as plates and bowls and candelabra of
this porcelain of the best that has ever been seen in the world, for that of Málaga is not its equal,
because it is all glazed and embellished with all colors, and so bright that they astonish, and, more than
this, the drawings and paintings which they make on them are [very] accurately worked out . . . ”
(Medina, 1970, 201).

On June 5, they reached a large Omaguan town. This town featured a remarkable wooden construction
which, according to Carvajal, served for religious purposes. “And on this day we made port in a village
in which there was found, on a public square, in a place of worship dedicated to the Sun, a large hewn
tree trunk ten feet around, carved in relief, and all of one piece, whence the reader will be able to
imagine how large a tree that must have been out of which such a piece was cut. That design which was
[to be seen] on that hewn tree trunk was, as has been stated, carved out in relief, and represented a
round wall tower with two doors, and at each door were two columns, and on the sides of the tower
were two lions with ferocious looks, which turned their glances backwards as though suspicious of each
other. These held between their forepaws and claws the entire structure which was carved there in half
relief, in the middle of which, as an offering to the Sun, they poured chicha, which is the wine which
those people drink, and the Sun is the one whom they worship as their god; this chicha worked its way
down to the bottom of that block of wood and ran out to the ground.” (Medina, 1970, 427).

Caravajal’s description of an Omaguan temple provides some details on the appearance of their idols.
“In this house there were two idols woven out of feathers of diverse sorts, which frightened one, and
they were of the stature of giants, and on their arms, stuck into the fleshy part, they had a pair of disks
resembling candlestick sockets, and they also had the same thing on their calves close to the knees: their
ears were bored through and very large, like those of the Indians of Cuzco, and even larger.” (Medina,
1970, 201).

The roasted Indians

Compared to other contemporaneous documents, Carvajal’s chronicle (1542) stands out for its
thoroughness and objectivity. But in spite of the author’s best intentions, the Eurocentric perspective
permeates the commentaries about the locals’ way of life. As it happens with most writers of the time,
with the exemption of Bartolomé de las Casas, Carvajal stresses the virtues of the Spanish soldiers and
dismisses their misdoings. His text presents a group of men fighting for survival and subjected to unjust
treatments from the Indians.

A cursory look at the actions perpetrated by Orellana’s soldiers unveils good reasons for the locals’
animosity against the Spaniards. Current research on the dynamics of Amazonian cultures shows that
there existed fluid communication among the various groups that dwelt in the várzea. Thus, it would be
likely that the communities under attack upstream would forewarn those living downstream, who would
thus prepare to greet the Spanish visitors accordingly.

Early in the voyage, Orellana ordered the hanging of several Indians so that they would “learn their
lesson.” Another action that stands out for its cruelty took place on June 14. Not without a touch of
irony, the Spaniards christened the town where the crimes were executed as Town of the Burned
(Pueblo de los Quemados). “And, thanks to the skill of the archebusier and following the orders of the
Captain, a large hut was set on fire, in order that the Indians might take fright and in order that with
reduced risk for the Christians a certain quantity of provisions might be seized to enable us to continue
on our journey. And after a few Indians had fortified themselves inside that house, they made up their
minds not to come out, but to put a defense by shooting many arrows from there, and as a result of their
stubbornness they were all burned inside, with a few women and children, not being willing to
surrender or get away from that danger; and for that reason this settlement came to be called [by us]
Making fun of it

Carvajal’s account (1542) offers several examples of how little the Amazonian dwellers regarded the European visitors. The Spaniards must have been quite a sight, dressed up in rags, dirty, with odd beards, and drifting on an awkward boat. “At the same moment there came out many armed with [bows and] arrows from among the trees along the shore of the river, talking very loud and as if vexed, going through all sorts of contortions with their bodies, indicating thereby that they looked upon us with scorn.” (Medina, 1970, 433).

In the case of the Tapajó, the usual exchange of trinkets for gold failed. On June 25, the Spaniards tried to establish contact with a community and to obtain food from them, but their offer was valued as much as it was worth. “The gourd had been thrown into the water in the direction where the Indians were in order that they might see it, while we were holding off at a short distance a canoe came up to the gourd containing the chaquira, and they picked it up and showed it to the other Indians, and they valued it so little that it became evident to us that they were making fun of it.” (Medina, 1970, 436).

Pororoca

As the expeditionaries approached the mouth of the Amazon River, it became clear that they should prepare to face open sea navigation. On August 6, they stopped at one of the hundreds of islands of the Amazon River delta. “There in that little camp, nails were made for use in repairing both brigantines and in putting decks and upperworks upon them, for they had none, with the idea of getting them ready and [converting them into vessels] of such a sort that they might be fit to go to sea.” (Medina, 1970, 443). Besides priming their improvised vessels to face the open sea, they stopped to secure fresh water and food to be able to spend several days without touching land. “. . . At the mouth of the river through which we came out, [. . .] we took on water, each one a jarful, and some half an almud of roasted maize and others less, and others [supplied themselves] with roots, and in this manner we got ready to navigate by sea wherever fortune might guide us and cast us, because we had no pilot, nor compass, nor navigators’ chart of any sort, and we did not even know in what direction or toward what point we ought to head.” (Medina, 1970, 232).

Twice a year the high sea tides combine with the strength of the fluvial waters to create a unique phenomenon called pororoca. The pororoca consists of strong waves that originate at the mouth of the Amazon and traverse the river upstream for approximately thirty kilometers. Orellana and his men had the misfortune of reaching the Marajoara region at the time of the pororoca. The small brigantines almost collapsed under the action of the waves and were frequently pushed back upstream. “From here on we proceeded under sail, watching the tide, tacking from one side to the other, for there was a very
considerable tide when one took into consideration the fact that it was at a place where the river was wide, although we were passing among islands; to be sure, we were in no small danger whenever we expected the tide; but as we had no [anchors], we would fasten to stones. We kept steering our course through places where the water was shallow enough to allow us to make use of our anchors, and we held on so poorly that it happened to us very frequently to drag our [stone] anchors along the bottom and go back upstream in one hour a greater distance than we had covered during the whole day.” (Medina, 1970, 231).

**Summary**

On September 11, 1541, the *Victoria*, the brigantine that carried friar Carvajal arrived at Cubagua Island, present-day Venezuela. Carvajal reports that only forty-three of the sixty original Spaniards and two Negro slaves survived. This journey continues to be a feat even by current standards. As it will become apparent in the report of the Keller-Capasso expedition, common means of transportation are not available at some sections of the Napo waterway and fluvial transportation in the Amazon River is still slow and difficult.

Carvajal concludes his account by praising the local population’s highly organized division of labor and the quality of their art. “All the tribes that there are along this river down which we have passed, as we have said, are people of great intelligence and [are] skillful men, according to what we saw and to what they appeared to be from all the tasks which they perform, not only in carving but also in drawing and in painting in all colors, very bright, such that it is a marvelous thing to see.” (Medina, 1970, 233).

The legacy of the search for El Dorado continues to resurface under different forms until the present day (Vila Riquelme, 2001). Kingdoms of enormous riches, such as the Inca and Aztec empires, were destroyed under the conquest. The treasures found were not limited to precious metals and stones, but were largely constituted by all forms of natural resources. Undoubtedly, the greatest source of wealth exploited by the colonizers has been the natural treasures of the land. Nowadays, companies use inexpensive methods to extract oil at the Upper Napo region causing death to flora and fauna, and bringing misery and sickness to the remaining aboriginal communities. The ancestral lands of surviving tribes is under constant threat by new *colonos* and foreign companies.
From December 2002 through February 2003, videoartist Ariadna Capasso and I traversed the route of the first Spanish expedition to reach the Atlantic Ocean from the western part of South America. Our journey began in Quito, Ecuador. We went by ground transportation to the town of Coca and followed the course of the Napo and Amazon Rivers. The objective of our trip was to document the current social and environmental conditions along the path taken by Francisco de Orellana in 1541. Loaded with video and sound recording equipment, and true to the original expedition, we used only water means of transportation (with the exception of the Quito-Coca stretch). For this expedition, we did not make nails, gather wood or build our own brigantines. By the time we arrived in Iquitos, Peru, Ariadna had to return. I completed the journey by myself reaching the mouth of the greatest river in the world on February 3, 2003.

Quito

On December 15, I flew to Ecuador from Buenos Aires. I spent the first four days scouting the historic sites and planning our journey through the Napo Region. Ariadna arrived in Quito on December 21. Soon after the arrival of the Spaniards to America, Quito became one of the epicenters of the Spanish King’s reign in the new continent. The city’s downtown still preserves its original plan and many of the building date back to Colonial times. Whilst in Quito, we filmed several key historical sites, such as Casa de Benalcázár, Iglesia de la Compañía de Jesús, Catedral de San Francisco de Quito, among others.

We also visited Guápulo, a small village located on the western slope of the mountains surrounding Quito. This used to be a separate town, but is now engulfed by the city. It is the site where Gonzalo Pizarro’s expedition, followed a few weeks later by Captain Orellana, departed in search of the cinnamon trees. Two statues of the Spanish captain have been erected here: one on the highlands, the other one within Guápulo proper. During a one-day session we filmed the beginning of the descending path, different scenes of Guápulo and close-ups of both statues. This material is prominently featured in the chapter entitled Sisyphus. The pervasive presence of city noise precluded any high-quality sound recording.

The interesting detail we noticed was that Orellana’s appearance improved proportionally to the placement of the monuments: the higher, the better. It is well known that by the time he started the expedition to the land of cinnamon, Orellana had lost one eye (Carvajal, 1542). The monument located within Guápulo is true to the historical records and presents a Spanish soldier with a parched eye. To our surprise, Orellana’s eye was miraculously restored on the bust situated on the highlands.
Our stay in Quito was extended for two weeks because of problems with customs and the delayed delivery by Federal Express of a microphone adaptor for the Canon GL2 camera. To make efficient use of the time, we made a trip to the Napo Region to gather material and information on the first part of the route taken by Orellana and his men.

The Upper Napo

The landscape changes dramatically along the Quito-Coca road, which witnesses the transition of the Andes mountain and the lowland Ecuadorian montaña into the jungle proper. This region is highly militarized, its main economic activity being oil extraction. Although the distance is not large, given the road conditions and the frequent stops, the bus takes the entire night to reach Coca. We were halted three times at different military outposts. Everybody was made to get off the bus, form a line, and - one by one - empty the contents of their bags. I felt just like if I were at the JFK airport. After a sleepless night, we finally arrived in Coca the following morning.

Coca is a small town located at the junction of the Napo and Coca Rivers. It is the last settlement on the Napo riverside accessible by ground transportation. After finding a place to spend the night, we hired a local guide to take us to the natural reserve of Laguna Verde. The reserve is approximately thirty kilometers from Coca and features a beautiful secluded pond and several waterways. There, we were able to make extensive video and stereo sound recordings.

Following the Napo River downstream, there are two small villages close to Coca. At an hour-long journey is Añangu and at about two hours is Pañacocha. We visited a Quichua community nearby Pañacocha and made recordings within the reserve of Pagualicocha Lake. Located at an hour-long trip from the Napo riverside, the Pagualicocha Lake features a pristine soundscape. Don Guillermo and Doña Dolores, the community leaders, take good care of their land, keeping the region from depredatory hunting and wood extraction and planting fruit trees to attract wildlife. During a long evening chat with Doña Dolores, she related how they have been fighting to safeguard the land from the invasions of the ‘town people’, and how monkeys and other animals have been driven away by the irresponsibility of the white man (Figure 5).
Figure 5. Doña Dolores, a Quichua community leader.

After spending a couple of nights at Añangu, we headed back to Coca to take the bus to Quito. December 30 was the date set by Federal Express for the arrival of the microphone adaptor. In spite of repeated requests, we would not obtain the needed item until the third of January. It is hard to describe our frustration when we learned that the adaptor had been in Quito for an entire week and that we did not receive it sooner because of the ineptitude and mischievous attitude of the Federal Express employees!

We took the bus back to the Napo Region and after a good night’s sleep in Coca, on January 4 we embarked for Nuevo Rocafuerte, at the Ecuador-Peru frontier. On a medium-sized motorboat, the journey took the whole day. Halfway along the trip, we were surprised by a tropical storm. More than once we were obliged to get into the water to pull the motorboat out of the sand banks. Several images of Vivir sin después document the incidents we encountered before reaching our destination.

Nuevo Rocafuerte is a small town, a couple of kilometers away from the border with Peru. During our stay, the main generator was not working so electricity was limited to the few houses that had their own power generator. We were the only guests in the town hotel. The so-called ‘hotel’ had neither running water nor electric light. What our room did not lack were cockroaches. They visited Ariadna’s and my
bed during the night, making all sort of noise. Despite their entomological interest, the lack of sleep prevented us from recording them. Perhaps next time . . .

**The Lower Napo**

Throughout its upper region, the Napo River is characterized by its shallowness and by its numerous sand banks. Large vessels are barely able to follow its course above the town of Santa Clotilde. Only two commercial ships cover the stretch between ‘Santa’ and Angoteros. Particularly during the dry season, navigating the Napo is a tough task that requires expertise and a detailed knowledge of the river’s topography.

When we arrived in Rocafuerte, our worst premonitions were confirmed: there was no transportation to continue our journey down the river. During our stay in Coca we had met two Peruvian oil workers who spent part of the year in Ecuador. They proved to be the sole source of reliable information on what we could expect as we traveled down the Napo. As far as they knew, we would not encounter problems to get from Angoteros to Iquitos, but the stretch between Rocafuerte and Angoteros would have to be covered by hiring private *peque-peques*, the locals’ minute motorboats.

In spite of the intensive oil extraction activities taking place in this region, gasoline is both very expensive and scarce. Since Ecuador adopted the U.S. dollar as its currency, prices have increased significantly. After spending two weeks in Ecuador, we were running on a tight budget and could not afford to pay a few hundred bucks to every canoe owner along the Napo. Furthermore, Ariadna had only ten days to return to Quito. And we could not wait indefinitely for someone traveling down the river to give us a lift. Everything seemed to indicate that our expedition was coming to an end.

Inspired by the initiative shown by Orellana when he started his journey down the Coca River, Ariadna and I decided to take the last chance. We would cross the frontier into Peru and get information from first-hand sources. If there was no affordable way to get to Angoteros, we would head back to Quito while Ariadna still had time to catch the plane. Subsequently, I would take the ground route through the Andes toward Yurimaguas in Peru. But we would not give up before exhausting all alternatives.

The Rocafuerte school teacher offered to take us to Pantoja, the closest Peruvian village. We boarded a thin and unstable canoe with several thousand-dollar worth of equipment in our backpacks and prepared to face the most dangerous strip since leaving Coca. As seen from the river, the jungle in this region is particularly thick and ominous. Behind the huge trees, we knew that the last remnants of the brave Huaorani, the Tagaeri, were keeping a watchful eye. The Tagaeri are feared by all the dwellers in this region of the Napo. Few people enter their land and come out alive.
Soon we learned that our helmsman was certainly not a navigation instructor. We rammed into more than one sand bank and almost capsized several times. The depth of the river did not present any danger to our lives, but it would have been a question of seconds for the small canoe to fill up with water. After a one and a half hour adrenaline rush we finally made it to Pantoja. Relieved, we jumped on firm land and walked around the small village in search of means to reach Angoteros. The news was no good. The only commercial vessel that reached this part of the river, La Torres-Causano, had recently left Pantoja and would only return in two weeks. As we had suspected, the locals that had motorboats charged outrageous sums to take us to our destiny. To make things worse, we had no certainty that we would be able to continue our journey within a reasonable time span upon reaching Angoteros. Ariadna looked at me, I looked at Ariadna, and with an immense sadness in our hearts we slowly headed back to our waiting makeshift captain to set off back to Coca.

The moment we were replacing our baggage on the brittle motorboat, a man with strong indigenous features approached us. After introducing himself by an extremely long and unrepeatable name, of which we managed to catch only ‘Don Roger,’ he offered to take us to Angoteros for an affordable sum and suggested spending the night at his home in Vencedores. Within the blink of an eye, we were on his peque-peque, a carved tree trunk, ready to happily face the dangers of the Napo.

**The Quijo**

The present-day indigenous population along the Napo River is predominantly Quichua, probably descendant of the Canelo. The Canelo were formed through the aggregation of various groups coming from the higher lands (ceja de montaña). An important component of this new ethnic group were the Quijo (Landázuri, 1989). According to Oberem (1980, 21-22), the Quijo dominated the region comprehended between the Coca and the Napo rivers to the East, and the Cosanga River to the West. The Quijo presented a brave resistance to the Spanish invaders. In 1578, the pendedes, or leaders, of the regions of Sumaco, Avila and Archidona organized a joint campaign and defeated the Spaniards in Avila and Archidona (Landázuri, 1989, 19). Their permanent contact with the conquistadors brought disastrous consequences to this nation. Their population was estimated in twenty-seven thousand in 1540. This number had dropped to twelve thousand by 1608 and by the mid-eighteen-hundreds only two thousand remained (Oberem, 1980). The reasons behind their demise were the system of encomienda, instituted by the Spaniards whereupon local populations were placed under forced labor, and the various epidemics that greatly affected the Amazonian communities.
Angoteros

After spending the night at Don Roger’s house in Vencedores, we boarded the peque-peque to continue our journey down the Napo. The morning was sunny so we roasted helplessly on the small canoe. By midday, a few clouds came to our rescue. Our happiness was soon obscured by the menacingly dark sky. Strong winds pushed the waves into the canoe and a torrential tropical storm collapsed on us. Don Roger kept his unperturbed hand at the helm and guided us safely to Angoteros before the day’s end. We were soaked, but thankful.

No batteries

From the moment we left Coca, recharging the batteries became an issue. While staying in Añangu, we paid five dollars for plugging the Canon charger to a power source for a few hours. At Nuevo Rocafuerte we left the Sony camera at the local tavern to be charged. After crossing the frontier, four days passed before we reached a place where we had access to electricity: La Camila. This ship was equipped with a generator that was turned on a few hours each night.

We had three batteries for the Canon GL2, totaling seven hours, and two batteries for the Sony TRV530, worth eleven hours of recording time. In practice, the use of the LCD display and the fact that the camera was often switched on and off reduced the available time by one third. In spite of these limitations, we managed to obtain four-channel recordings at Vencedores and Santa Clotilde in the Lower Napo Region. Noise from motors at Nuevo Rocafuerte and at Angoteros prevented us from doing night recordings. On the other hand, we were able to gather video material at all daytime stops.

No food

Angoteros’s tourist infrastructure is not particularly developed: after a quick inspection of the village we noticed that there was nowhere for us to shower, eat or sleep. The families were gone to the fields and communication with the people we encountered was difficult, to say the least. All information on transportation was uncertain. In other words, we were stranded without food or roof and with no perspective of ever being able to leave the town.

After much insistence, we located a makeshift store that sold water. The young owner spoke some Spanish. She consented to let us sleep under the roof in front of the store and lent us a couple of sheets
to lie on. We ate the dried fruits we had brought with us and right after sunset we were sleeping. The moment we opened our eyes the next morning, a cloud of green flies was furiously attacking us. They stuck to our clothes and hair and left green stains everywhere. We immediately ran out of the place and were homeless once again.

Finding something to eat was no easy task. A Peruvian man I met later in the trip explained to me that Quichua communities are highly dependent on the seasonal production of the land. During the dry season they seed and gather products such as manioc and maize (Meggers, 1996). Since they have lost the ability to store the harvest in pits as their ancestors used to do, during the rainy season food is extremely scarce. None of the houses we visited at Angoteros had meat, fish, or vegetables to sell. By the time we thought we would simply starve to death, a woman offered to fry two eggs and some plantains for us. Eggs and plantains, this would be the exclusive menu we would enjoy during the following week.

La Camila

Until January 7, when we boarded La Camila, we had no certainty that we could reach Iquitos through the Napo River route. Ariadna had a ticket Quito-New York for January 15, which she could not afford to lose. After days of anxious wait in Angoteros, we could not believe our eyes when we saw the old, huge, blue ship slowly making its way up the river.

La Camila is what the locals call a ‘commercial’ ship. Captain Carlos and his family run the small business of transporting goods from Iquitos and trading them for local products grown along the Napo. Some of the typical items are soap, matches, and candles, but by far the most sought after is sugar-cane alcohol, the local whisky. Every half an hour or so, La Camila would stop at a riverside house or community and the exchange would take place. Hundreds of bananas would be brought into the ship in return for a few bottles of aguardiente.

We found a convenient place on the upper deck of La Camila. A roof protected us from the rain, we had a sheet to sleep on, and the bathrooms and showers were nearby. The first days of the trip were quite pleasurable. Most of the material that makes up Sisyphus comes from our observations during these days.

The ship slowly filled up. Thousands of bananas, dozens of pigs and even cattle were brought on board. After stopping in Santa Clotilde, the capital of the Loreto region, the place could be positively termed crowded. During the last days of the trip, we had to share our precious spot on the deck with chickens and dogs, who visited us periodically. The bathroom sink was obstructed and dirty water spilled all
over. At least we knew that our food supply would last, as long as we kept our plantain diet. Against all odds, we arrived in Iquitos on January 12, Ariadna headed back to New York via Quito and I began making preparations for a new jungle expedition.

The Upper Amazon

After Ariadna’s departure, I packed all the equipment in my backpack and took a four-day trip to a camp on Yanayacu River. This backwater river is located about three hours upstream from Iquitos, close to the confluence of the Ucayali and the Marañón rivers (this is the official beginning of the Amazon River). At Yanayacu, I filmed various animals, such as the jergón - the most poisonous snake in the Amazon - the big yellow-blue parrots, king hawks and crocodiles.

The Yanayacu campsite is placed between the swamps and the navigable section of the river. Access to the jungle is done by canoe or through a trail that follows the river upstream. Every morning, I would take this trail to find a good location for the four-channel recording session, away from the noises of the campsite. On my second day in Yanayacu, I was confidently following the path through the jungle when I felt something soft under my rubber boot. I looked down and realized I had stepped on a snake! Without thinking it twice I started running in the opposite direction. Out of breath, I got back to the campsite and asked our guide, Juan Carlos, how poisonous a green snake with white spots was. He said: “Relax man, that’s just a ‘boa’. They are harmless.”

San Joaquín de Omaguas

To return to Iquitos we went by motorboat to San Joaquín de Omaguas - a 300-year-old village on the North side of the river. San Joaquín was a mission that gathered most of the Omaguan population during the eighteen hundreds. The Omagua dominated trade networks along the Napo, Coca, and Upper Amazon rivers throughout the sixteenth century. Their multivillage chiefdoms were characterized by social stratification and intensive agricultural production. They cultivated bitter manioc, maize, chonta palm and cotton. They also kept large stores of dried fish and meat (Rival, 2002).

The Omagua maintained large areas of no-man's land around their territory. Omagua settlements were built around temples dedicated to the sun. The Omagua brought offerings of cloth and precious stones to these temples, which were covered with feathers of all colors and contained idols. Captured enemies were kept as servants within house groups or were traded. Carvajal (1542) notes that they treated their slaves just like any other member of their community.
The Omagua controlled the trade along the Upper Amazon Region, serving as intermediaries between the Spanish missions and the local indigenous groups. By the end of the sixteenth century, the Omagua were persecuted by the Spanish colonists, they were being enslaved and thus were forced to abandon their village societies based on agriculture and ritual. They fled from the river banks and settled in the interfluvial zone between the rivers Napo and Coca and along the Tiputini. They occupied this region until 1680 (Rival, 2002). By the eighteenth century their population had drastically dropped. In 1958, Girard reports the presence of a small Omaguan community, but we could not determine the location of this community anywhere in the Napo Region. Nowadays, San Joaquín de Omagua is a typical mestizo town without traces of its cultural origins.

We had lunch at San Joaquín and prepared ourselves for a three-hour hike through the forest. The first kilometers of the path are pronouncedly uphill. The encounter of the Ucayali and the Marañón can be seen at a distance. The locals’ walking pace can be compared to jogging: stopping to recover the breath is out of the question. Thus, after a couple of hours I was starting to feel the weight of my twenty-kilo backpack. Juan Carlos and I took turns to carry the equipment. The afternoon rain had filled the path with puddles and mud. So all of us, including the experienced guide, took at least one fall. Muddy and tired, we finally made it to the Nauta-Iquitos highway.

Once in Iquitos, I took another cargo ship to Tabatinga - close to the Colombia-Peru-Brazil frontier. The *Manuel* took two days to reach its destiny. The day after arriving from Iquitos, I boarded the *Elizabeth II* heading toward Manaus. This stretch lasted four days. I spent one Saturday in Manaus, visiting historic sites and documenting the urban pollution of this industrial city. On Sunday an opportunity presented itself to embark on my last expedition to the jungle.

**The Negro River**

Carvajal and the Spanish expeditionaries were very impressed when they reached the encounter of the black waters of the Negro River with the brown waters of the Amazon. For several kilometers both rivers run side by side without mixing. The riverside of the Negro Region features white sand beaches and highly acid soil. Under the light of the sunset, the black water, the white sand and the dark green of the forest give the impression of an alien world. The beauty of the scenery stands in stark contrast with the difficult life of the local inhabitants. Agriculture has rendered the land improductive and the effect of fire can be seen at many locations along the river coast.

I spent five days filming different sites along the Negro River within the Cuieras Reserve. This reserve is located four hours upstream from Manaus. This region is more densely populated than the Upper Amazon so it is much harder to get away from motor noises. During my excursions away from the
riverside, I managed to get several four-channel recordings. The only frustrating aspect was the difficulty to record the mysterious howling monkeys. Even though I spent several nights awake, their unpredictability prevailed.

The Tapajó

After returning from Cuieras, I took a fast motorboat from Manaus to Santarém. This boat traverses the Manaus-Santarém stretch in thirteen hours instead of the three days used by the regular cargo boat. I spent one day in Santarém filming the encounter of the green waters of the Tapajós River with the brown waters of the Amazon. This is the location of the legendary Tapajó Nation (Palmatary, 1960).

According to Meggers (1996), the capital of the Tapajó, located at the mouth of the Tapajós river, was estimated to furnish 60,000 warriors. A typical village contained between twenty and thirty houses. The principal crop was the maize which they stored in baskets buried in ashes. Carvajal (1542) mentions the quality of their bread which was made with a mix of maize and manioc flour. Wild rice was collected to make wine. The Tapajós River did not provide much fish, so fishing was done at the várzea. Their diet also included turtles, manatees and forest game like the tapir.

The Tapajó were greatly feared by neighboring tribes and maintained supremacy over them by virtue of their large numbers and readiness to do battle (Meggers, 1996). Their main weapon was the bow and the arrow with the poisoned tip. As I already mentioned, both men and women were warriors.

Belém

The morning following my arrival in Santarém, I boarded the Rodrigues Alves cargo ship to Belém. The Rodrigues Alves took three days to reach the last city of the journey. The ship crossed through the channels formed by the hundreds of islands that form the delta of the Amazon. Not surprisingly, when the Spanish expeditionaries crossed this section of the river, they could not determine where the actual margin of the river was. The last part of the trip featured several good views of the mouth of the Amazon River as it mixes its waters with the Atlantic Ocean. On February 3, after passing the large island of Marajó, the unreal view of tall buildings in the middle of the jungle told me that I had reached my final destination: Belém.

My journey through Orellana’s route concluded on February 7. I had been traveling for more than two months, spending about three weeks on the river to complete a trajectory of over five-thousand
kilometers. At many moments the journey was virtually obstructed by the lack of means of transportation. Ariadna and I had access to locations where electricity, current technologies and the consumption of industrial goods are inexistent. This experience gave us the real dimension of the exploratory feat done by the group of Spanish men in 1541. More important, we could see and feel the living conditions of some of the communities that struggle for the preservation of their source of subsistence: the fragile ecosystem of the várzea.

Summary

Throughout this chapter I described the process of gathering material for the piece Paititi: a multimodal journey to El Dorado. This process is a key aspect of the compositional methodology proposed in this work, namely reenacting the thematic situation of the piece. The in-situ study of the locations visited by Orellana’s expeditionary force provided the full geographical dimension of the 1541 expedition and pointed to the impact of twentieth-century technologies on the local soundscape. The perspective gained through the trip suggested a reevaluation of the objectives of the initial proposal, emphasizing the current social and environmental conditions of the Amazonian várzea.
Chapter 6 - Paititi: The Installation

This section discusses the content of the installation *Paititi: A Multimodal Journey to El Dorado*. The format of the piece is an installation space combining video, still digital images, and multichannel sound. The composition was created by means of digital sound processing and synthesis of environmental sounds modeled after the collected material. The visual material includes original footage taken along the Napo-Amazon route and media documentary shots. The sonic material features on-site recordings of people and animals of the region. The literary material encompasses documents written by the conquistadores, written reports by aboriginals and original prose inspired on historical events and oral tradition (César, 2001).

**Compositional processes**

As it was explained in the second chapter of this thesis, *Paititi* was composed applying ecologically-based techniques to the collection, editing, transformation and organization of the audiovisual material. The acquisition of images and sounds was done through the reenactment of the journey along the Napo-Amazon waterways. The processing of the video footage was aimed at obtaining multiple perspectives of single scenes. Accumulation and modularity were utilized to generate and organize the sonic data. Sounds were distributed as sonic fields extending the spatial and temporal characteristics of the recorded sound material.

**The material collected**

Among the results of the project *Paititi: A Multimodal Journey to El Dorado* is a collection of more than fifty hours of sounds and images, including mono, stereo and four channel recordings, video and digital stills. The material gathered is quite unique because of the isolated places visited and the large territorial extension covered.

The recordings obtained encompass video and still images, stereo and quadrephonic sounds. Thirty-five *Digital-8* tapes and thirty *Mini-DV* tapes make up a total of sixty-five hours of raw material. All quadrephonic recordings were done on locations devoid of urban sounds: Vencedores (Napo River), Santa Clotilde (Napo River), Yanayacu (Upper Amazon River), Cuieras (Negro River). Video material was collected in urban centers such as Quito and Guápulo (Ecuador), Iquitos (Peru), Manaus and Belém (Brazil). Close-ups of unapproachable forest animals were filmed at the *Museu Paraense Emílio Goeldi* in Belém.
Images

The visual material utilized in Paititi includes footage obtained at the Amazon Basin and shots extracted from media war news (Table 1). The video is divided into several segments or scenes. Each scene is self-contained, standing as a meaningful independent idea. Both visual and sonic materials are recontextualized within each scene. Scenes are grouped in chapters, offering various perspectives on a single theme. In its first version, Paititi is composed of five chapters. The chapters are grouped around several thematic axes: native-Spaniard interaction, legends, rituals, landmarks, and present-day parallels. The open-form compositional approach permits the permanent development of the work without compromising its formal unity.

Table 1. The visual elements of Paititi and the locations where footage was obtained.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Visual element</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>To morrow</td>
<td>Oars</td>
<td>Laguna Verde</td>
</tr>
<tr>
<td></td>
<td>Woman washing a pot</td>
<td>Pagualicocha Lake</td>
</tr>
<tr>
<td>Sisyphus</td>
<td>Baroque cross</td>
<td>Quito</td>
</tr>
<tr>
<td></td>
<td>Orellana statue</td>
<td>Guápulo</td>
</tr>
<tr>
<td></td>
<td>Bananas</td>
<td>La Camila</td>
</tr>
<tr>
<td>Endings (water)</td>
<td>Oars</td>
<td>Laguna Verde</td>
</tr>
<tr>
<td></td>
<td>Canoe</td>
<td>Laguna Verde</td>
</tr>
<tr>
<td>Endings (fire)</td>
<td>Kids’ raft</td>
<td>Coca</td>
</tr>
<tr>
<td>To day</td>
<td>Storm</td>
<td>Upper Napo</td>
</tr>
</tbody>
</table>

Sonic fields

Carvajal's chronicle (1542) includes descriptions of several sounds he heard throughout his voyage. These sounds were produced either by instruments or by animals. The descriptions are complemented with details on the appearance of animals, plants, and topography. Thus, his chronicle constitutes the first resource for data on the sonic material encountered in the journey. The exploration of remote sites along the Napo and Amazon courses provided recordings of birds, insects and complete two-dimensional environments at various times of the day. These recordings were used as a mold for the development of sonic fields which serve as the compositional basis of Paititi.
The spatial, spectral and temporal transformations among sonic classes are a distinct feature of eco-based techniques. In Paititi, these types of transformation are applied on the synthetic and the recorded sonic classes. Table 2 presents a list of the timbral classes utilized in each section of Paititi. First, grains are extracted from the sampled sonic environments. Patterns of spatial and temporal distribution are applied on the pool of grains. Finally, the resulting events are organized within a coherent sonic field. This sonic field is structured to establish various forms of relationship among the visual and sonic cues.

Table 2. The sonic classes utilized in Paititi.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Sonic Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>To day</td>
<td>storm, rain, ax, voices</td>
</tr>
<tr>
<td>Sisyphus</td>
<td>pigs, metal, voices</td>
</tr>
<tr>
<td>Endings (fire)</td>
<td>swords, explosions, night rainforest, metal</td>
</tr>
<tr>
<td>Endings (water)</td>
<td>oars, storm, explosions</td>
</tr>
<tr>
<td>To morrow</td>
<td>morning rainforest, oars</td>
</tr>
</tbody>
</table>

The spatial layout

Some of the key aspects of pre-Columbian cultures and myths are temporal circularity or recurrence, duality and complementarity, and mimesis (Girard, 1958; Lumbreras, 1993). These views have guided the spatial layout of the visual elements within the installation space. The Paititi space is delimited by white scrim delineating a circular space (Figure 6). Two video channels are projected onto the scrim walls. Both are edited to the same soundtrack and show different but complementary scenes simultaneously. As the visitor enters the darkened space, the projections on the curved surfaces create a sense of distorted dimensions. This parallels the unknown faced by both the local inhabitants in the spiritual realm, and for the Spaniards in the natural realm.
Chapters (Spanish, Portuguese, English)

The following five sections present summaries of the ideas addressed in each chapter of Paititi. Being an open-form work, these chapters are a subset (or superset) of the possible configurations of the piece. Each chapter is an independent work that can be presented as a single-channel video with multichannel sound. During 2004, parts of Paititi have been publicly exhibited both as video screenings and multimedia installations (Keller and Capasso, 2004). Various impressions and comments of the public and critics are provided to complete the discussion of the work.

Vivir sin después / É hoje / To day

In To day the element of water provides the conceptual axis. The threat of the storm that has made the boat seek refuge on shore. Instead of being afraid, the curious nature of children incites them to play. This play becomes a ritual to explain the reality around them and to search for normalcy even in the menace of the storm. The pounding repetitive sounds - echoes of ritual drums, hammering, or an axe falling - give a rhythmic, trance-like quality to the piece. The sounds of distant waves make us aware of the ocean, as the final destination of the unending flow of the river.
**Fuego / Os fogos / Endings (fire)**

A common practice of the European conquistadores was to burn alive their victims. As they traveled down the Amazon River, Orellana and his men set a Tapajó hut on fire, burning the women and children that dwelt in it. With a touch of irony, the place was christened ‘Town of the Burned.’

Guamán Poma de Ayala (1980), the first native historian, has documented in his chronicles the various atrocities perpetrated by the white invaders. His drawings depict soldiers killing innocent children, Catholic friars sexually abusing indigenous girls, and executioners carving native men alive (Figure 7). Nowadays, the invaders’ motivations and methods have changed somewhat, but their cruelty lingers on.

*Endings (fire)* combines images collected during our journey to the Napo region and documentary material of the bombings occurred in 2002. The Amazon jungle has fostered the creation of myths of a golden land. The most precious treasure lies in the ability of the native communities to make use of the forest’s resources without destroying its ecological balance. This paradise on Earth is quickly being obliterated by the action of timber and oil companies.

![Figure 7. Historian Guamán Poma’s drawings depict the cruelty of the European invaders (Ayala, 1980).](image-url)
El tiempo de los otros / Cuía / To morrow

The first exploration of the Amazon River took approximately eight months. Francisco de Orellana and 59 Spaniards started their journey at the Coca River in current-day Ecuador, on December 26, 1541 and reached the mouth of the Amazon River on August 26, 1542. This huge distance was covered using just two small boats and the rowing force of the men. With present-day means of water transportation, the same trajectory can be covered in about three weeks.

To morrow establishes a parallel between the rhythm of the oars and the rhythm of a woman washing a drinking pot. The intrusion into the heart of the jungle is symbolized by the dynamic images of the forest and the pounding insistence of the oars. These scenes are contrasted with the tranquility of the woman doing her morning ritual of washing. This ritual finds echoes in the legend of the chief that washed himself in the Guatavita pond and covered his body with golden powder - the legend that motivated the search for El Dorado.

The idea of temporal circularity or recurrence was central to pre-Columbian cultures. In this worldview, the center of the world coincides with the center of the village, extending toward the unknown in concentric circles. In To morrow, this is metaphorically represented by the food container, its washing is renewal. Time’s passing is perceived as much slower than in urban societies and responds to the reality of Nature rather than solely to human needs. Water represents life and the fluidity of time.

Diluvio / Aguas de março / Endings (water)

Endings (water) complements the section entitled Endings (fire). As we traveled down the Napo River, on a small canoe, we experienced the force of the tropical storm with its rushing winds and torrential rain. The fragile vessel almost collapsed under the waves. A similar experience was described by Carvajal in 1542. As the Spanish expeditionaries approached the mouth of the Amazon River, huge tidal waves pushed their boats upstream and almost drowned the navigators. These waves are called ‘pororoca’ and are produced by the force of the Amazon waters as they encounter the resistance of the sea tides.

Endings (water) captures some of the countless aspects that water takes within the context of the Amazonian landscape, both as a source of life and as a source of destruction. The constant passage of the images reflects the passage of time and the menace of the catastrophe faced by the Amazonian communities. The material for this section is composed of images recorded during our voyage through the jungle and various shots extracted from war news.
According to the Hellenic myth, Sisyphus was punished by Hades, the Greek Lord of the Underworld, and condemned to lug a large stone up a mountain. Once at the top, the stone would roll mercilessly back down and the process would begin anew, continuing thus, for all eternity.

*Sisyphus* - one of the five sections of *Paititi* - proposes a parallelism between the futile repetitive actions of industrialized societies and the ritualistic temporal recurrence of Amazonian symbolism. *Sisyphus’s* ascension is suggested by the imagetic material of the first video track and by the progressive temporal compression of the edited scenes. A group of men hauls a load of plantains from shore, onto the ship and up the stairs. These images were collected during our voyage on *La Camila* - an old ship that traverses the Napo River from Angoteros to Iquitos in the heart of the Peruvian jungle.

We spent five days on *La Camila*. Every few hours the boat would stop at a small village. The inhabitants would gather around the ship and trade their agricultural products and livestock for modern necessities such as disposable diapers, batteries or alcohol. Day and night, each worker on the boat - like a modern-day Sisyphus - would load the villagers’ goods onto La Camila.

From the sixteenth to the eighteenth century, the Spanish applied the system of *encomiendas* in the Napo and Upper Amazon regions (Landázuri, 1989). The Quijo and Omaguan populations were forced to extract precious minerals from the mines and to produce textiles for the Spanish *encomenderos*. The changes of lifestyles from nomadic to sedentary, the illnesses brought by the white colonists, and the inhuman working conditions had devastating effects on the population of these nations. By the end of the eighteenth century, they had been virtually exterminated. These historical facts are outlined on the second video track of *Sisyphus* by a massive stone cross standing impassively, framed by the clear blue sky. The baroque cross and the close-up shots of Francisco de Orellana symbolize the Spanish presence in the region.

**Comments on Paititi**

Several spectators that visited the installation in the Haim Chanin Fine Arts Gallery reported feeling transported to the Amazonian landscape. The sensation of menace was also commented by some visitors. Commenting on *Vivir sin después*, an EFE reporter has written that “(. . .) one of the most violent manifestations of the wind is the storm, a phenomenon that puts human beings in a state of alertness. *Vivir sin después* recreates the moment of tension effected by the perception of the storm as a danger or as a situation that stands out of the norm. The multimedia piece is set in a dark room with sand scattered on the floor. (. . .) Rhythmic images of kids playing by a river are projected on the walls.
(. . .) Their game is a ritual that repeats itself through time and serves to understand the surrounding reality. (. . .) The sound of the piece was created through digitalization and synthesis processes, obtaining a tridimensional sonic space.” (Villasmil, 2004).

Regarding the sonic aspects of the chapter Vivir sin después, art critic Robert C. Morgan (2004) has stated, “while the actions are simple, the success of Capasso’s narrative is augmented by two additional and indispensable elements: the presence of a darkened sky filled with looming clouds in the background, and a magical, nearly hypnotic sonic environment provided by the Argentinean eco-composer Damián Keller.” He stresses the importance of the working methods utilized in Vivir sin después. “Conventional time was reconfigured through the editing process to create an overlay of simultaneous activity. New cadences of images and sound were discovered as the artists worked with the density of form in relation to time and absence.” His text concludes by highlighting the experiential aspects of the installation space. “In Vivir sin después, we are given a simulated space of abstract ‘change and variation,’ as described by Capasso. Through the vision of this small colono boy against a stormy sky we may begin to see the world differently.”

Summary

This section presented the concepts encompassed by the multidisciplinary project entitled Paititi: A Multimodal Journey to El Dorado. This project – developed through historical research, software implementation, and artistic creation – has yielded an installation work that addresses the current situation of the Amazon Basin, including literary, visual and sonic elements inspired on the historical records of the search for El Dorado. Paititi is proposed as a realization of the ecological approach to composition within the context of multimedia art. Thus, methods for collection, edition, transformation and organization of the audiovisual material had to be brought together within a unified framework. The material utilized in Paititi was gathered in the geographical region determined by the theme of the piece. This visual material was edited by applying multiple views of single entities. The sonic data was synthesized and processed using accumulation and distribution within predefined sonic fields. The piece was structured through modular, open-form processes which permit the recreation of the work for each public performance.
Chapter 7 - Conclusion

The Conquest: historical perspective

The conquest of the American continent, or the *Indias* as the Spaniards used to call it, was the greatest genocide in human history. In less than fifty years, the conquerors not only decimated the indigenous population but also managed to destroy the social structure of millenary civilizations (Fritz, 1922; Las Casas, 1949). Most significantly, a system of beliefs that went directly against these nations’ worldviews was imposed.

Though the driving force of the Conquest was the search for riches, its fuel was the available food. The *modus operandi* of the European conquistadores was to take control of a town either by diplomacy or by force. Once the aboriginal populations were subjugated, the town resources were exploited to exhaustion. From there, a new expedition would be sent to overtake another city. No lasting expedition was possible without the consumption of the food reserves of the local population.

The new continent provided nourishment for a starving army. Potato, cocoa, maize and manioc were the staple foods of the indigenous people. The Spanish soldiers had no tools or intentions to sow the land. Therefore, they had to rely on the local’s hunting and agriculture as their only sources of food. The unconstrained extraction of resources coupled with the disintegration of the social organization in the region precipitated a breakdown of the existing social and economic balance. Within a few years, most aboriginal towns were devastated by poverty and lack of sustainable food production. Ailments resulting from malnourishment and scarcity of resources are endemic to the Napo region today.

The context-dependent symbolism of elements such as corn and gold is made painstakingly clear when we examine the clash of paradigms occurring during the occupation of America. Several authors recount the inability of the Indians to comprehend the obsessive drive for gold of the Europeans (Las Casas, 1949). The Eurocentric system provides an overarching, total conception of the world that seeks to eradicate, rather than accommodate, other cosmologies (Vila Riquelme, 2001), particularly when these are intimately interwoven with the natural environment. The extensive contamination resulting from oil extraction in the Ecuadorian Amazon and the pressure to continuously relocate the extant Indian nations is a case-in-point.

As it has been documented by various anthropological studies, the balance kept over ten thousand years by the Amazonian indigenous communities has been broken by the industrial and agricultural use of the land. The exploitation of wood, oil, or mineral resources is not compatible with the survival of the Amazonian fauna and flora. Extensive agricultural techniques yield quick erosion of the soil. A way to
stop this accelerated process of destruction is to give autonomy to the local communities to preserve their traditional forms of life, keeping the rainforest’s natural resources safeguarded.

**The legend of El Dorado**

In the sixteenth century, the stories told by expeditionaries, the rumors fostered by the aboriginals, and the actual findings of wealth, gave shape to the legend of El Dorado. Namely, El Dorado was conceived as a rich and powerful kingdom, governed by a chief that ornamented himself with gold powder and bathed in a lake into which precious offerings were made. This legend was the primary motivation for several unwieldy expeditions to the most dangerous places in the continent. One journey that provided fantastic descriptions of remote locales was the 1541 Pizarro-Orellana incursion into the land of cinnamon. If prior to this voyage the famous legend had not fully developed, the findings reported by the survivors upon their return and the riches they brought back, gave it solid grounding and triggered a feverish search for El Dorado.

Whilst traversing the Amazon River Basin, the Spanish expeditionaries came into contact with several nations. The first group they encountered were the Quijo, who inhabited the frontier between the Ecuadorian Andes and the lower lands. The Omagua controlled most of the várzea of the Napo and Upper Amazon. The Tapajó inhabited at the confluence of the Lower Amazon with the Tapajós River. These nations are presently extinct, so all data available come from historical reports and archeological findings.

At the end of 2002, videoartist Ariadna Capasso and I followed the course of the Napo and Amazon waterways in the footsteps of the 1541 Orellana expedition. More than sixty hours of video footage and multichannel sound recordings were collected along remote sites of the Napo and Amazon Rivers. This experience not only yielded the raw material for the installation *Paititi*, but also forced us to reconsider the objectives of the project as a whole. The focus of the piece shifted from a historical reconstruction to a reflection on the present-day conditions of the Amazonian várzea contextualized by the historical and ethnological data.

**Paititi: concepts, methods and developments**

*Paititi* is an audiovisual installation that focuses on the current situation of the Amazonian region having as a geo-historical frame the first expedition into the Amazon. The visual material includes original footage taken along the Coca-Napo-Amazon route and images extracted from media war news. The sonic material features on-site recordings of people and animals of the region and sounds
synthesized through ecological models. The literary texts used as a conceptual support for the piece encompasses documents written by the conquistadores, reports by local inhabitants, and original prose inspired on historical events and oral tradition. The methodology employed in the creation of Paititi cuts across several fields. Areas addressed include: ecological modeling of environmental sounds, audiovisual compositional techniques, and reenaction as a conceptual paradigm.

The conceptual framework for ecological modeling is extended to encompass the elaboration of multimedia works. The basic requisites of ecologically-based sound models are the following: modularity, stability, consistency, context-dependence, and scalability. Isomorphism, playability, and identity are discarded as necessary modeling attributes of sounds produced by physical agents. Synthesis and spatialization techniques are integrated within a unified computational system. Ariadna Capasso and I have introduced methods in video-editing and composition which are consistent with ecologically-based manipulation of sounds. Anchoring is proposed as a way to bring together the geographical and historical contexts of the work. Linked to this concept, reenacting is employed as a compositional paradigm. In other words, the situation contemplated as a geo-historical frame for the piece is reproduced ‘in vivo’.

Several composers located in various parts of the globe are currently developing work based on the ecological perspective (Burtner, 2002; Di Scipio, 2000; Fontenele, 2004). Their music proves that the ecological approach does not hamper the development of a personal musical language. Paititi: A Multimodal Journey to El Dorado is offered as a humble contribution within this growing field of work.

I believe that open-form works which encompass the process of creation open up new possibilities of art fruition. From this perspective, the artwork is the result of living the theme of the work. This life experience is offered to the public as a field of possibilities which can be freely explored and recombined. Through the process of anchoring, the piece is situated in a specific time and place. Thus, the ‘spectator’ creates his own artistic experience from the living experience facilitated by the work. Through the informed and active involvement with the artwork, a door to a new perception of reality may be opened.
Appendix

Table 3. Timeline of the Pizarro-Orellana Expedition.

<table>
<thead>
<tr>
<th>Date</th>
<th>Place</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 15, 1541</td>
<td>Quito</td>
<td>Gonzalo pizarro departs from Quito with 220 Spaniards and 4000 natives.</td>
</tr>
<tr>
<td>March</td>
<td>Quito</td>
<td>Francisco de Orellana departs with 23 Spaniards.</td>
</tr>
<tr>
<td>End of March</td>
<td>Zumaco, Town of Moti</td>
<td>Orellana joins Pizarro.</td>
</tr>
<tr>
<td></td>
<td>Town of Capua</td>
<td>The expedition encounters Cofan chief Delicola.</td>
</tr>
<tr>
<td></td>
<td>Coca River, 120 km. downstream</td>
<td>A brigantine is built. All 4000 servants have died. ‘Pueblo El Barco’</td>
</tr>
<tr>
<td>Dec. 26</td>
<td>Napo-Coca junction (half-a-league width)</td>
<td>Orellana embarks with 57 soldiers and 2 friars. They travel 120 km. in nine days.</td>
</tr>
<tr>
<td>Jan. 1, 1542</td>
<td></td>
<td>Sound of drums.</td>
</tr>
<tr>
<td>Jan. 3, 1542</td>
<td>After the Aguarico-Napo confluence</td>
<td>120 km. before Curaray-Napo confluence, they find the Omagua leader ‘Aparia the lesser’.</td>
</tr>
<tr>
<td>Jan. 3-Feb. 2</td>
<td></td>
<td>2000 nails are made.</td>
</tr>
<tr>
<td>Jan. 4</td>
<td></td>
<td>Francisco de Isásaga is named scrivener.</td>
</tr>
<tr>
<td>Feb. 2</td>
<td>Curaray-Napo junction, 120 km. downstream</td>
<td>Irimara land.</td>
</tr>
<tr>
<td>Feb. 12</td>
<td>Napo-Amazon junction</td>
<td>The large island of the confluence is reported as two rivers. Saint Eulalia’s confluence.</td>
</tr>
<tr>
<td>Feb. 26</td>
<td></td>
<td>Omagua leader ‘Aparia the great’.</td>
</tr>
<tr>
<td>March 1</td>
<td></td>
<td>Orellana resigns and is reinstated as captain.</td>
</tr>
<tr>
<td>Feb. 26-April 24</td>
<td></td>
<td>Brigantine is built in 41 days.</td>
</tr>
<tr>
<td>May 6</td>
<td>Machiparo land</td>
<td>Crossbow nut lost and recovered.</td>
</tr>
<tr>
<td>May 12</td>
<td></td>
<td>Machiparo villages. 18 wounded and 1 dead. Harangue by Orellana.</td>
</tr>
<tr>
<td>May 13</td>
<td>Narrow pass</td>
<td>They leave Machiparo land.</td>
</tr>
<tr>
<td>May 14</td>
<td></td>
<td>They leave Machiparo land.</td>
</tr>
<tr>
<td>May 16</td>
<td>Omagua land</td>
<td>Chief Paguana. They rest for 3 days.</td>
</tr>
<tr>
<td>May 23</td>
<td></td>
<td>‘Pueblo de la Loza’. Giant idols.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘Pueblo de los Bobos’</td>
</tr>
<tr>
<td>May 29</td>
<td></td>
<td>‘Pueblo Vicioso’</td>
</tr>
<tr>
<td>June 3</td>
<td>Negro River junction</td>
<td>They rest for 1 day.</td>
</tr>
<tr>
<td>June 5</td>
<td></td>
<td>Sun temple.</td>
</tr>
<tr>
<td>June 7</td>
<td></td>
<td>Several natives are hanged.</td>
</tr>
<tr>
<td>June 10</td>
<td>Madeira River junction</td>
<td></td>
</tr>
<tr>
<td>June 13</td>
<td>Tapajós land</td>
<td>Fortified village.</td>
</tr>
<tr>
<td>June 14</td>
<td></td>
<td>A house is burned with women and children inside. ‘Pueblo de los Quemados’</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Event</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>June 21</td>
<td>‘Pueblo de la Calle’</td>
<td>‘Pueblo de la Calle’</td>
</tr>
<tr>
<td>June 23</td>
<td>Savanna</td>
<td>‘Pueblo Escondido’</td>
</tr>
<tr>
<td>June 24</td>
<td>Arripuna Land</td>
<td>Fight with the Amazonas. Carvajal is hit in the eye.</td>
</tr>
<tr>
<td>July 1</td>
<td>Tapajós River</td>
<td>Antonio Carranza dies of a poisoned arrow wound.</td>
</tr>
<tr>
<td></td>
<td>junction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Savanna land</td>
<td>‘Pororoca’ starts to be felt.</td>
</tr>
<tr>
<td></td>
<td>Carib land</td>
<td>Amazon Delta</td>
</tr>
<tr>
<td>July 20</td>
<td>Carib land</td>
<td>San Pedro brigantine sinks. Victoria brigantine is dry.</td>
</tr>
<tr>
<td>Aug. 6</td>
<td></td>
<td>Transfiguration day. They find a tapir floating on the water.</td>
</tr>
<tr>
<td>Aug. 8</td>
<td></td>
<td>They finish repairing the small brigantine and making nails. (18 days)</td>
</tr>
<tr>
<td>Aug. 24</td>
<td></td>
<td>They reach the mouth of the Amazon.</td>
</tr>
<tr>
<td>Aug. 25</td>
<td></td>
<td>They make cables and ropes for the rigging of the brigantines.</td>
</tr>
<tr>
<td>Aug. 26</td>
<td>Marajó Island.</td>
<td>They collect water, maize and roots and leave for the sea.</td>
</tr>
<tr>
<td></td>
<td>Mouth of the Amazon.</td>
<td></td>
</tr>
<tr>
<td>Aug. 29</td>
<td>Gulf of Paria</td>
<td>The brigantines get separated.</td>
</tr>
<tr>
<td>Sept. 9</td>
<td>Island of Pearls</td>
<td>Orellana’s small brigantine, San Pedro, gets to Cubagua Island, Nueva Cádiz.</td>
</tr>
<tr>
<td>Sept. 11</td>
<td></td>
<td>Carvajal’s large brigantine, Victoria, arrives at Cubagua. Total returned: 43 Spaniards and two negro slaves.</td>
</tr>
</tbody>
</table>
Table 4. Schedule and locations of the Keller-Capasso Expedition.

<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>December</td>
<td>15 - 22</td>
<td>Quito</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Coca</td>
</tr>
<tr>
<td></td>
<td>24 - 25</td>
<td>Laguna Verde</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>Coca</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>Laguna Pagualicocha</td>
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<tr>
<td></td>
<td>28</td>
<td>Añango</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>Coca</td>
</tr>
<tr>
<td>January</td>
<td>30 - 3</td>
<td>Quito</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Coca</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Nuevo Rocafuerte</td>
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<tr>
<td></td>
<td>6</td>
<td>Pantoja - Vencedores</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Angoteros</td>
</tr>
<tr>
<td></td>
<td>8 - 12</td>
<td>La Camila (to Mazán)</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Stop at Santa Clotilde</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Iquitos</td>
</tr>
<tr>
<td></td>
<td>14 - 17</td>
<td>Yanayacu River</td>
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<tr>
<td></td>
<td>18</td>
<td>Iquitos</td>
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<tr>
<td></td>
<td>19 - 20</td>
<td>Manuel (to Tabatinga)</td>
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<tr>
<td></td>
<td>20</td>
<td>Tabatinga</td>
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<tr>
<td></td>
<td>21 - 24</td>
<td>Elizabeth II (to Manaus)</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>Manaus</td>
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<tr>
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<td>26 - 30</td>
<td>Cuieras Reserve</td>
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<td></td>
<td>31</td>
<td>Ajato (to Santarém)</td>
</tr>
<tr>
<td>February</td>
<td>1 - 3</td>
<td>Rodrigues Alves (to Belém)</td>
</tr>
<tr>
<td></td>
<td>4 - 7</td>
<td>Belém</td>
</tr>
<tr>
<td></td>
<td>7 - 9</td>
<td>Transbrasiliana (to Brasília)</td>
</tr>
</tbody>
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References

Bibliography


Aires: Fundación Alfonso y Luz Castillo.


**Discography**


