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Visualizing the Past/Peopling the Past

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**Ayahuasca in the Bolivian Amazon**

Introduction

 Recreating past civilizations is an incredible challenge. Reconstruction artists have trouble staying accurate to past civilizations’ history while capturing the audience’s attention. Working with archaeologists while maintaining artistic integrity is often the solution to appeasing both sides. However, deciphering what measures the conservation of such integrity is difficult. Additional challenges may be encountered when deciding what object or objects embody the time period or topic that the artist is recreating. Visualizing the past can be publicized in a variety of media: traditional art, video games, publications, and more. Art is a mode of communication and the importance of communicating history is undeniable. Archaeology relates to humanity by studying people and the interpretation of their activities in the past. Thus, art is incredibly important to incorporate in archaeological studies. A piece of art can spark someone’s interest through the content of the piece or motivate the viewer to create better representations on their own. Art can spread awareness of topics that cannot be spoken of in other contexts. Through the recreation of past civilizations in 3D media, artistic technique is incorporated as well as attention to detail that people appreciate. 3D modeling and animation can be seen in television programs, films, advertisements, and web design. The creation of 3D figures can be spread throughout the world in different ways and is a great mode of reconstructing the past accurately while having people appreciate the artistic quality of the models. 3D is a type of art that is widely renowned and is the perfect medium for recreation.

Objective

 Through this project, I researched the process and the purpose of using hallucinogenic and medicinal plants, specifically ayahuasca, by shamans in the Bolivian Amazon to artistically reconstruct the plant and the process of creating the tea. I used three sources to do my research that range from information on the technical aspects of ayahuasca to detailed accounts of shamanism. I will also model the ayahuasca vine and the preparatory processes of creating the ayahuasca tea.

Rationale

 Shamanism was a large part of Bolivian culture and ayahuasca within shamanistic culture was highly regarded. When choosing a topic for this project, I was motivated by the reasoning behind the use of ayahuasca: why did the shamans use that specific plant? What made ayahuasca so important? The history behind hallucinogens and medicinal plants has always interested me and the use of these plants has evolved over time, changing the meaning. Thus, I was geared toward the botanical side instead of the ritual side of the practice. Botany has peaked my interest since a young age. My grandmother always named flowers whenever we would pass them on walks and she was an avid gardener. My aunt also has a large garden in her backyard that she constantly maintains. My grandmother and my aunt have been incredibly impactful throughout my life and learning about plants holds higher meaning because of this. By developing a greater understanding of the history of ayahuasca and hallucinogens in general, I have further appreciated different types of plants. The past better helps people understand the present, and consequently the future, which is why I chose to research ayahuasca in Bolivian Amazonian shamanism.

Research

 Shamanism is a practice that involves a shaman reaching altered states of consciousness to interact with the spirit world and channel transcendental energies. Shamanism varies in different regions of the world. In the Americas, and Amazonia specifically, the spiritual leaders act as healers. Some Amazonian shamans perform a soul flight which entails healing, flying to the sky to consult cosmological beings to get a name for a newborn baby, flying to the cave of peccaries' mountains to ask the father of peccaries for abundance of game, and flying deep down in a river, to achieve the help of other beings. Thus, they are thought to reach sky, earth, and water. Healers practice shamanism among the Mapuche in Chile, Aymara of South America, and Fuegians of Tierra del Fuego. Some shamans specialize in the use of ayahuasca. Western spiritual seekers claim that the *ayauasqueros* and their ayahuasca brews have cured them of everything from depression to addiction to cancer.

Ayahuasca, also known as the “soul vine” or yagé, is a hallucinogen and powerful tool in Amazonian shamanism. Hallucinogens were distinguishable from medicinal plants in that they were used in a more spiritual sense. Josep Barba points out that, “Ayahuasca is a vegetable decoction used by Amazonian shamans in their rituals of divination and cure” (2003: 194). The spirit world was communicated with by the shamans when in a hallucinogenic trance. In shamanism, the patients were not the ones who used the hallucinogens. According to Barba, “[ayahuasca’s] consumption is usually reserved to the shaman, who obtains from the drug his knowledge, although in some tribes it is consumed in a collective ritual. It is not strange, then, that for the tribes that use it constitutes a fundamental piece of cultural identity” (2003: 196).

When in the trance, one may identify with geometric patterns they see by saying "'I am fretwork; I hear what I am seeing; I think what I am smelling; everything is fretwork ... I am music, I am climbing in music; I am touching fretwork; everything is the same'" (Stone 2011: 14). Distinctions between the present and the future, the human and the animal, terrestrial and celestial or underworld perspective, are routinely omitted as well during trance. After ayahuasca intake, “there is usually a half-hour lag time until the first effects are felt … [and] psychological effects reach a maximum intensity after one and a half to two hours” (Dominguez-Clave et al 2016: 8). To prepare ayahuasca, sections of the vine are soaked and boiled alone or with leaves from other plants such as chacruna, chaliponga, and *Mimosa tenuiflora* or other ingredients that vary from one shaman to another. The traditional making of ayahuasca follows a ritual process that requires the user to pick the lower chacruna leaf at sunrise, then say a prayer. A wide range of water infusions and decoctions “prepared from this vine, alone or in combination with other plants” (Dominguez-Clave et al 2016: 4). The vine must be cleaned meticulously with wooden spoons and pounded with wooden mallets until it's fiber. The process takes several hours, often taking place over the course of more than one day. After adding the plant material, each separately at this stage, to a large pot of water it is boiled until the water is reduced by half. The individual brews are then added together and brewed until reduced significantly. This combined brew is what is taken by participants in ayahuasca ceremonies.

In terms of the ethnobotany of the ayahuasca plant, “the ethnopharmacology of ayahuasca has aroused a growing interest, driven mainly by the stories of the researchers who consumed it and validated the interest of its psychic effects and the importance of its use in indigenous cultures” (Barba 2003: 196). Ayahuasca is a psychotropic tea obtained from Amazonian plants. Ayahuasca “induces visions, intense emotion and recollection of personal memories. Ayahuasca enhances self-acceptance and beneficial mindfulness capacities. Available evidence suggests its potential to treat various psychiatric disorders” (Dominguez-Clave et al 2016: 1). Further, the brew has as a basic ingredient the bark of “a liana of the genus *Banisteriopsis* that provides beta-carbolines that inhibit monoamine oxidase (MAOI), and a plant-additive that is the main responsible for the psychic action” (Barba 2003: 196). As of modern times, more than nine different plants are known to be used as hallucinogens in the Bolivian Amazon. The ayahuasca plant is grown with special care and has been described to look like the shrub laurel. The leaves are cooked or squeezed, and the resulting juice is ingested to cause the hallucinogenic effects followed by a day-long headache and insomnia. The pros far outnumber the cons of utilizing this plant, though, especially in shamanism.

Shamanism was an integral part of the Bolivian society and culture, and so was the use of ayahuasca. The shamans were praised for their visions while on the drug and ayahuasca provided an exceeding amount of information about one’s life and future. When someone drinks the ayahuasca tea, a great psychic stimulation leads to intense visions (Figure 1). These visions were thought to only change the ability to communicate with the spirit world, rather than the physical world. No change exists in how someone would exist in the physical world while using the hallucinogen. In Shamanistic rituals, the use of enchantment or otherworldliness is stressed.

 Testimonies are present from people in the late 1970’s and early 1980’s who have used the hallucinogen for divination or medicinal cure (Barba 2003). Barba says, “Among the most spectacular effects attributed to it, is the possibility of traveling through time and space and to contemplate places and events inaccessible to senses” (2003: 196). The people on the drug see various colors, go on adventures populated by animals, and could witness the creation of men, women, rivers and animals. These visions can be used for healing, which is practical, in which the shaman envisions the illness in the body of the patient to then cure. The shaman would be able to find the cause of the evil in the patient’s body and transfer a spell to cure them. In another case, hallucinations would be used as a chance to travel to a different realm, as previously described. If you want to know “if something has been stolen or disappeared; the infidelity of spouse or, also what is to happen (for example, when and with whom will marry, if the son will be male or female, etc.)” (Barba 2003: 198), you should use ayahuasca. Wisdom was not only present about healing when using the drug. Another testimony from a contemporary Bolivian shaman reveals that “during and after the trance, [she] believed the snakes had revealed great wisdom, providing perspective about human hubris and our actual inferiority in the natural order” (Stone 2011: 39). Hallucinations have beneficial attributes when understanding the future and do not affect the present. This practice was reserved for the shamans in Bolivian Amazonian culture.

 Ayahuasca has been used as an important resource throughout Bolivian Amazonian culture. The process of creating the tea was taken seriously and the ethnobotany of the plant suggests that many past civilizations utilized the vine to have helpful hallucinations. A large amount of channeling transcendental energies in shamanistic ritual were derived from the use of ayahuasca. Aiding in the diagnosis of diseases, the ability to see into the future, and the aptitude to see into another dimension, ayahuasca was a main point in healing in Bolivian Amazonian shamanism. Today, ayahuasca is used in much fewer common practices such as secret rituals, but ayahuasca is still centered in the Bolivian Amazon. In the past civilization, though, the cultivation of the plant was highly respected in shamanism and greatly utilized.

Reconstruction of the Ayahuasca Vine and Extraction Process: 3D Modeling

 The process of harvesting and extracting ayahuasca comprises of cutting the bark of the ayahuasca vine, picking off the shrubs and consequently the leaves, and brewing them in a boiling pot of water. Using Autodesk Maya, I first modeled the ayahuasca vine (Figure 2). To do so, I created the shrubs that are connected to the winding bark (Figure 3). These shrubs have long tubes that act as the veins of the leaf (Figure 4) and small flowers. Each shrub with its seven leaves were modeled from Maya’s auto-created rectangular planes. Their vertices and edges were then altered to copy a leaf shape. I used a photograph of the shrub (Barba 2003: 193) (Figure 5) and placed it onto an image plane. I then moved vertices such that the leaf matched the image. I utilized the same photograph and a technical botanical painting (Figure 6) to create the flowers. These flowers have spheres in the center, three cylinders with long ovate attached coming out of this center circle, and cylinders modeled to become the petals. Four flowers populate each shrub. The petals are pink, the center ball and cylinders coming out of the ball are yellow, and the rest of the shrub is green. For everything except the leaves, I used a color picker and the Blinn-Phong premade shading model to texture the objects. For the leaves, I imported a photo of an ayahuasca leaf and used that as the texture. Finally, I combined all of the elements to create a cohesive shrub. For the main body of the vine, a YouTube tutorial demonstrated how to create a twisting effect with four cylinders (Hermes 2015). The ayahuasca vine looks like a thick, winding rope so this tutorial was helpful. To create such an effect, one must place four cylinders with a height of zero surrounding the intersection of the x, y, and z axes. Then, a curve for the cylinders to wrap around is created. I was then able to extrude the cylinders around the curve and adjust how many times the cylinders twist around the curve. I made the curve that the vine wraps around straight and twisted the vine one-thousand times. The vine also has seventy-five subdivisions within the mesh. I used the Maya generated wood texture and handpicked the colors to create a similar texture to the real ayahuasca vine for this twisted bark. I imported the shrubs from a separate Maya file into the main vine file and connected them to the main body of the vine by duplicating the shrub nineteen times. I then imported an adult human model into the scene to represent the shaman and show scale. The vine is long and branches repeatedly, so to display the vine with a human has the top of the vine cut off (Figure 7).

Next, I created the preparatory scene of brewing the tea. I first created the pot, which today is usually made of metal. In the pre-Columbian Bolivian Amazon, the vessel would have been ceramic. For the pot, I utilized a cylinder and extruded the top face down into itself. The top loop of faces on the outside of the pot were extruded outwards. I created another cylinder for the top of the pot which is just slightly bigger than the top face. I imported a ceramic texture and used that for the pot. I placed a cylinder into the pot and imported a water texture. For the liquid in the pot, I altered iridescence and shading to create a boiling look. These were both Blinn-Phong shading models. I made a drinking vessel which was most commonly a tree gourd cut in half to form a small bowl like cup. This cup that the tea would be poured into was created by cutting a sphere in half and extruding the faces inward, creating a cut open gourd. I filled the tan-brown cup with a cylinder to create the tea’s liquid and used a dark brown color for the texture. I created fourteen long rectangles to place under the pot that represented the wood fuel for the fire and used an external wood texture. Next, I imported a singular leaf that was already created from the ayahuasca plant. I duplicated the leaves to create a pile of ayahuasca leaves. I then scaled up three leaves to act as the larger leaves that the shamans used in the brew. I created new cubes and altered them to look like the cut bark or bark scrapings which were to be put in the pot as well (Figure 8). An adult human model to represent the shaman was also put into this scene to show scale. The pot would be around knee height in reference to the Shaman brewing the tea.

 To create the back to back images that make a flipbook animation, I took screenshots of the full vine, then the shrub being plucked which was the shrub alone, then a leaf plucked which was a solo leaf, then cut to the set up with everything laid on the ground, then smaller leaves placed in the pot, then the bark placed in the pot, then the bigger leaves placed in the pot, then the top placed on the pot, and the resulting drink. These screenshots tell the story of how the plant is harvested and the tea is produced (Figures 9 – 15). Altogether, this creates a storyboard of the process (Figure 16).

Motion Capture and Animation

 In the Sig Lab, I participated in motion capture as a director to create and record movements relevant to my project. My actor mimed placing leaves into a pot, collecting a pile of leaves and bark, and placing those into a pot, and stirring the pot. I do not have photographs of the motion capture process, unfortunately. Although I was planning to rig a 3D shaman model for animation, the time constraints caused this to be impossible. Further, because I was unsure of how to work with rigs in Maya, I did not work with that type of animation or modeling.

Results of Recreating the Production of the Ayahuasca Tea

 As with many recreations of the past, the finalized outcome of this project has a few issues. The adult human model used to represent the shaman that was imported was not configured correctly so the face’s features such as her eyes or jaw were a bit bulging and not life-like (Figure 17). The actual vine tends to be multiple vines that grow twisted around each other and the number of leaves may range from sparse to leafy. I am happy with how the models turned out to create an objective and accurate view of the ayahuasca vine and the process of brewing the tea. Through learning about the significance of ayahuasca in Shamanistic culture, I have gained a better understanding of the reason shamans utilized ayahuasca. The 3D models are hopefully an accurate depiction of the important plant. I would have liked to animate human models to create a better understanding of the entire process the shamans went through. It would have been informative to create another scene and change the colors of the scene to emulate the shamans’ visions. These ideas may be able to be done in the future if this project is continued. In a continuation of this project, the motion capture may be utilized, and further explanation of the hallucinations should be explored. The next step could be placing these scenes into the Unreal to emulate an entire garden and create a broader world. A fire could be simulated as well as a boiling effect for the liquid in the pot. The project led to a recreation of ayahuasca’s harvest and tea production in the Bolivian Amazon. This project has taught me about Maya and 3D modeling as a whole and has inspired me to continue to learn about visualizing past civilizations.

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