TAPETE
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RAREFACCIONES: USANDO EL ARTE PARA EXHIBIR LA CONTAMINACIÓN HUMANA

RAREFACTIONS: USING ART TO EXHIBIT HUMAN CONTAMINATION

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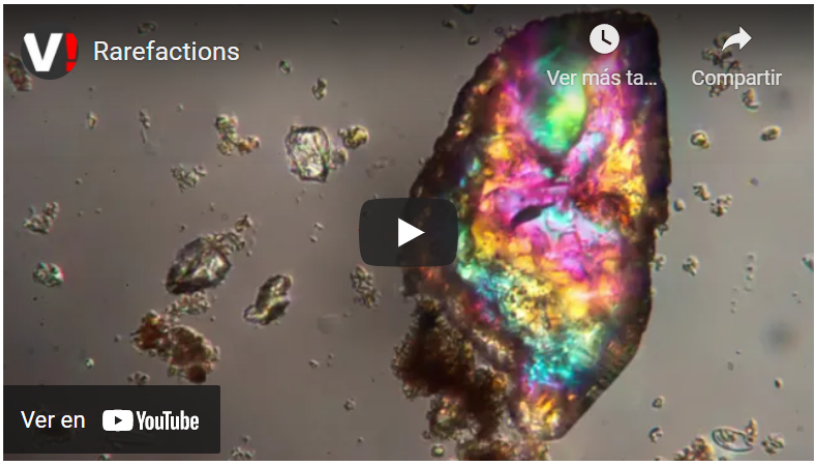
Abstract

Latin American rivers are suffering due to pollution that originates from urban areas. These rivers are struggling with contaminants such as factory discharge, pesticides, and pollutants. Environmental art has played an important role in creating awareness of such climate change-related consequences. This paper exposes different types of environmental art displays and how scholars have examined audiences' reactions to these works. These expositions include one of my videos, "Rarefactions", which shows microorganisms that live in bodies of water in and around urban zones, especially in the Atoyac River, in Mexico. These microorganisms can be found in almost any body of water. Thus, it will resemble the problems we are facing not just in Mexico but also across Latin America. Through environmental art, I can discuss how people can change their perspectives so that there can be better solutions to river pollution.

Keywords: Environment, Art, Pollution, Rivers, Latin America



Available at: https://www.youtube.com/watch?v=9_oJqv-wUwM

1 Rarefactions

Most lifeforms exist in a symbiotic environment, and urban spaces exemplify the diversity of organisms in our environment (Money, 2016). This essay explores one way in which urban ecology facilitates the communication of distinct organisms. In this video, I use images of microorganisms and the sound they produce to communicate the concept of "Rarefactions". The video shows us microorganisms that can be found in the waters of urban cities. It is a new form of communication between humans and non-humans. Such a communication process can be found in any urban city since we all depend on bodies of water. The essay explores different ways in which microorganisms are important for rivers like the Atoyac in Mexico. This river is the most polluted of those in the whole country. Thereafter I explain how art can change people's perception of their environment.

Rarefactions in physics is a longitudinal wave that emanates from an acoustic source, the region where the particles are farthest apart. The video is named this way because the microorganisms make a sound as if they were trying to communicate with us. They create this sound through a spectrogram. The images were taken from different parts of urban ecosystems, and they were photographed with a microscope. Then when you pass the image through a spectrogram it converts the image to sound. These sounds communicate with us as well as the images. Every sound has a longitudinal wave and can travel for long distances. This is why the video wants the massage to travel to many people so that they can view climate change with different eyes.

From Latin America to Europe, ciliates, vitamins, and algae are present in every part of the world. They are an important part of our environment. Puebla is a major city in Mexico that has 22 rivers (INEGI, n.d.). The river Atoyac is a significant feature of the urban ecology of Puebla as it passes through the city where 6.169 million people live. The Atoyac River is born in the Sierra Nevada in Puebla and expands over 200 kilometers. It crosses the state of Tlaxcala and then returns to Puebla. Later the river flows into the Balsas river which then after 700 kilometers it finally deposits the water in the Pacific Ocean. (Alvear, 2020). This river accommodates a heterogeneous community of life forms as it flows between the human-made edifices that surround and cohabit the river's space. The interaction between bodies of water and humans is very significant, but we are unable to see what the water contains at a microscopic level.

Organisms in the water such as ciliates and algae help the water stay healthy. Ciliates are predators of bacteria and protozoa, which also provide nutrition for other organisms. Algae such as diatoms function as food for other organisms and they can serve as ecological indicators since they are very sensitive to changes in the environment. Additionally, other types of algae serve as food for other animals such as fish. (Dopheide, 2009). However, these ecological interactions and activities go unnoticed by the human eye. We are unable to observe these phenomena without the assistance of scientific equipment. Therefore, this video enables us to witness how these microorganisms coexist in a shared environment. By using this artistic lens, we learn the significance of these overlooked lifeforms.

Pollution is a burgeoning global development, and Latin America's nature is suffering from this human-induced challenge. La Plata basin in Argentina is one example of a body of water in Latin America that is hurting due to pollution. Agricultural activity has increased pesticides in its body of water. (García Mejía, et al., 2019). Among Latin America's suffering natural marvel is the river Atoyac. It is one of the most polluted rivers in Mexico, endangering the health of the communities that live around it. According to "Ríos tóxicos: Lerma y Atoyac", environmental researchers have found an elevated number of people in the communities near the river to have leukemia and kidney damage. Heavy metals such as cadmium and chrome are present in the river, which

contribute to the growth of cancerous cells in humans. The cause of pollution in the river Atoyac is due to textile, automotive, petrochemical, pharmaceutical, and metalworking industries. (Fricke, 2014). These industries are detrimental across the Latin American environment, which the case of the Atoyac elucidates at a local level to relate to this regional experience.

The Mexican/Puebla government applies fines to any factory that discharges toxic waste into the river. However, enforcement is scarce and has not inhibited continuing toxic pollutants into the river. The Sao Francisco River in Brazil has some of the same problems as that of the Atoyac in Mexico. They have found that the water quality is polluted above the standard established by the local government (García Mejía, et al., 2019). The same is happening to many rivers in Latin America that are close to urban cities or that pass through agricultural towns. The river Lao in Chile has now been polluted thanks to detergents and mining (Román, Valdovinos, 2000). The project "Rarefactions" relates to not only Mexico but also several rivers in Latin America since the context of the video art is not based on a single place but several. This interconnected experience is because many cities in Latin America are suffering the same fate of contamination of their rivers and bodies of water.

There has been wider research that explores how art can change people's perceptions about climate change (Chaiyong, 2020). The artist Michael Pinsky also works with representing the invisible. With his work "Pollution pods" he wants to see the reaction that climate art can bring in audiences. Art can reflect the reality of our daily lives and it can also alter people's behavior (Sommer, 2020). Humans tend to forget our immense relationship with other organisms that share space with us. Pollution and the environmental crisis have lost their meaning and we have grown accustomed to this practice of neglect. Art can invigorate new meaning for us; it can make us reflect. "Rarefactions" reminds us that we share the same space with microorganisms as they represent the same invisibility as the "pollution pods".

This video aims to portray another way of seeing and listening to microorganisms as well as how to experiment with the relationship between image and sound. The video exposes to the spectator how microorganisms live around them. It conveys that microorganisms must be present in any healthy river or body of water to remain wholesome. Without ciliates, algae, or vitamins rivers and other larger organisms that live in the water will die. The video "Rarefactions" has similarities to "The Big City: A Microbial Tour of a Metropolis" by Aeon Video. The latter shows the microorganisms making urban-like sounds to create a relationship between two worlds (The Big City: A microbial tour of a metropolis, 2019). The two videos make the viewer focus on the symbiotic relationship we have with microorganisms that live in the city. Because microorganisms are invisible to the human eye, human organisms consider them irrelevant. By enlarging the invisible micro-world, my video has a valuable visually induced impact on people on which they are guided to reflect.

Another artist has successfully visualized the pollution connected to microorganisms. Sukonthip Pimparian achieves this goal by using the example of honeybees in bee farms. She shows beehives which have a black part and a small part that is still the color of a natural hive (Fricke, 2014). This exposition makes the observer feel as if bees had become extinct. She magnifies the presence of pollution in beehives, stating how they are affecting honey production in bee farms. She communicates what we normally do not see inside a hive and she leads us to reflect upon what our lives would be like without bees. My video complements her work to continue the effort to visualize these important ecological issues.

To conclude, by communicating and making visible the micro world in bodies of water, we will work towards a better understanding of our rivers – not just in Mexico but across Latin America. This practice will produce different views about toxic discharge in the Atoyac among other rivers, leading to creative solutions. In order to de-normalize the presence of pollution and environmental problems art will be able to continuously remind us that contamination is not normal. With videos like "Rarefactions", we can be more conscious about what lives around us and we can reflect upon the ongoing problem. Consequently, we can take better care of the rivers once we appreciate what is inside them. As Chaiyong highlighted, art can change people's perceptions (Chaiyong, 2020).

By trying to understand how art can change people's emotions, the authors found that emotions from the artwork are what makes viewers support climate policies (Sommer, 2020) "Rarefactions" visualizes lives that are still being neglected by pollution; it communicates using sound and image. Viewers become immersed in the sound and the image. Microorganisms are not usually seen by the public (unless they view life through a microscope all the time). Thus, this video exposes a large-scale version of the microorganisms that live around us. The video creates universal imagery and sound that can resonate in all urban cities with rivers, ponds, or lakes, just like they do in the Atoyac in Puebla.

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