Special Section: ArtScience/Watershed

ABSTRACT OF: ACID LOVE: MINES, REMEDIATION AND ENSEMBLES OF THE WITWATERSRAND

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Acid mine drainage (AMD) is the result of complex interdependencies between geological, ecological and cultural agencies. Its effects have been disastrous throughout the world, including South Africa's Witwatersrand. Colonial and capitalist attitudes toward the environment have precipitated the contemporary situation; scientific approaches to remediation must be complemented by the development of alternative sensitivities. Sound art may work toward such an end, as discussed in this paper via *Acid Love*, an installation produced for the Watershed exhibition in Johannesburg in collaboration with the Centre in Water Research and Development at the University of the Witwatersrand. The piece, inspired by poet and performance scholar Fred Moten's articulation of the term "ensemble," presents AMD as an expression of unreconciled yet interdependent human and nonhuman action [1].

Johannesburg has its origins in the extraction of gold and labor from the Witwatersrand Basin—one of the oldest geological formations on Earth—with colonial labor structures sedimenting into inequities that persist into the present day. Mining in the region has also produced a legacy of six billion tons of tailings piles. When exposed to water and oxygen, discarded pyrite undergoes a chemical transformation, separating into iron and sulfate and releasing acidifying hydrogen ions. This acid subsequently dissolves the surrounding rock, releasing heavy metals and exposing more pyrite. The result of such chemical feedback is acid mine drainage (AMD), which flows into old mining tunnels and groundwater, destroying local ecologies and compromising plant, animal and human health [2]. However, one form of bacteria, *Acidithiobacillus ferrooxidans*, thrives in highly acidic conditions and accelerates the acidification process [3].

This paper explores how the interrelations at work in AMD are not well described by the term "environment," as this suggests a passivity that *A. ferrooxidans*, among others, defies. Contemporary humanities scholarship has introduced a host of alternatives, such as "vibrant matter" and "assemblages," in an attempt to remediate Western discourse. Fred Moten's "ensemble," while not originally applied to geology or ecology, nonetheless resists colonial narratives of dominance over nature. Ensemble speaks to the improvisatory, multivocal, and potentially agonistic interactions that occur within human and nonhuman relationships, and the sonicity of the term implies an ongoing process and allows for invisible forces [4].

Ensembles of AMD in different parts of the world are interrelated even as they are situated in local conditions; prior work in Colorado brought the author to Johannesburg to collaborate with CiWARD. University research into remediating AMD is motivated not only by concern for public health but also by the commercial potential of rare earth metals it contains, which are essential to the digital media economy. CiWARD's approach uses "bioreactors" that incorporate living and non-living agents that extract metals and produce potable water as an ensemble effect [5].

The sound artwork *Acid Love* comprises vessels of AMD gathered from a CiWARD research site on the outskirts of the city and installed at the Tshimologong Precinct, a former nightclub turned digital innovation center in downtown Johannesburg. The vessels are connected in an electrical circuit that incorporates the conductivity of the dissolved metals and which produces sound. The sound is further modulated by data from the bioreactors. The installation itself also performs a remediation—over time the metals will precipitate to the bottom of the vessels, and both the sound and the color of the water will subsequently change.

Acid Love demonstrates how a resonant substance like AMD is an access point through which to engage with an otherwise intractable scale of interdependencies. The color, smell, conductivity and toxicity of AMD make it available to the "ensemble of the senses" [6] in a way that can be approached as art. The questions that immediately follow ask what it is and how it came to be. This paper discusses how the work is, therefore, a means of participating in, rather than representing, the ensemble of AMD.

Fig. 1. Acid Love, 2018. Installation at Tshimologong Precinct, Johannesburg featuring AMD and audio electronics. (© Brian House. Photo: Brian House.)

References and Notes

Fred Moten, *In the Break: The Aesthetics of the Black Radical Tradition* (Philadelphia: University of Pennsylvania Press, 2003).

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3. I. Moodley, C.M. Sheridan, U. Kappelmeyer, and A. Akcil, "Environmentally sustainable acid mine drainage remediation," *Minerals Engineering* 126 (2018), pp. 208–209.

4. See Moten [1], p.70

5. Craig Sheridan and Kevin Harding, Edward Koller, and Antonio De Pretto, "A comparison of charcoal- and slag-based constructed wetlands for acid mine drainage remediation" in *Water SA* 39, No. 3 (2013), p. 370.

6.See Moten [1], p. 96.