NATURE Lab: Using Art as a Vehicle for Unconventional Science Practices in a Post-Industrial Neighborhood

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Abstract

STEAM is a buzzword in education today, but the recent addition of the "A" to the more-popular acronym STEM tends to characterize art as secondary to math and science. In order to explore an environment where the dichotomy is flipped, I conducted 18 weeks of participant observation at The Sanctuary for Independent Media in North Troy, NY, specifically as a part of their science initiative, NATURE Lab. The Sanctuary is a community organization led mostly by artists and supported by volunteers who provide documentary showings, concerts, potlucks, lectures, and other community events. In my ethnographic observation, a pattern of unconventional science practices as framed by and supported through art emerged, particularly with regards to rewilding/urban/ruderal ecologies, biohacking, and environmentally oriented citizen science. This deliberate use of art and artistic critique to engage everyday citizens with science provided a model for increasing science literacy and democratizing science practices, an indispensable act in the age of American climate denialism and increasing educational stratification. I will use four specific examples to show how NATURE Lab participants have used art to promote neglected or inaccessible scientific practices to the inhabitants of a post-industrial neighborhood.

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Introduction

The arts and sciences have a colorful history of intersection and overlap. Both are considered hallmarks of an accomplished civilization, and both have undeniably contributed to an enriched human experience. But despite this universal predisposition, art and science are often perceived as the products of solitary creative genius. Both realms have, in recent history, attempted to put to rest this myth of individual achievement and have begun to highlight the role of collaboration of artists with artists and scientists with scientists (Bennis et al. 2007).

But what about the cross-pollination that occurs between these two seemingly discrete territories? A careful eye will reveal that the two are not so discrete after all. Take the example of famous artist/scientists, such as Leonardo da Vinci, or the role of models in crafting our understanding of the universe, or the beauty of nature as captured by zoological photographers. Indeed, the work of artists has often served as the foundation for modern scientific discoveries, such as in the case of the botanical illustrations which helped support Darwin's observations of morphological similarities in plants (Smith 2006), or the creation of intricate brass objects with metallurgy which undergirded today's knowledge of the elements.

Science has a rich history of co-opting art to support the claims of scientists, but the role of art in relation to science is not limited to passive appropriation. It's important to remember that art likely preceded science as a means of persuasion, and remains more effective at swaying hearts and minds in many arenas to this day. That means it's no surprise that The Sanctuary for Independent Media, an organization that promotes activism, community organizing, and, of course, independent media, has embraced art as one of its core values.

Protest art and activist art has a varied and well-studied history (Lippard 1984), but what about the use of art to promote unconventional science and science practices? I define unconventional science as science that does not rely upon the reigning hierarchies of contemporary academic science, and "science practices" as any practice that involves the scientific method regardless of the practitioner's identity. Using art to this end is where The Sanctuary excels, especially in its environmental justice and science literacy-oriented program, NATURE Lab. NATURE Lab is a center for STEAM, the popular acronym for science, technology, engineering, arts, and mathematics, but dabbles more specifically in bioart, biohacking, citizen science, and urban ecology. Mainstream science may consider some of these movements rather "fringe" (Bennett et al.

2009, Oliviera-Santos 2010), and the occasional insistence that the "A" in STEAM stands for agriculture (Lerum, 3/6/2018) demonstrates the reluctance that some bear towards including art in an ostensibly objective realm, but the need for collaboration between two seemingly separate worlds has only become clearer in our increasingly technical world.

These unconventional science practices – ruderal ecologies/urban ecology/rewilding, biohacking, and citizen science – are independent in a way that aligns wonderfully with The Sanctuary's commitment to independent media and activism. Of course, a community that is better acquainted to a diet of art and activism might not be terribly open or even well-equipped to understand such concepts, but the participants at The Sanctuary's NATURE Lab know how to "speak their language." By studying four specific examples, I will show how NATURE Lab participants have used art to promote neglected or inaccessible scientific practices to the inhabitants of a post-industrial neighborhood.

Methodology

Alongside board member Kathy High and artist/volunteer Ellie Irons, I contributed approximately 2 hours per week of participant observation in order to distill the role of citizen science and biological/ecological concepts at The Sanctuary for Independent Media.

The Sanctuary for Independent Media is a 501(c)(3) registered under the name "Media Alliance." The original Media Alliance was founded in 1977, although it did not find its home in North Troy until 2005. It is currently run by a six-member board, with only two paid staff and scores of volunteers, and is funded by numerous small contributions and several larger ones, from supporters such as the NY State Council on the Arts, the Andy Warhol Foundation for the Visual Arts, and the Community Foundation, among others. The Sanctuary has a particular focus on interdisciplinary art and its role in fostering healthy democracy through community projects, community gardens, activism, and more.

The Sanctuary's main building is a renovated church located in North Troy, a historically economically depressed area. Once one of the wealthiest cities in the United States in the 1800s, the city of Troy was hit hard by industrial decline, with its population peaking in 1910. Today, Rensselaer Polytechnic Institute (RPI), the local engineering school, is the largest private employer in Troy. These factors impact the composition of the community at The Sanctuary, with volunteers coming from RPI in the form of students and scholars but also from the surrounding area.

The Sanctuary's science program, NATURE Lab, stands for "North Troy Art, Technology and Urban Research in Ecology," and has existed as

an amalgam of events and workshops for about 7 years. As of 2014, NATURE Lab acquired a residential building across the street from The Sanctuary which operates as a gallery and has weekly open hours, mediated by Ellie Irons. In addition to attending these open hours, I also participated at all fundraising meets and also official events, such as the Seedy Social seed swap and the weekend-long Ruderal Ecologies Symposium.

During these events, I would take notes by hand in a notebook, sometimes in the presence of the subjects during appropriate times (such as when others were taking notes) and sometimes more inconspicuously. I would then expand these notes into more detailed notes on my computer. There was only one instance in which I explicitly conducted an interview; it was with Ellie Irons on the topic of the Next Epoch Seed Library (NESL), and the only time I typed my notes directly into a word processing program. For the most part, my observation was limited to Ellie, her assistant, and whoever would show up at the NATURE Lab open hours. There were very few instances in which my interactions were with people who were not long-time Sanctuary volunteers. Due to the restriction of my subjects and lack of in-depth interviews, many of my observations are only skimming the surface of the relationship of North Troy locals to the Sanctuary and NATURE Lab. However, I still managed to observe many fascinating interactions, and parenthetical citations can be found marking the date of each entry referenced.

Case 1: The Next Epoch Seed Library - Seedy and Weedy

An examination of the use of performative arts and installations to raise awareness of environmental issues.

The individual I spent the most time with in my participant observation was PhD student Ellie Irons, who was studying under Kathy High and tended the NATURE Lab open hours with the help of an intern from a local high school. Irons would use her time at the open hours to maintain the Next Epoch Seed Library (NESL), a community project/art exhibit that she ran with co-creator Anne Percoco. Irons was sympathetic to the fact that her project's concept was not immediately intuitive (Lerum, 1/23/2018). While most modern seed repositories, such as the Svalbard Global Seed Vault, focus on organisms of agricultural import, the NESL is comprised mainly of weeds, or, as Irons prefers to call them, "spontaneous urban plants" (Lerum, 3/27/2018).

If weeds, often considered by mainstream ecologists as "invasive species," are already so successful, why does the NESL collect their seeds? This is where the "library" part of NESL becomes important.

Irons considers herself a proponent of rewilding, often citing Emma Marris's Rambunctious Garden wherein humans are reimagined as environmental stewards rather than guilty parties who must restore ever-shifting ecosystems back to an arbitrary time period (Marris 2011). Of course, Irons recognizes that humans are culpable for the crime of climate change--in fact, the more practical, scientific side of the NESL is the hope that rewilded "weeds" which are well-adapted to urban environments will provide future benefits for humans to reap when less hardy plants go extinct. For this reason, participants are encouraged to take as well as send in seeds from the seed library.

NATURE Lab provided a platform for this controversial seed exchange at the February, 18th Seedy Social. Attended predominantly by gardeners, Irons wasn't the only one with a "seedy" story. One woman boasted of smuggling tomato seeds from Serbia into the United States, a disturbance of anti-invasive laws considered anathema by contemporary environmental sciences.

Although Irons was the de facto host of the seed swapping event, her art project got very little air time--in fact, her explanation was largely talked over by attendees still tittering about heirloom tomatoes. Despite this, many people still took the evening primrose seeds Irons was distributing, perhaps persuaded by the tall, beautiful dried stalks of the plant that gated the gallery entrance. A later NATURE Lab workshop was spent painting the specimens, which were then used to adorn the wrought-iron banisters framing the staircase to the building (Lerum, 2/20/2018).

Most common gardeners confronted with Irons's weed-collecting practice respond with "not hostility, but concern," Irons reported (Lerum, 1/23/2018). Primary criticisms include the risk of misidentification, proliferation of invasive species, and the fear that the artists running it are "unprofessional," or playing with fire. Irons is sympathetic to their concerns; she religiously uploads difficult-to-identify specimens to iNaturalist, a field-identifying app, and a host of "citizen science" online forums for skill-sharing and identification (Lerum, 2/13/2018). She's also wont to emphasize the potential uses of seemingly useless plants. Each NESL seed packet is affixed with several icons to mark its potential uses (culinary, bioremediative, or otherwise), and Irons' knowledge of how to make the most of a plant is encyclopedic. One of her specialties is making paint--in her article, "Invasive Pigments and Feral Hues: A Handbook for

Painting With Weeds" (Irons, 2016), anyone can learn how to make vibrant magentas, viridian greens, and a myriad of yellows and blues from everyday backyard plants, seeds, berries, and roots. This is just one way that Irons' portfolio leveraged science to further art, a recurring theme in her artistic intervention.

Another key theme of the NESL is visibility and participation. Many workshops were spent handling soil, planting seeds, and making labels, infusing natural practices with scientific practices. For the first half of my observation at NATURE Lab, the classic brownstone gallery housed hundreds of plants under a grow light in a windowed nook, inviting passers-by as well as longing critters to gaze upon the leafy greens and incite curiosity about what was happening inside. The lights were eventually relegated to a back room due to burglary concerns (Lerum, 4/2/2018).

Still, Irons was determined--no matter how ostensibly inaccessible her work was to the public--to engage the community, in all facets of her artistic career. In her involvement with the Environmental Performance Agency, a jumpsuit emblazoned with the letters "EPA" was central to provoking conversation about climate science. In her Lawn (Re-)Disturbance Laboratory project, which involved digging up institutional lawns in order to uncover seeds sleeping dormant below, she costumed herself in a fluorescent safety vest and was sure to greet anyone who passed by as she sampled soil (Lerum, 4/17/2018). Orange signs with an artistic scrawl marked the places she had been, often with simple summaries of the experiments as well as contact information. All instructions on how to conduct the experiment are posted online, and it is this open-source ethic and theatrical flair that allowed Irons to toy with the concept of experts/lay people in the interest of educating all.

Irons' commitment to science literacy did not stop there. As part of the NATURE Lab bucket on WOOC 105.3 FM, she took it upon herself to explain science journals about biodiversity in populations of evening primrose--the same plant used to create the deep purple paint we used for the Seedy Social signs, and the decorative branches that lent a regal look to the gallery's doorway. Straining herself to explain the article in simple English, Irons explained her process of how she parses scientific journals and also illuminated the significance of the experiment's findings. In short? A greater genetic biodiversity within a monoculture (of evening primrose, for example) can have a domino effect on other aspects of biodiversity, such as promoting diverse symbiotic and commensal relationships with insects, contrary to the long-held belief that an

overrepresentation of weeds in an ecosystem stifles the number of niches provided (Cook-Patton 2011). Irons believed this to be especially relevant in the context of urban, or ruderal ecologies, where weeds are often the only plants which can survive the harsh conditions of asphalt and ruin.

Irons recruited me and a volunteer-intern from a local high school to design diagrams for an NESL pamphlet (Lerum, 1/30/2018). We were challenged to visualize ways to communicate the concept of genetic diversity in plants, and due to the limitations of our plant-drawing abilities, many of our sketches resembled textbook figures at best, anti-GMO propaganda at worst, with double helices twining ominously between leaves of evening primrose. However, Irons edited our ambitious sketches into her informational pamphlet and distributed them along with the seed samples of evening primrose at the Seedy Social, where context rendered them more appropriate-looking and were well-received.

While theories of Pleistocene rewilding or de-extinction in order to reverse climate change remain extremely controversial, spaces of urban opportunity remain an ecological blank slate. Of course, the term "blank slate" is incorrect as it implies a space devoid of life; anyone who has seen a dandelion growing out of the sidewalk or a pigeon stalk across the road knows that cities are ecosystems of their own. But many of these resilient organisms are rejected as pests or, of course, the derogatory "weed." In response to this, Irons' attitude appeared to be: "Better weeds than nothing." And this is an attitude that may have to shift to include non-urban spaces as well, as anthropogenic climate change drastically alters ecosystems around the world. In fact, as some the more delicate plants we depend on lose their ability to cope with heightened temperatures and volatile weather patterns, we may have to look to hardier species to fill these needs. Weeds are notoriously hardy--and they may be the future, according to Irons.

It's a tough pill to swallow for those who grew up straining their backs to weed the garden once a week, but it's a pragmatic approach to climate change and conservation science that no longer clings to an expiring, purist definition of "nature" (Lorimer 2015). But without the incorporation of art into the message, this concept may never have reached urban dwellers who would otherwise avoid a book about a "garden" since they may not see themselves as included in the demographic with access to gardens (although this is complicated by those who may have access to community gardens, as is the case with those who volunteer at the Sanctuary's garden, Collard City Growers). Irons has (successfully or unsuccessfully, it remains to be seen) provided a vision for the future and

expanded local science literacy through her paintings, installation art, and informational pamphlets by capitalizing on her status as artist to communicate scientific findings and encourage the community to be more scientifically engaged with their environment.

Case 2: From Biohacking to Bioart

An exploration of bioart as a tool for increasing inclusion and biological literacy.

Biohacking is a phenomenon which incites excitement, ambivalence, and enmity, depending on who you are. Generally defined as the use of biological experiments or lifestyle changes to "hack" one's body or environment, biohacking can include augmenting oneself surgically or pharmaceutically, monitoring biofeedback, or altering the biosphere. For some, it is considered a democratizing, liberating DIY outlet for maximizing one's health and productivity; for others, it is an inaccessible practice that endangers its users and others (Bennett 2009).

Like other forms of hacking, biohacking invokes an aspect of the "trickster" character (Nikitina 2012), familiar to the hacker culture usually associated with internet/computer science technology. NATURE Lab coordinator and renowned bioartist Kathy High definitely appeared to be embracing this trope as she considered the controversy of supplying NATURE Lab with DIY CRISPR kits during an equipment brainstorming session. CRISPR Cas-9 is a relatively new technology used to perform gene editing and is looked to by many as a tool for promising gene therapies. It was recently recognized as integral in the process of creating the twin genetically-modified babies in China, an act that was globally condemned. At first glance, this seems like an inappropriate technology to make accessible to the public, but due to the limitations of The Odin model kits, which provide a simple experiment on a non-pathogenic strain of E. coli, and the limitations of gene science itself, this was seen more as a fun way to stir up trouble and get people talking about the technology rather than a true biological hazard.

However, while The Sanctuary eventually did host a 3-day DIY CRISPR event in 2019, almost all mention of such controversial subjects went up in a puff of smoke during NATURE Lab's crowdfunding push (Lerum, 3/6/2018).

This paralleled a shift in support for NATURE Lab's name. NATURE Lab stands for North Troy Art, Technology, and Urban Ecology Lab, a somewhat clunky acronym, but one that carefully covers all the bases for

the program's initiatives. What became the Environmental Education Center was originally conceived of as a citizen/community life sciences lab, which was to be incorporated in the name. In fact, under High's endorsement, the lab was also planned to house a Biohacker Academy course, characterizing the establishment as a DIY biohacker/makerspace.

However, due to various systemic and social barriers, biohacking is not exactly the most accessible hobby, especially for those inhabiting an underserved, historically impoverished neighborhood (Adam 2003). Biohacking is most often embraced by higher-income, upper-educated tech professionals, often with the intent of improving themselves in order to expand productivity, and thus profitability (Wexler 2017). While NATURE Lab's flavor of biohacking would likely not resemble mainstream biohacking of this sort, it still carries the connotation of being for white, male, mad geniuses. This demographic better reflects the nearby business incubator/makerspace Tech Valley Center of Gravity, which caters to an ecology of Rensselaer Polytechnic Institute students and alumni. In an attempt to avoid getting lumped in with this relatively exclusive organization, NATURE Lab changed its working title from "Troy Science Hub" (another trickster feature in reference to the journal pirating website, SciHub [Lerum, 3/6/2018], but also a reference to open-source CS host GitHub) to the NATURE Lab Environmental Education Center. Along with this shift in language came another: the subbing of "biohacking" for "bioart" (Lerum, 3/6/2018).

Bioart is still somewhat cosmopolitan and hence exclusive, but it is able to leverage its universal component--art--in a way that biohacking (seeing as hacking remains an insular practice) can't. Take the example of Shu Lea Cheang's presentation at the NATURE Lab Fundraising Kickoff event (Lerum, 3/21/2018).

Shu Lea Cheang was inducting NATURE Lab into her art collective founded around mushrooms, called The Mycelium Network Society. In her presentation, she recruited Trae, The Sanctuary's youngest intern, to read the description written on her website for her project. The audience laughed as Trae called it quits halfway through, struggling with phrases like "collective fungal consciousness" and "post-internet mudland." However, the laughter was as sympathetic as it was at his expense: while many of the attendees were themselves artists, and others still had connections to biology, it seemed few had direct contact with art from an academic perspective, especially bioart. The laughter was just as self-deprecating when Cheang showed a trailer for her most recent film, Fluidø, which seemed to baffle with its concepts of the necropolitical and

literally masturbatory scenes with homoerotic sprays of fluorescent semen (Cheang, 2017). Despite all of this, the conversation that ensued afterwards included an intermingling of scientists and traditional artists, both of whom were intellectually invigorated and some of whom reported ideas for new art projects inspired by what they had seen.

A long-time Sanctuary member remarked on how impressive it was that NATURE Lab accomplished the combination of such eclectic interests. "We didn't really have science stuff until Kathy got here," he said, but he seemed appreciative of the addition, and especially the diverse community that its inclusion fostered.

While NATURE Lab does not necessarily promote biohacking as a value, it does explicitly promote the de-hierarchization of science and democratization of its practices (Lerum, 3/6/2018). These values are aligned with biohacking in spirit (Sanchez 2014). And biohacking has not disappeared entirely from the literature--the fundraiser scripts included a description of NATURE Lab's make-your-own-Advil workshop, which, while not explicitly biohacking, clearly connects to biohacking's anti-Big Pharma code of conduct. These biohacking workshops are nestled amongst a selection of other bioart programs, including ones to do with fermentation, slime mold, and biological photography.

Art is clearly something the Sanctuary and its members, volunteers, and visitors value and listen to (2/13/2018). Although the medium itself may seem a bit obtuse to the uninitiated (take one look at the WOOC 105.3 FM interview of bioartists Marta de Menezes and Dalila Honorato by a self-proclaimed non-science person), the medium can be just as important as the message, and this is what makes art art (Winterson 2013). Thus, consciously or unconsciously, The Sanctuary's promotion of bioart has curbed the exclusionary connotations of biohacking and expanded its commitment to non-hierarchical, democratic, and independent science practices in collaboration with and undergirded by art.

Case 3: How EJ Art Prompts Citizen Science

A reflection on the ability of art to transcend language and promote community engagement with the environment.

Environmental justice (EJ) is defined by the EPA as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." While this has no clear connection with art, The Sanctuary's

primary method of supporting EJ, as it is called, parallels the wider movement in its embracing of art as communication.

A locally famous example has to do with signs created by The Sanctuary's "Youth Change Makers" in their Uptown Summer program, which were embedded in cement near the Hudson River at the toxic brownfield at Ingalls Avenue in Troy (Lerum, 2/13/2018). While some of these were fairly straightforward in communicating the risk associated with the polychlorinated biphenyl (PCB) and mercury contamination in the soil, water, and fish, others had a more artistic flair. One sign read "Caution: national greed," while another depicted a fish with the words "I CAN'T BREATHE" in urgent lettering. The latter slogan hits even harder when one considers the fact that these signs were installed in August of 2014, just one month after the killing of Eric Garner at the hands of police. The racial injustice of his murder parallels the racialized environmental injustice of contamination in North Troy, which is occupied predominantly by lower income people of color. While the signs were eventually taken down by the City of Troy, at least some citizens got informed due to the bright warnings of danger written in both English and Spanish.

The success of this program inspired The Sanctuary to begin developing its Environmental Education Campus, a collection of ecologically interesting and ruderal sites that could be used to show the effects of living in a post-industrial urban habitat as well as ways to improve the environment, through community gardening and bioremediation (otherwise known as phytoremediation). Indeed, The Sanctuary has begun promoting the use of sunflowers and other plants (some provided by Ellie Irons' Next Epoch Seed Library) for removal of heavy metal contamination, such as lead, and will continue to do so as it officially opens up NATURE Lab's Environmental Education Center, along with the accompanying lot which will be used for the testing and refining of such experiments.

Another example of the connection between environmental justice and art is one that keynote speaker Aaron Mair shared at The Sanctuary's first annual Ruderal Ecologies Symposium. Aaron Mair is an ex-president of the Sierra Club, an environmentalist organization, and was instrumental in the shutdown of the Albany New York Solid Waste Energy Recovery System or ANSWERS incinerator, which plagued the surrounding predominantly black population with environmental asthma and upper respiratory infections, as well as a host of other pollution-related problems (Lerum, 4/14/2018). In order to promote awareness of the link between the

population's declining health and the government-owner incinerator, Mair commissioned an artist to depict a pregnant woman holding a child and an umbrella, with each spoke of the umbrella labeled with how much money they needed to raise with the incinerator and its accompanying smoke looming malevolently in the background. Mair lauded the simple effectiveness of art to communicate the scope of environmental racism, and chided the Sanctuary for its use of "academic" language by choosing to embrace the phrase "ruderal ecologies," which is, they admitted, not a term that is commonly used or known. Even beyond that, he emphasized the need to communicate to individuals who are partly or wholly illiterate, as they are especially likely to trust the word of "experts" who may not have their best interests at heart (Lerum, 4/14/2018). Art, with its ability to transcend language, can communicate environmental dangers as seen here and in the example of the Ingalls Avenue signs.

The theory goes that as citizens become more aware of contaminants and injustices in their community, the more inclined they are to try to study and gather information within the community, and to provide their experiential knowledge to interested professionals (Paulos 2008). This appeared to be true in the case of the Flint, MI water crisis, and may apply to other environmental tragedies as well. Indeed, The Sanctuary's stream sampling activities have sparked an interest in the water health of the surrounding area, as well as the tests for antibiotic-resistant bacteria in the Hudson River. But it's the art rather than the science that empowers individuals and reminds them of the ability they have to make a difference in their community; in the case of the Ingalls Avenue signs, participants were given a voice. At NATURE Lab open hours, it was Brandon Ballengée's Echoes of Lock One photographs which drew in new visitors and increased their awareness of pollution in the river (Lerum, 2/20/2018). Art speaks to people, and allows them to speak, in ways that science can't.

Although artists, especially those from an academic background, are often perceived as inaccessible, the perceived gap between the average person and an artist is much smaller than the gap between the common person and a scientist. While potentially anyone can create art regardless of education or economic background, or access it through music or craft, science remains stratified due to the constraints of higher education. It's important to note, however, that this hasn't always been the case; in the age of the farmer-scientist, all that may have been required was a will to observe and collect data. Since then, the Victorian image of the traveling naturalist introduced a requirement of wealth into the picture, and beyond that, the modern scientist has been squirreled away into the confines of a

university setting. Citizen science is one method of upsetting that model, and art is the lingua franca that can get people involved in it.

Troy is an especially prime environment for this sort of artistic intervention. A North Troy volunteer for the WOOC jazz radio program was attending the celebration party for the NATURE Lab, presumably because the time and room it was in (outside the WOOC studio) overlapped with his radio duties, possibly exposing him to a part of The Sanctuary he may have never otherwise interacted with. He asked me if I thought that if NATURE Lab existed in Hoosick Falls, locals would have discovered the PFCs (perfluorinated compounds, included PFOA and PFOS) contaminating their water earlier (Lerum, 4/26/2018). I said it was a distinct possibility. We also discussed the ways in which the local college, Rensselaer Polytechnic Institute, wasn't very "welcoming" to the local Troy community. I provided my hope that NATURE Lab would serve as a proxy for the role of a university as a community resource, a place where lay people could bring their inquiries and oddities to "experts" who could help identify specimens, answer questions about science, and provide a living, learning environment which would not implicitly deny attention on the basis of income or race. It's reflective of The Sanctuary's unique achievement in bringing together people of all stripes and supportive of the bridge that art creates for science that this man "discovered" NATURE Lab through jazz music, showing further the ways that art, environmental justice, and citizen science create an emergent ecology that roughly characterize the form of a post-industrial community.

Case 4: The Ruderal Ecologies Symposium

Takeaways from The Sanctuary for Independent Media's debut Ruderal Ecologies Symposium.

Between all of the connections that link art, environmental justice, and science, it's no wonder that the Dear Climate posters were bestsellers at the Ruderal Ecologies Symposium art auction. These agitprop depictions of plants, animals, and weather phenomena with provocative slogans such as "Climate Change: Will It Make Me Look Fat?" and "Let Nature Be Your Undertaker; Expose Yourself" (along with the morbid image of a vulture) were created by several artists with the intent of helping their consumers "meet, befriend, and become climate change."

The Ruderal Ecologies Symposium, in some ways, served as a sort of glimpse into NATURE Lab's future. Replete with a host of fascinating

speakers, complemented by a series of hands-on workshops, the symposium helped communicate both the need for and the benefit of creating a community environmental education lab in Troy. One important aspect of its execution was the integration of artists, scientists, and community organizers as authoritative voices. While some of the panelists felt very strongly that they belonged to one group and not another, most seemed to embrace the mosaic nature of their roles and leverage their unique experiences to break down the walls between lay person and expert, artist and scientist, contributor and leader. This parallels the democratizing role of citizen science, art, and, to a lesser extent, biohacking.

Indeed, Aaron Mair's closing speech seemed to resonate with the audience when he commented on the resourcefulness of artists, and how communities should learn to take advantage of that resourcefulness. "Artists hack resources," Mair said, quoting one of the earlier panelists, and upon hearing that line, my memory flashed back to weeks of finding unusual but cost-effective ways of making things alongside Ellie Irons at the Next Epoch Seed Library, as well as the months spent planning for the Environmental Education Center. It appeared that Irons was nodding at this quote too.

The Ruderal Ecologies Symposium was not only a preview for the Environmental Education Center, but a sample of what other communities could accomplish with this artist/scientist collaboration on their home turf. The Sanctuary for Independent Media prides itself on being a model for other organizations, and NATURE Lab is no exception. Even though The Sanctuary often has an obvious political leaning and explicit politics in its activism, its approach through art allows outsiders to engage with a greater degree of trust as opposed to politics on its own, which generally seems to have hidden motives when compared to the outright genuineness of art activism and protest. The three-day symposium was a great success, and NATURE Lab exceeded its crowdfunding goal by the end of the weekend. The next steps for the Sanctuary are to renovate the Troy Land Bank building they recently purchased, and then prepare and open the NATURE Lab Environmental Education Center to the public, implementing new opportunities for bioart, biohacking, rewilding workshops, and environmental empowerment in the post-industrial neighborhood of North Troy.

Conclusion

Discussions of emergent, non-traditional, and unconventional science practices are usually confined within insular groups, but The Sanctuary for Independent Media's NATURE Lab has rendered the conversation on rewilding, biohacking, and citizen science public. Although a large fraction of actors behind NATURE Lab's emergence have a background firmly rooted in academia (Lerum, 1/30/2018), they have made their goal to create a space that increases scientific literacy and opens up science--a skill that, like art, everyone as a human being regardless of background has a claim to--to the community.

Participants in NATURE Lab may still harbor skepticism towards the ideas being expressed by some leaders within the program, but the conflict is approached on fundamentally different terms than with traditional science. For example, the public is usually removed from the whims of those cloistered in an "ivory tower" and have no opportunity to engage in dialogue with the actors making scientific decisions. But at NATURE Lab, citizens can approach scientific actors on neutral territory, and engage in one-to-one conversations to express concerns, make suggestions, and to ask questions (Lerum, 2/20/2018). This is a radically important enterprise, and my reasoning behind this can be explained by an analogous situation concerning the institution of journalism. As the media has consolidated into only six corporations that own 90% of all content, a fact cited at the Ruderal Ecologies Symposium as the exigence for The Sanctuary for Independent Media, mistrust in the institution of journalism has exploded into a democracy-threatening malaise (a malaise which is not helped by an administration determined to exacerbate said mistrust). This can be attributed to, in part, the disruption of local news enterprises, leading to thousands of local newspapers and other publications to shut down. As a result, nearly all media is produced behind closed doors, invisible to the public. It is much easier to mistrust an institution which does not have a face. Columbia Journalism Review editor-in-chief Kyle Pope considers this to be the top reason for the proliferation of "fake news" abuses hurtled at otherwise perfectly respectable publications. The same kind of plague of invisibility hurts the institution of science as well, which is further twisted by the media. Therefore, The Sanctuary has endeavored to make the practice of science visible and accessible and therefore trustworthy, in the same way it does with its activism and media. This is especially important in an age where climate change denialism is considered an acceptable view, and science has been politicized to the point of corruption in the eyes of the public.

Art is the ideal vehicle for softening the public to new ideas about science and media. Art encourages creativity, disruption, and thinking outside the box. Artistic critique can also be used to make political statements, just as the Next Epoch Seed Library critiques modern conservation science, biohacking critiques the monopolization of biotechnology, and environmentalist art critiques the unequal distribution of destructive climate effects across modalities of class and race. The Sanctuary excels at providing a platform for proponents of these movements, and also an audience to receive them. Through this radical act, The Sanctuary provides a model for salvaging the relationship between the everyday citizen and institutions of higher learning, as well as for inviting dialogue on unconventional science practices between experts and amateurs as facilitated by art.

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