Conclusion. Sensing Citizens: How to Collectivize Experience

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Conclusion

SENSING CITIZENS

How to Collectivize Experience

What we were discussing was the idea of a world growing not integrally but piecemeal by the contributions of its several parts. Take the hypothesis seriously and as a live one. Suppose that the world's author put the case to you before creation, saying: "I am going to make a world not certain to be saved, a world the perfection of which shall be conditional merely, the condition being that each several agent does its own 'level best.' I offer you the chance of taking part in such a world. Its safety, you see, is unwarranted. It is a real adventure, with real danger, yet it may win through. It is a social scheme of co-operative work genuinely to be done. Will you join the procession? Will you trust yourself and trust the other agents enough to face the risk?"

William James, *Pragmatism*

Throughout this study, I have attended to how sensing technologies activate the "citizen" as a political entity. I have considered how these political subjects variously converge and diverge in struggles to monitor environments. Multiple modes of citizenship circulate throughout these struggles, including the atmospheric, the instrumental, the speculative, the data-oriented, the multiple, and the sensing. Yet many more citizens surface here, from breathing citizens to contradictory citizens, digital citizens, good citizens, insurgent citizens, neoliberal citizens, planetary citizens, and scientific citizens. Indeed, many of these citizens proliferate in each chapter when discussing how citizen sensing is put to work.

Rather than encountering these citizens as variations of human subjects, however, this research offers a more pluralistic proposal for *citizens of worlds*. This concept attends to how subjects and worlds are co-constituted. By monitoring environmental problems such as air pollution, citizens operate as distributed and collective sensors that tune in to and act upon environmental problems. Polluted environments also make demands on how subjects experience, respond to, and act on these worlds. Political subjects and collectives form along with these worlds of experience.[1] Citizens and worlds are in the making.

In the context of this discussion on environmental sensing and air pollution, I especially consider how citizens of worlds signal conditions of breathability. The breathability under discussion here especially pertains to air pollution, as a residue from the ongoing extraction and consumption of fossil fuels. The construction of pipelines that began this study, as well as the fracked gas, the incessant traffic, and the multiple other polluting industries and activities discussed here, contribute to toxic air and a warming planet. As one of the most significant environmental and health problems globally, air pollution contributes to nearly nine million deaths every year, with many more people living with chronic health problems due to air pollution. It also contributes to clogged atmospheres that affect multiple more-than-human organisms.

While air is often described as something held in common, and breathing is frequently described as a universal condition of human life, the actual constrictions and differential compositions of atmospheres can be elided or overlooked in gestures toward universality. Struggles for breathability indicate how air and air pollution are unevenly distributed. Toxic atmospheres are unequally experienced and endured. Bodies are diversely affected by the conditions in which they endure or expire. Such atmospheres can contribute to practices of "combat breathing," a concept from Frantz Fanon that has informed numerous writers who work through the unbreathability of social inequality, environmental injustice, racism, colonialism, and contradictory citizenships to propose ways of breathing otherwise.[2]

This discussion of breathability is not only a reference to the literal (or even metaphoric) quality and condition of air and atmospheres; even more, it is an analysis of social, political, environmental, and more-than-human exchanges that make citizens and worlds. Such a concept orients inquiry toward how citizens and worlds form, gather strength, and dissipate through ongoing struggles for breathability. Although breathing is a collective endeavor, it is differentially experienced.[3] Breathing here is not simply a routine inhalation and exhalation of air. To suggest otherwise runs the risk of reverting to a "one-world world" that would overlook the struggles of those who are fighting for more breathable worlds. Industries are entitled to pollute the air, wealthy people have greater privilege to directly or indirectly emit and avoid damaging pollutants, and poorer people bear the injustices of living next to polluting industries and transport infrastructure. Breathing is not guaranteed for all, and possibilities to be and become citizens vary significantly within more or less expansive or constricting worlds.[4]

In this way, the uneven distribution and experience of air pollution can highlight environmental injustices in the sacrifice zones of rural industrial areas, urban areas experiencing poverty and gentrification, and financial centers where the exchanges of communities and more-than-humans can diminish under the weight of ongoing urban development. To discuss these diverse conditions together is

Figure C.1. Dalmain Primary School green screen and air-quality sign; Dustbox installed as part of the AirKit project in Forest Hill, London, 2020. Photographs by Citizen Sense.

not to flatten them into a single record of air pollution and its impacts. Instead, such an approach demonstrates how these worlds form through struggles and differential registers of experience.

To grapple with the lived experiences of these struggles, this study has developed the concept and practice of open-air instrumentalisms. Open-air instrumentalisms orient toward the how-to as a mode of collective inquiry, which further forms an organizing thread throughout this text. This inquiry asks: How is it possible to sense the air? How do different political encounters and relations struggle against environmental injustice? What citizens and citizenships materialize here? And how might breathable worlds be made? The toolkit forms an initial invitation for how to operationalize citizen sensing through these modes of inquiry. The toolkit intervals that punctuate this text document how we assembled various sensors and components to test and query.

Yet as *Citizens of Worlds* demonstrates, such instructional approaches quickly become open-ended practices for how to make worlds, and how to make worlds matter. They do not, as James suggests in the epigraph to this conclusion, lead to certain outcomes. But they could lead to more reciprocal ways of working together, as crucial components of democratic exchange and breathability. By moving into the open air, citizen-sensing practices are activated as they encounter environmental problems.[5] In the process, the citizens and citizenships that materialize are neither as singular nor as singularly effective as citizen-sensing scripts might ordinarily propose. Instead, different registers of political engagement surface through these struggles for more breathable worlds.

The three case studies that I discuss in this book describe how communities, Citizen Sense researchers, and many other collaborators have found ways to cooperate and undertake collective inquiry. We were, in different ways, sensing citizens who attempted to work through experiences of air pollution, environmental sensors, digital platforms, citizen data, planning documents, governance structures, community meetings, atmospheric science, health conditions, and much more. We researched the multiple ways people monitor and observe environmental problems, including how to collect and analyze data on air pollution and emissions sources, how to mobilize observations, how to lobby industry and governments to take action, and how to engage in collaborations and protests as different worlds in the making collide with inequalities and power imbalances.

The "citizen" in "citizen sensing" might seem to confer certain political and technical skills abstractly and evenly on all users of these technologies. While exclusions and inequalities might ordinarily pertain to the nation-state as the site of (differential) belonging and privilege, in the realm of technological citizenship these conditions might have more to do with "capacities" of citizens, not necessarily as a form of national belonging or grouping, but more as an ability to

contribute. But this is potentially a one-world world way of understanding citizenship. It suggests there is one correct register of capacity and contribution where certain subjects can perform in these registers. These conditions could determine who can and cannot be or become a citizen within a universal technopolitical milieu. As the NoDAPL protectors and pilots discussed in the Introduction demonstrate, capacity can involve pushing technology to its limits to appropriate and invert the usual means of using it, especially when attempting to materialize lived experiences and worlds. These capacities might not be recognized as legitimate or even legal forms of participation. However, such practices can generate distinct political and technological engagements that challenge environmental destruction and injustice.

While technologists are busily appending "citizen" to digital devices, these technologies turn out to be neither so clearly open nor participatory. Instead, they can generate power imbalances of all sorts.[6] The citizen is often an assumed figure within citizen science, citizen sensing, and related forms of public engagement, which mobilize the term "citizen" to suggest that a practice or technology might be equally available to everyone, or even spark democratic modes of participation. However, very different political engagements can form along with these devices. Even those "citizens" who follow the instructions and generate legible evidentiary outputs might find that their practices and findings are not recognized. Digital sensing technologies and the citizenship advantages they are meant to confer could reproduce or amplify existing struggles over citizenship and legitimacy. Devices shift and transform with the environmental problems people attempt to address within and through circuits of politics and power. In this sense, the citizenly promise of sensors does not equally or so readily materialize as instant guarantors of engagement.

Environmental sensing toolkits could activate particular technological expressions of citizenship and articulate distinct affiliations and exchanges that support the formation of certain political subjects and not others. However, *Citizens of Worlds* seeks to redirect the focus on citizenship less toward the agency of a singular human subject, or the more neutral registers of digital participation. Instead, it orients more toward the distributions of effect and effectiveness formed in collective struggles for breathable worlds. Such a focus attends to the relations, processes, multiple entities, environments, politics, and ontologies that activate and sustain citizens and worlds. These citizens and worlds come into being, proliferate, subside, and are erased. Because they are in the making, they do not fit neatly into an official genealogy of citizenship. In this sense, the struggle for breathable worlds is often undertaken by unauthorized participants, those whose struggle to breathe is a struggle not just to have their voices heard but also to make their worlds matter.

This citizens-of-worlds approach to citizen sensing deliberately engages with these uneven political, technical, and social registers of environmental monitoring. It considers not a limited range of legitimate or capable actors, practices, and devices, but instead attends to pluralistic ways of engaging with, observing, witnessing, documenting, communicating, and acting on environmental problems. Here citizens are less stable and universal individuals with settled rights and responsibilities and more flickering figures that shape-shift through changing relations. Rather than neatly bounding the citizen, it might be possible to unravel the loose threads of citizenship to demonstrate how it sprawls into an unruly composition that is more characteristic of the goings-on of democratic life.

As a concept, "citizens of worlds" seeks to create an approach to citizenship as a register of collective experience. This approach looks at the concrete articulations of citizens and citizenship that occur, and how these variously challenge and remake political subjects and engagement toward more breathable conditions. Instead of singularly defining *the* citizen, such an approach travels with the conditions, communities, and feelings that settle into citizenly engagements. By attending to the struggles across different citizenship practices, I have sought to trace out and inhabit the open-ended and restrictive forms of citizenship mobilized through citizen sensing as an emerging form of political engagement with environmental problems. At the same time, when taking up a project of attending to proliferations, it is always necessary to address how some forms of citizenship proliferate to the detriment of others.[7]

Sensing citizens form not just as they attempt to make sense of worlds under threat and suffering from environmental destruction. They also materialize through practices that attempt to operationalize sensing toolkits to generate less extractive relations—with technology, environments, and other entities. Technology is more than an artifact. It extends to and encompasses the entities, relations, and expanded milieus that inform how technics materialize and unfold. This means that citizen-sensing devices do not automatically generate intended political effects. Instead, they are put to work in ways that co-constitute citizens, worlds, and breathability in searching after political possibility. By seeing technologies as extended relations and fields of influence, it could be possible to create more constructive technological engagements that attend to pluralistic citizens, relations, milieus, sociality, and worlds in the making. Unlike in James's thought experiment, there is not one author of one world that materializes here. However, worlds involve piecemeal projects that arise through multiple contributions and experiences. The commitment to build worlds through cooperative work and resonant experiences is the generative spark that binds them together. Sense-making then becomes critical to the doing and sustaining of democratic worlds.[8] This is how you might collectivize experience.

Figure C.2. Dustboxes, a particulate-matter sensor for monitoring air quality developed by Citizen Sense. Photograph by Citizen Sense.