# The infrastructural relation

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**Abstract**

Through public transit, wastewater reclamation, air-conditioning systems, and public art in Singapore, this thesis considers and furnishes terms for approaching infrastructure and subjectivity. This project is in dialogue with the "infrastructural turn" across disciplines in the humanities and, more particularly, with this turn in media and communication studies. Across an introduction, two chapters, and a conclusion, I argue for the possibility of describing an *infrastructural relation* as the site where infrastructural failure is negotiated. Infrastructures, as that which attempt to sublimate, capture, or disavow failure, *require* this failure in order to "become" infrastructural, to be activated as "infrastructures." Two further claims are made on the part of infrastructural failure: first, it is the notion of failure that makes questions of indeterminacy and agency thinkable; second, failure is something *felt*, an affect implicated in psychic life. The introduction pursues this question of failure through clarifying the terms from which this thesis operates: basic questions of what it means to study infrastructure, of determinism and determination, of agency, and of the role that "the subject" plays are explored. The two chapters that follow contain two case studies that expand on the forms taken by the relationship between affect, infrastructure, and the subject. The first chapter locates "base affect" in the infrastructure of NEWater, the brand name for drinkable reclaimed wastewater, while the second chapter suggests that feelings of fear and disgust are central to the way air-conditioning systems condense and intertwine questions of modernity, citizenship, heat, and subjectivity. This thesis concludes by offering some reflections on "the infrastructural relation," politics, and change.

**Résumé**

À travers le transport en commun, la récupération des eaux usées, les systèmes de climatisation et l'art public à Singapour, ce mémoire considère et fournit des termes pour aborder les infrastructures et la subjectivité. Ce projet est en dialogue avec le « tournant infrastructurel » qui touche toutes les disciplines des sciences humaines et, plus particulièrement, avec ce tournant dans les études des médias et de la communication. À travers une introduction, deux chapitres et une conclusion, je défends la possibilité de décrire une *relation infrastructurelle* comme le lieu où l'échec infrastructurel est négocié. Les infrastructures, en tant que ce qui tente de sublimer, de capturer ou de désavouer l'échec, *ont besoin de* cet échec pour « devenir » infrastructurelles, pour être activées en tant qu'« infrastructures ». Deux autres affirmations sont avancées à propos de l'échec des infrastructures : premièrement, la notion d'échec rend pensables les questions d'indétermination et d'agence ; deuxièmement, l'échec est quelque chose de *ressenti*, un affect impliqué dans la vie psychique. L'introduction poursuit cette question de l'échec en clarifiant les termes à partir desquels ce mémoire opère : les questions fondamentales de ce que signifie étudier l'infrastructure, du déterminisme et de la détermination, de l'action et du rôle que joue « le sujet » sont explorées. Les deux chapitres qui suivent contiennent deux études de cas qui développent les formes prises par la relation entre l'affect, l'infrastructure et le sujet. Le premier chapitre situe « l'affect de base » dans l'infrastructure de NEWater, la marque d'eaux usées potables recyclées et le deuxième chapitre suggère que les sentiments de peur et de dégoût sont au cœur de la manière dont les systèmes la climatisation condensent et entremêlent les questions de modernité, de citoyenneté, la chaleur et la subjectivité. Ce mémoire conclut en proposant quelques réflexions sur « la relation infrastructurelle », la politique et le changement.

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## Contribution of Author Statement

I am the sole author of this thesis. I organized, wrote, and revised the arguments, analyses, and conclusions of each chapter.

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## Introduction

## Infrastructure and the Non-Infrastructural

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This train is so shiny, clean and fast. Like this country,
I'm sure it'll never break down. Outside the window,
the city smashes into itself. So many new buildings;
so many flats nicer than mine. Commuters look busy
all the time. I'm not busy, but even I tremble with the urge
to go. Being fast must mean that we're happy, successful,
free. I'll enjoy my freedom, or the air-conditioning,
while it lasts. I can get off at any station at any time.

—Cyril Wong, "My Grandmother Takes the M.R.T. for the First Time"


Figure 1. The M.R.T., pulling away, with flats reflected in the platform screen doors, Singapore, June 2024. Photo: Hui Wong.

**Feeling Infrastructural**

The poet Cyril Wong's "My Grandmother Takes the M.R.T. for the First Time" gives its readers what its title promises: an imagined narrative rendering of the internal monologue of Wong's—or perhaps anyone like him—grandmother as she boards the rapid transit train known colloquially by the initialism MRT (the Mass Rapid Transit system in Singapore).[1] The poem renders her experience with the transport infrastructure, but it does not take the form of a phenomenological account; the grandmother does not exactly "bracket" the ordinariness of the "natural attitude"—the attitude, given by the world, which naturalizes the way things are and makes them appear as uncomplicated reality—either to richly describe the way consciousness posits (or "intends") objects or to explore what other orientations toward the world may look like.[2] Rather, what the poem exposes is the experience of someone acutely aware of—yet within—the natural attitude, someone existentially perceptive to the codes of the world around her and how they imprint themselves on her thinking. Looking forward to taking the safe and speedy MRT because she can get away from the tragedy of familial intimacy—she does not need her "sullen husband to accompany [her]," she can "get away" from her sons who are "busy fighting with their wives"—her experience on the MRT becomes a reminder of her out-of-jointness in modern Singapore once away from the domestic scene: the train and the country, which she is sure will "never break down," are unlike her, who is afraid of "fall[ing] down the escalator"; the ride provides views of "flats nicer than [hers]"; the commuters make her, despite being "not busy," "tremble

1 Cyril Wong, "My Grandmother Takes the M.R.T. for the First Time," in *Contour: A Lyric Cartography of Singapore*, eds. Leonard Ng, Azhar Ibrahim, Chow Teck Seng, Kanagalatha Krishnasamy, and Tan Chee Lay, 49 (Singapore: Poetry Festival Singapore, 2019).

2 For Edmund Husserl's formulation of the "phenomenological reduction," see Edmund Husserl, *Ideas: General Introduction to Pure Phenomenology*, translated by W. R. Boyce Gibson (London: Routledge, [1931] 2013). For "orientations" and queer phenomenology, see Sara Ahmed, *Queer Phenomenology: Orientations, Objects, Others* (Durham: Duke University Press, 2006).

with the urge / to go" (her out-of-jointness represented by the enjambment on the page, rendering it rather as an inability to keep up).

I choose this poem to begin this thesis because it presents a picture of infrastructure—that which, in a broad definition, "enables" things to happen (a definition I work through in chapter 1)[3]—that centers the way one's meaning-laden relationship with infrastructure is always coded over affectively. The poem is not wholly in the service of revealing something particularly radical in the figure of the grandmother, but offers a narrative aware of the experience of living in a world that is all-too-infrastructural, a world in which the complexity of systems appears to black-box their workings, leaving one's place in this world—indeed, one's agency in it—unassured: "I remember I don't have many years / left in a country moving too fast to remember an old fool / like me. I look out the window. I smile for no reason. I can laugh or cry; nobody cares." It might be that this experience of the world is especially prevalent in Singapore, reputed for its micro-mangerial, technocratic governance.[4] The poem is not about the grandmother or about the infrastructure, but about a dimension of their relation in each other: someone can be for an infrastructure just as an infrastructure can be for someone. Centering this dimension of infrastructure, this thesis not only tracks and pursues the systems of meaning—the production of relations that an infrastructure is "for"—that infrastructural assemblages attempt to make, but also furnishes, by way of reading this production of meaning, an account of how these assemblages attempt to envelop and manage affect and psychic life. Through accounts of systems of wastewater reclamation and air-conditioning, this thesis attempts to make the point

3 Dominic Boyer, "Infrastructure, Potential Energy, Revolution," in *The Promise of Infrastructure*, eds. Nikhil Anand, Akhil Gupta, and Hannah Appel, eds. (Durham: Duke University Press, 2018), 227. See also chapter 1 in this thesis, "The Prefix "Infra-" in 'Infrastructure': Base Affects and Reclaimed Wastewater."

4 See, for example, Sal Giolando, "Technocracy, Autocracy, and Democracy in Singapore," *Democratic Erosion Consortium*, March 7, 2022, https://democratic-erosion.org/2022/03/07/technocracy-autocracy-and-democracy-in-singapore/.

that affective and psychic relations between infrastructure and subjectivity are at the heart of obstacles to finding new modes of life—new forms and relations of infrastructures—outside of, for instance, biopolitical rationality; these relations, therefore, are central to the question of what orientations, ethics, and aesthetics are possible.

This introduction will set the context and terms from which the thesis operates. Here, I also establish a coherence between the conceptual interventions across each chapter that make up the rest of the thesis. In broad terms, this thesis sets itself up in dialogue with the turn to infrastructure across disciplines in the humanities and, more particularly, the "infrastructural turn" in media and communication studies. There is a long and broad history of concerns that could possibly be filed under "infrastructure," a history that is so long and broad that it could either throw suspicion on the very concept of infrastructure, favoring a narrow reading of the term, or press instead on the very need to extend the idea of infrastructure to account for this flexibility. The following account will trace both positions, moving from the notion of "physical infrastructure" to "infrastructuralism."

**"Physical Infrastructure" and the Non-Physical Problem**

"I must have *things*," thinks a graduate student in A. S. Byatt's novel *The Biographer's Tale*, first thinking that thought in a "theoretical seminar" about deconstruction. Here, "deconstruction" is to be understood as an "abstract" method that is purely capital "T" Theoretical compared to *things* like the "dirty window" out of which he looks in the seminar room.[5] Bill Brown, in his

5 A.S. Byatt, *The Biographer's Tale* (New York: Alfred A. Knopf, 2000), unpaginated e-book, first chapter. Deconstruction, with Jacques Derrida's infamous dictum (gleefully interpreted every which way) that "there is nothing outside of the text," that often becomes a prime example of tendencies toward the abstract and immaterial. Jacques Derrida, *Of Grammatology*, translated by Gayatri Chakravorty Spivak (Delhi: Motilal Banarsidass Publishers, 1944), 158.

account of "Thing Theory," comments on Byatt's novel and points to the turn to the "external world" that such a refrain represents, "however phantasmatic the externality of that world may be theorized to be."[6] A reductive but useful plea to summarize this turn goes something like this: "Can't we learn from this materialism instead of taking the trouble to trouble it? Can't we remain content with the 'real, very dirty window'—a 'thing'—as the answer to what ails us without turning it into an ailment of its own?"[7] For Brown's part, Thing Theory is positioned as attentive to the ambiguities that construct the external world: "things lie both at hand and somewhere outside the theoretical field, beyond a certain limit, as a recognizable yet illegible remainder or as the entifiable that is unspecifiable."[8]

While Brown attempts to hold on the indistinct character of the external world of things, one conceptual strand taking up a concern with "infrastructure" points instead back to Byatt's graduate student and his plea for the physical. This theoretical move *brackets* the phantasmatic order of the external world—which does not mean to disavow it, but simply puts it "on hold" to establish another discourse or discover other orientations—and instead seeks to employ the concept of "infrastructure" as a rather precise term that can narrow, rather than expand, the great field of objects that overwhelm the writer of social theory. In this lens, there are certain things that get lost in abstraction, causing something to be sorely missing: the *physicality* of infrastructure. This emphasis is taken up primarily by media and communication scholars who see the supposed "Global Village" that deals in information and number, in metaphors of clouds and space, as a potential *trompe l'oeil* that media scholars themselves may fall into.[9] Clouds of

6 Bill Brown, "Thing Theory," *Critical Inquiry* 28, no. 1 (2001): 2.
7 Brown, "Thing Theory," 3.
8 Brown, "Thing Theory," 5. Brown does not provide a definition for the "entifiable," but it can be taken to mean something like "to be able to be made into an entity."
9 The "Global Village" concept was introduced by McLuhan in Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962), 31.

data and code are really backed by hardware: wires, materials, stuff and things that involve their own politics.[10] It is an (especially convincing and compelling, and politically important) argument against posthuman dreams of transcending the body—after all, who gets to occupy the conditions under which one can dream of such transcendence, and what is the *infrastructure* that supports such a dream (and at the same time negates it)?[11]

What this direction of reading infrastructure primarily proposes is a shift in focus: it does not necessarily propose new ways of reading these new objects or suggest that physical infrastructure is all there is to infrastructure, but is primarily interested in shifting focus to *physical infrastructure*—what Lisa Parks, after engineers, calls "stuff you can kick." In a passage worth quoting at length, Parks writes:

> In digital humanities scholarship, researchers have explored the topic of "networks" developing important historical and critical studies of networked technologies, institutions, corporations, and cultures. Fewer, however, have investigated the physical infrastructures through which audiovisual signals and data are trafficked. By physical infrastructure I am referring to the material sites and objects that are organized to produce a larger, dispersed yet integrated system for distributing material of value, whether water, electrical currents, or audiovisual signals.[12]

It is possible to see here that Parks does *not* suggest that there are "only" physical infrastructure or even that physical infrastructures take conceptual precedence over the concept of networks as she describes it. Rather, work like Parks', which seeks to investigate "the material sites and objects that are organized to produce a larger, dispersed yet integrated system for distributing material of value," live in the "for": it is work that attempts to demonstrate the "the physicality of

10 For one account of clouds and wires among many, see Tung-Hui Hu, *A Prehistory of the Cloud* (Cambridge, MA: The MIT Press, 2016).

11 See, for example, Ruha Benjamin, *Race After Technology: Abolitionist Tools for the New Jim Code* (Cambridge: Polity, 2019).

12 Lisa Parks, "Stuff You Can Kick: Toward a Theory of Media Infrastructures," in *Between Humanities and the Digital*, eds. Patrik Svensson and David Theo Goldberg (Cambridge, MA: The MIT Press, 2015), 356.

the virtual"[13] because, even when the things being distribute might themselves be "physical," like "water" (as Parks suggests), what is at stake in this tracing is the fact that that which is being distributed is "of value"—that is, physical infrastructure is what avails not only the distribution of goods, but that distribution in a symbolic system. "Water" is not water. Similarly, Brian Larkin writes elsewhere that "[i]nfrastructures are built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space."[14] Not a theory about a grand system of value, in a study of infrastructure one focuses instead on the stuff that facilitates it.

Through this focus on the *things* that are "below" the distribution of material of value, things that not only support or undergird but are one of the necessary conditions through which this distribution occurs, a study of physical infrastructures is concerned with disclosing the materials through which the "top" level processes occur. While there are particularities to the method, it remains that it is concerned with the work and practices that allow for distribution: "the term infrastructure helps to foreground processes of distribution that have taken a back seat in much humanities research on contemporary culture [...] [it] can help to stimulate new ways of conceptualizing and representing what processes of media distribution are, where they are situated, and what kinds of effects they produce"; an orientation to physical infrastructure asks what "resources, technologies, labor, and relations [...] are required to shape, energize, and sustain" the distribution of material of value?[15] In Nicole Starosielski's *The Undersea Network*, a study on undersea cables already canonical to the infrastructural turn in media and communication studies, a wide range of considerations, which would not have been apparent if

13 Paul Dourish and Genevieve Bell, "The Infrastructure of Experience and the Experience of Infrastructure: Meaning and Structure in Everyday Encounters with Space," *Environment and Planning B: Planning and Design* 34, no. 3 (2007): 424.

14 Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013): 328.

15 Parks, "Stuff You Can Kick," 356. Lisa Parks and Nicole Starosielski, introduction to *Signal Traffic: Critical Studies of Media Infrastructures* (Champaign: University of Illinois Press, 2015), 5.

one had not studied the cables but the digital content they support, jump to the fore when one shifts focus to physical infrastructure: the study of undersea cables involves reflecting on labor, cable companies, environmentalists, oceanography, security, transpacific connections, boaters, the environment and materials that comprise the cables, and much more outside of the domain of what goes on on the "digital" network.[16] One might describe a focus on physical infrastructure as an attempt to shift the field of analysis: physical infrastructures are a nexus, a ground for analyzing everything else. What might this "everything else" include? Along the physical, there might be "social practices," "institutional and epistemological interconnections,"[17] "affective infrastructures,"[18] politics, the virtual or digital, the ecological, the discursive, and so many other domains worth analyzing with or contributing toward an analysis of physical infrastructure.

This posing of physical infrastructure might be termed something like a "soft" version of an approach to thinking about the physicality of infrastructure. This soft argument for physical infrastructure aims to center the physicality of infrastructural systems while acknowledging that physical "sites" and systems, though certainly conceptually important, are not the only systems or even infrastructures fit for analysis. But something else has happened: in this multiplication of domains other than the physical, it is often assumed that one knows generally what is addressed under the category of the "physical" itself. Even Parks' definition above is self-referential: "By physical infrastructure I am referring to the material sites and objects that are organized to produce a larger, dispersed yet integrated system for distributing material of value." "Material" in the definition given clearly refers back to an understanding about what is physical.

It is probably not very useful to challenge this version of the *physical* by simply

16 See Nicole Starosielski, *The Undersea Network* (Durham: Duke University Press, 2015).
17 Starosielski, *The Undersea Network*, 25.
18 Winona LaDuke and Deborah Cowen, "Beyond Wiindigo Infrastructure," *The South Atlantic Quarterly* 119, no. 2 (2020): 247.

suggesting that, gloriously, everything is material. Doing so would elide the intervention that such approaches are attempting to make. I want to instead start with the point that definitions of the physical can be often taken for granted because the "physical" often does seem to come down to the same thing: here are some things that are typically considered "physical infrastructure": "the physical hardware and assemblage of data centres, undersea cables, internet exchange points and national and regional networks that form the backbone of the internet"; "reticulated systems of highways, pipes, wires, or cables," which AbdouMaliq Simone poses in "contrast" to "people's activities in the city"; Ashley Carse, in a keyword essay on infrastructure, notes the "undeniable materiality of its common referents like roads, pipes, rails, and cables"[19]; it might include things found in cities, like public transit, borders, walls, and security checkpoints.[20] Hence, even though studying physical infrastructure, as Parks and Larkin define it, is about tracing whatever enables the "non-physical" stuff that has been subject to universal and systematic theories of clouds, Empires, and global villages, actual references to physical infrastructure seem to be far narrower than *all* that could be said to be involved in the things that "facilitate the flow of goods, people, or ideas and allow for their exchange over space." The nagging question here is what the relationships are between the presumed categories of (a) physical infrastructure, (b) non-physical infrastructure, and (c) the non-infrastructural. When one takes it as self-evident that physical infrastructure is a known category, one equally fails to

19 James Muldoon, *Platform Socialism: How to Reclaim our Digital Future from Big Tech* (London: Pluto Press, 2022), unpaginated e-book, chapter 4, section "The Case for Digital Platforms as Publicly Owned Utilities." AbdouMaliq Simone, "People as Infrastructure: Intersecting Fragments in Johannesburg," *Public Culture* 16, no. 3 (2004): 407. Ashley Carse, "Keyword: Infrastructure: How a Humble French Engineering Term Shaped the Modern World," in *Infrastructures and Social Complexity*, edited by Penelope Harvey, Casper Jensen, Atsuro Morita (London: Routledge, 2016), 35.

20 See Donald V Kingsbury, *Only the People Can Save the People: Constituent Power, Revolution, and Counterrevolution in Venezuela* (Albany: SUNY Press, 2018) and Emile Badarin, "Settler-colonialist Management of Entrances to the Native Urban Space in Palestine," *Settler Colonial Studies* 5, no. 3 (2015): 226-235.

clearly gloss the difference between the latter two categories, or even define them. My suggestion in this thesis will be that by attempting to articulate the relationship between physical infrastructure and the non-physical, infrastructure writ large and the non-infrastructural (and how one defines these), a space opens for the subject.

If these questions are imperative, it is because in a too-easy reading of physical infrastructure, one may find themselves with a strange bedfellow in media theory: Friedrich Kittler. The Kittler one is obligated to disavow is the one who represents the "hard version" of physicality and technicity, whose arguments boil down to a technological determinism disclosed by the first line of his *Gramophone, Film, Typewriter*: "media determine our situation."[21] A more clarifying version of his determinism may point out that what Kittler sought was a description of a technical world that exhumed itself of all anthropocentric tendencies, erasing the dream of the "liberal subject" and—not unlike those who have pointed out the European bases for this imaginary, universal being[22]—points out that human bodies are themselves inscribed, "trained," by technical media (for that which fills up subjectivity must have arrived from some material thing).[23]

After all, some cybernetic resonance sounds between the assumed knowledge of the kinds of infrastructures that are physical and Kittler's definition of technical media as that which "are defined by the inability of [humans] to measure them," a definition premised on an

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21 Friedrich A. Kittler, *Gramophone, Film, Typewriter*, translated by Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, [1986] 1999), xxxix. Similarly polemically, Kittler suggests that "[o]nly what is switchable is at all." Friedrich A. Kittler, "Real Time Analysis, Time Axis Manipulation," translated by Geoffrey Winthrop-Young, *Cultural Politics* 13, no. 1 (2017): 5.

22 See, for example, Lisa Lowe, *The Intimacies of Four Continents* (Durham: Duke University Press, 2015).

23 "Culture is just that: the regimen that bodies pass through; the reduction of randomness, impulse, forgetfulness; the domestication of an animal, as Nietzsche claimed, to the point where it can make, and hold to, a promise." David E. Wellbery, foreword to *Discourse Networks 1800/1900*, by Friedrich A. Kittler, translated by Michael Metteer and Chris Cullens (Stanford: Stanford University Press, [1985] 1990), x.

inversely-proportional relationship with the importance of human action.[24] Is it not possible to say that just as Kittler's "media" that determine our situation are based on their distance from human perception and conception, the "physicality" of an infrastructure (like wires, roads, highways, walls) is similarly based on how inert it is, the extent to which it appears to minimize human agency and thought? A crucial difference arises here: if the Kittlerian style of thinking accedes to this version of an anti-humanism (which Geoffrey Winthrop-Young refers to as a "negative anthropocentrism"[25]), thereby affirming that it is in fact technical media, with a history "outside human history,"[26] that condition the very forms of thought, action, and reason available to us in a given historical "discourse network,"[27] it is a politically important fact to many who take physical infrastructure up as an object that agency—a non-concept to Kittler, who was more interested in a descriptive project of the field upon which something like the drama of agency takes shape[28]—has a role to play. Hence the soft version of physical infrastructure. But this excursion through Kittler raises the stakes, and allows me to ask further: what are the differences between physical and non-physical infrastructure, the infrastructural and the non-infrastructural, and what is the place of agency in this mapping?

**Infrastructuralism**

A focus on physical infrastructure, then, might be focused on the MRT tracks, the train, the

24 Geoffrey Winthrop-Young, introduction to "Real Time Analysis, Time Axis Manipulation," by Friedrich A. Kittler, translated by Geoffrey Winthrop-Young, *Cultural Politics* 13, no. 1 (2017): 3.

25 Winthrop-Young, "introduction," 3.

26 Winthrop-Young, "introduction," 5.

27 Kittler's term for historical periods conditioned by a regularity of technical media. Friedrich A. Kittler, *Discourse Networks 1800/1900*, translated by Michael Metteer and Chris Cullens (Stanford: Stanford University Press, [1985] 1990), x.

28 "The body is not first and foremost an agent or actor, and in order to become one it must suffer a restriction of its possibilities: the attribution of agency is a reduction of complexity. As a result, culture is no longer viewed as a drama in which actors carry out their various projects. Rather, the focus of analysis shifts to the processes that make that drama possible." Wellbery, "foreword," xv.

escalator, and other "hard things." This investigation might usefully consider the circulation of materials out of which these things were made, the slow evolution of these routes, the breakdown of trains, and the debates over whether a mass rapid transit system that relied on buses or trains would serve the city-state better.[29] What becomes clear here is the way in which studying physical infrastructure is *not* a study of "only" hard stuff; it is not to be filed under materials science. In studying physical infrastructure in the humanities, old concerns about people and social world, meaning and interpretation, labor, politics, power, and other concerns about meaning-making are still crucial—to the extent that these are pertinent to the physical infrastructure at the heart of one's discussion.

If physical infrastructure is a centering of "physical" things—with all the difficulty involved with that term discussed above—to discover the ways they afford the distribution of valuable things, "infrastructuralism" explodes the category of physical infrastructure to focus less on the type of the objects being studied ("physical" ones) to focus instead on what is apparently implied by the drive to have studied physical infrastructure in the first place—that is, to trace what constitutes the conditions of possibility for the distribution of symbolic meaning. In this move, the problematic elements of involved with using the term *physical* seem to disappear, for they affirm instead what many media and communication scholars have long affirmed: that—even if one does not follow Kittler in taking everything meaningful to only be physical—communication and media are "not only symbolic action"; there is a physical component to every act of meaning-making, social practice, and so on.[30] These kinds of claims allow one to re-

29 On these debates, see Sun Sheng Han, "Reshaping Land Transport in Singapore: A Policy Perspective," in *Reshaping Environments: An Interdisciplinary Approach to Sustainability in a Complex World*, ed. Helena Bender, 45-64 (Cambridge: Cambridge University Press, 2013).

30 Jonathan Sterne, "Transportation and Communication: Together as You've Always Wanted Them," in *Thinking with James Carey: Essays on Communications, Transportation, History*, eds. Jeremy Packer and Craig Robertson (New York: Peter Lang, 2006), 117.

align communication and transportation, to understand communication not as an angelic transference of immaterial meaning but as an act always beset by the physical nature of mediation that allow for glitches, breakdown, resistances.[31] A term I take from John Durham Peters, infrastructuralism's "fascination is for the basic, the boring, the mundane, and all the mischievous work done behind the scenes. It is a doctrine of environments and small differences, of strait gates and the needle's eye, of things not understood that stand under our worlds."[32]

Infrastructuralism, then, is a way to envelop physical and non-physical infrastructures into the broader aim of investigating "the material sites and objects that are organized to produce a larger, dispersed yet integrated system for distributing material of value," only this time recognizing the materiality of every act. To quote from Peters again, "[i]nfrastructuralism suggests a way of understanding the work of media as fundamentally logistical. [...] [L]ogistical media set the terms in which everyone must operate."[33] Opposed to the understanding of (physical) infrastructure that bracketed such things like social practices, this understanding of infrastructure poses something more categorically definite: a study of infrastructure is a study that can describe the way in which something serves as infrastructural to something else. Such a study hinges primarily on this infrastructural relation. One convincing version of this idea of infrastructure comes from AbdouMaliq Simone, whose essay provocatively titled "People as Infrastructure" takes this version of "infrastructure" to define how it is that something that could seem absolutely anti-infrastructural (people) become an infrastructure for social life in the city:

> African cities are characterized by incessantly flexible, mobile, and provisional intersections of residents that operate without clearly delineated notions of how

31 See Jonathan Sterne, "Transportation and Communication"; and John Durham Peters, *Speaking into the Air: A History of the Idea of Communication* (Chicago: The University of Chicago Press, 1999). See also Michael Serres, *Angels: A Modern Myth* (London: Flammarion, 1995).

32 John Durham Peters, *The Marvelous Clouds* (Chicago: The University of Chicago Press, 2015), 33.

33 Peters, *The Marvelous Clouds*, 37.

> the city is to be inhabited and used. These intersections, particularly in the last two decades, have depended on the ability of residents to engage complex combinations of objects, spaces, persons, and practices. These conjunctions become an infrastructure—a platform providing for and reproducing life in the city.[34]

Later in this essay, Simone specifies that it is particularly "innovative economic transactions" in inner city Johannesburg for which people serve as infrastructure.[35] Depending on who they are, a person living there has access to certain connections, are able to make certain transactions, and are equally restricted from others. Perhaps this infrastructure is "soft" or "flexible," given its "ephemeral" or "makeshift" nature; nonetheless, what is crucial in Simone's piece for the discourse about infrastructure that I am tracing out in this introduction is that only one characteristic of infrastructure remains prominent: the way it serves as a foundation for the movement of value within a particular system. In this move, concerns of how physical or hard something is might as well be rendered moot when one is concerned about the "core" of infrastructure; further, one can now speak about something like social practice or institutions as working *alongside* physical infrastructure, *as* infrastructure. In fact, much of Simone's article takes up the appropriation of "half-built environments" of physical infrastructure by people's practices, enveloping these environments into the broader infrastructure of economic activity.[36] Hence, physical things really only become an infrastructure when it becomes "activated" as such. As Susan Leigh Star puts it in her classic "The Ethnography of Infrastructure," "infrastructure is a fundamentally relational concept, becoming real infrastructure in relation to organized practices."[37] Parks and Starosielski, glossing Star and Karen Ruhleder, write that "infrastructure

34 Simone, "People as Infrastructure," 407-8.
35 Simone, "People as Infrastructure," 419
36 Simone, "People as Infrastructure," 425.
37 Susan Leigh Star, "The Ethnography of Infrastructure," *American Behavioral Scientist* 43, no. 3 (1999): 380.

encompasses both technical bases and social arrangements."[38]

Therefore, *infrastructuralism* as a lens for study is the act, as Brian Larkin would put it, of also "categorizing" something as an infrastructure: "discussing an infrastructure is a categorical act. It is a moment of tearing into those heterogeneous networks to define which aspect of which network is to be discussed and which parts will be ignored. [...] Infrastructures are not, in any positivist sense, simply "out there." The act of defining an infrastructure is a categorizing moment."[39] Already apparent from the discussion of physical infrastructure, and brought out further in this section, is the idea that many things have an "infrastructural" component and are part of an infrastuctural system. Larkin's definition of infrastructure poses everything and nothing as infrastructural: what is at stake, instead, is the position from which one speaks. As a researcher, the act of posing an infrastructural assemblage "to-be-researched" is in part an act that *constructs* that assemblage as infrastructural. Similarly, what one person sees as infrastructural might not be seen as such by another; as for a person in a wheelchair greeted by stairs, "[o]ne person's infrastructure is another's topic, or difficulty"—an example and formulation that Star provides.[40] It is therefore not only about studying the train or the escalator, but also about thinking through the institutional and political history of the MRT, the social practices around escalators on which someone could fall, and the commuters as part of the infrastructure of the MRT in Singapore—in the spirit of infrastructuralism, the commuters, in riding the train to get to and from work, play an infrastructural role: they distribute material of value (money).

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38 Parks and Starosielski, "introduction," 9. See also Susan Leigh Star and Karen Ruhleder, "Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces," *Information Systems Research* 7, no. 1 (1996): 111-134.

39 Larkin, "The Politics and Poetics of Infrastructure," 330. See chapter 1, and below, for my discussion on the usefulness of discussing infrastructure through a network metaphor.

40 Star, "The Ethnography of Infrastructure," 380.

The answer to the question of how might distinguish physical infrastructure and non-physical infrastructure is, through this way of thinking, that the two can be enveloped in a broader "infrastructuralism" in which everything, with a bit of justification, can be analyzed like those physical infrastructures on which Parks suggests scholars of digital media focus. A productive parallel here might be drawn with Kittler and those who write, so to speak, "after Kittler"[41] (including writing concerned with infrastructure). One strand is media archaeology, which, though difficult to define,[42] often operates under the parameters of constructing alternative histories of media that center materials, machines, and media objects as "writers," or agentic things that require certain forms of life: media archaeology focuses on the robot, not the engineer.[43] Following a Foucauldian method (an "archaeology"[44]) of tracing discourse, but with a Kittlerian inflection on the things that provide the parameters through which discourse is possible (even are the only sensible way that discourse itself becomes materialized as a *condition*[45]), media archaeology is about tracing forgotten technologies, materials, and minerals that themselves trace another account of history.[46] Similarly, one thinks as well about the posing of nature as infrastructure.[47]

41 See Bernard Dionysius Geoghegan, "After Kittler: On the Cultural Techniques of Recent German Media Theory," *Theory, Culture, & Society* 30, no. 6 (2013): 66-82.

42 Jussi Parikka writes: "occasionally I have been accused of not giving a simple definition of media archaeology —but would this be possible in the first place? There is no one media archaeology and would it not miss the point about multiple beginnings and multiplicity of the field to insist on one?" Jussi Parikka, "What is Media Archaeology, 10 Years Later," *Perspectivas de la Comunicación* 16, no. 1 (2023): 4.

43 My specific reference to engineers and robots is to Jussi Parikka (Interview), "Media Archaeology Out of Nature: An Interview with Jussi Parikka," interview by Paul Feigelfeld, *e-flux* 62 (2015).

44 See Michel Foucault, *The Archaeology of Knowledge and the Discourse on Language*, trans. A. M. Sheridan Smith (New York: Pantheon Books, 1971).

45 "[D]iscourse analysis ignores the fact that the factual condition is no simple methodical example but is in each case a techno-historical event." Kittler, *Gramophone, Film, Typewriter*, 229.

46 See Erkki Huhtamo and Jussi Parikka, "Introduction: An Archaeology of Media Archaeology," in *Media Archaeology Approaches, Applications, and Implications*, eds. Erkki Huhtamo and Jussi Parikka, 1-21 (Berkeley: University of California Press, 2011) and Jussi Parikka, *A Geology of Media* (Minneapolis: University of Minnesota Press, 2015).

47 See Ashley Carse. "Nature as Infrastructure: Making and Managing the Panama Canal Watershed," *Social Studies of Science* 42, no. 4 (2012): 539–563; Andrew Barry, "Infrastructure and the Earth," in *Infrastructures*

Another strand is cultural techniques, "a revision of or true inheritor of media archaeology."[48] Cultural techniques is concerned not with "given" technical systems and their make-up, but more particularly on basic techniques (often implied in or as technology) that "moves ontology into the domain of ontic operations."[49] Like (media/Foucauldian) archaeology, it eschews the interpretations of a construction of something like "man" versus "nature" to investigate instead the conditions of the *production* of that distinction; however, rather than focusing on technologies as given material or technical assemblages, one considers instead "operations"—for example, domesticating, counting, drawing—that presuppose, and around which coalesce, the "technical objects capable of performing—and to considerable extent, determining—these operations" (including technologies as we know them).[50] Thus, the technical objects that perform these operations include not only machines or hard tools, but also bodies, animals, and the natural world; the operations include that which might have been classified under the "social"—such as pedagogy and discipline—but in this light become revealed as conditioning and being conditioned by certain techniques and operations.[51] In cultural techniques, symbolic distinctions presuppose material techniques that presuppose technical

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*and Social Complexity: A Companion*, eds. Penelope Harvey, Casper Jensen, Atsuro Morita, 187-196 (London: Routledge, 2016); Sarah Nelson and Patrick Bigger, "Infrastructural Nature," *Progress in Human Geography* 46, no. 1 (2022): 86–107

48 Weihong Bao, "Archaeology of a Medium: The (Agri)Cultural Techniques of a Paddy Film Farm," *boundary 2* 49, no. 1 (2022): 25-69.

49 Bernhard Siegert, *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real*, trans. Geoffrey Winthrop-Young (New York: Fordham University Press, 2015), 9.

50 Siegert, *Cultural Techniques*, 11.

51 "Culturing techniques, then, demanded a strategic and coherent articulation of humans, techniques, and signs, which itself was adapted to the technical (and pedagogical) regimes of the epoch." Geoghegan, "After Kittler," 76. Pedagogy and discipline appear in Kittler, *Gramophone, Film, Typewriter* and *Discourse Networks 1800/1900*; See Siegert's discussion of bodies and animals in Siegert, *Cultural Techniques*; John Durham Peters discusses dolphins (among the natural world more broadly) in *The Marvelous Clouds*; see also Bao, "Archaeology of a Medium." For a discussion of the body in cultural techniques, see Sara Callahan, "The Standardized, Mechanized, and Annotated Body. Fragmentation as Cultural Technique in Recent Video Works by Kajsa Dahlberg, Kalle Brolin, and Hanni Kamaly," *Journal of Aesthetics & Culture* 16, no. 1 (2024): 1-13. See also Jussi Parikka, *Insect Media: An Archaeology of Animals and Technology* (Minneapolis: University of Minnesota Press, 2010).

objects, and just about everything can be technical.

Might a parallel not be drawn to infrastructuralism's own encompassing of many things under the rubric of "infrastructure"? While the two certainly operate from different theoretical and philosophical underpinnings, and tend to work with different concepts and scales (by sticking closer to the idea of "mediation,"[52] perhaps cultural techniques favors analyses at the scale of the basic coordinates of acculturation while infrastructuralism favors analyses that can address larger-scale, higher-level systemic and cultural constructions), the aim to uncover what operations it is that condition meaning-making and higher-level distinctions speak to a move away from the assumed knowledge of what "physical" infrastructures or "technical" systems are to "infrastructuralism" or a focus on "operations" and their "technical objects" understood broadly. This parallel leads me to the heart of what I take to be the theoretical question from which this thesis works. Further, this parallel creates a through-line between my choice of objects for analysis in the following chapters: the wastewater reclamation system (chapter 1), which might be more commonly thought of as an "infrastructure," and the air-conditioning system (chapter 2) might be more commonly approached through the idea of "environmental mediation," which is typically thought of as closer to the lineage of so-called "German Media Theory."

**Determinism, Meaning, and the Non-Infrastructural?**

I began this introduction by suggesting that the grandmother at the MRT station reflected something about the affective and psychic experience of living in an infrastructural world. To

52 See Sybille Krämer, *Medium, Messenger, Transmission: An Approach to Media Philosophy*, trans. Anthony Enns (Amsterdam: University of Amsterdam Press, 2015).

rehearse and expand my claim about the poem, the grandmother is affectively caught up in the meanings that such a world holds. She reacts to the wealth-signifying flats that look "nicer" than hers; the MRT is laden with associations with the country as a representation of that which will never break down; and the other commuters make her "tremble" with a global capitalist "urge / to go." Curiously, however, she feels also that she "can get off at any station at any time." Some questions that might frame the trajectory of the following discussion appear here: how is it that meaningless "things," built to operate in tandem, can be not just these stupid things but an *infrastructural assemblage* that has, and can create and distribute, meaning (building materials become flats that signify wealth, the smoothness of the train becomes attached to anxieties of national functioning, other people become commuters who might make our grandmother envious or excited)? And what can be made of the grandmother's agency, of her ability to "get off at any station at any time"? And to put the two questions together: how is it that one's agency might transform what infrastructural assemblages come to signify?

At first glance, the questions I ask seem to touch that which is outside of the sphere that infrastructuralism lays claim over. After all, infrastructure is precisely that which ostensibly *does not* participate in meaning-making. To ask about what gives meaning to an infrastructural system seems to entirely miss the point, for such a question seemingly asks about another discourse: the non-infrastructural, for which infrastructure sets the parameters of meaning or which may impart meaning onto infrastructure. In describing something as infrastructural, one points to its function —to enable the distribution of value (or meaning, because something valued is a meaningful judgment) in a system of value—while relinquishing the discussion of meaning-making itself to other realms (deconstruction, perhaps). But the position of infrastructure is not exactly devoid of

meaning for, in a somewhat circular way, if infrastructure is that which is categorized relationally, then infrastructure can seemingly only become an "infrastructure" retroactively and in relation, only after a system of value has been established *for* something or someone. Further, it also follows that infrastructures are not exactly totally relative or up to the whims of the categorizer: rather, a system of value addresses and implicates things and people who share in the infrastructure that enables it. I am not only posing a "chicken or the egg" situation (though my question is not *not* such a question: chapter 1 discusses genesis); I am asking instead whether there is a difference between infrastructure and the system of meaning above it, and if so, how this relationship might be described.

This question arises from an observation that infrastructure often seems at once to "materialize" or enable something like politics (as a system in which value is distributed; at the extreme of such a system, there are infrastructures that distribute valuations of who may live and who may die) while nonetheless remaining at a distance from this "immaterial," non-infrastructural side. "All along transoceanic cable routes [...] cable owners, manufacturers, and investors reorganize these spaces in order to enable the continuous flow of electrical and political power."[53] Here, the reorganization of infrastructure does not *enact* but *enables* (necessary but not sufficient): it requires *something else* to activate various forms of power. Stephen Graham argues that infrastructural disruptions "emerge, fleetingly, as materializations of the starkly contested and divided political, ecological, and social processes which tend both to characterize contemporary cities"; as materializations of something else, infrastructures by themselves *are not* self-same with those "starkly contested and divided political, ecological, and social processes," which, logically, would have an "immaterialized" or non-infrastructural prior

53 Starosielski, *The Undersea Network*, 17.

component.[54] Rafico Ruiz explains that "[r]esource frontiers, environments that highlight the ecological and extractive capitalist power dynamics that inhere in and by infrastructure, are often left out of the concerns of media theory," echoing Darin Barney's invocation of infrastructure as a non-discursive form of politics; here, while the idea that capitalist power that inheres in infrastructure does not imply that they are prior to infrastructure, it does imply that infrastructure makes (possible) extractive capitalist power dynamics, "power dynamics" being the system of value "above" infrastructure, not infrastructure itself.[55] Similarly, Laura DeNardis and Francesca Musiani suggest that the invisibility of infrastructure makes "the 'politics' inscribed in infrastructure by means of design and technical encodings [...] difficult to trace."[56] In these claims, infrastructures already suggest a form of politics fit to them, but also define a non-infrastructural realm in which these politics exist, a system of value. To be sure, a realm that is entangled deeply with infrastructure, but another realm nonetheless.

Importantly, when the discussion turns to a consideration of what infrastructures do to the non-infrastructural realm (in these examples, the realm of politics), the language of absolute *determination* is obstinately refused. A range or multiplicity of acts and infrastructures are always possible. Though "[t]he watchtower, signpost, steel gate, concrete blocks and roads junctions [...] constrain the Palestinian spatial mobility at a relatively low cost," this infrastructure only *constrains*, "provides cues and orientations"; while cable stations are insular, securitized operations, cable landings are open to struggles over use of land and water that might

54 Stephen Graham, "When Infrastructures Fail," in Disrupted Cities: When Infrastructure Fails, ed. Stephen Graham (London: Routledge, 2009), 3.

55 Rafico Ruiz, *Slow Disturbance: Infrastructural Mediation on the Settler Colonial Resource Frontier* (Durham: Duke University Press, 2021), 16; Darin Barney, "Infrastructure and the Form of Politics," *Canadian Journal of Communication* 46, no. 2 (2021): 225-246.

56 Laura DeNardis and Francesca Musiani, "Governance by Infrastructure," in *The Turn to Infrastructure in Internet Governance*, eds. Francesca Musiani, Derrick L. Cogburn, Laura DeNardis, Nanette S. Levinson (Palgrave Macmillan: 2015), 5.

contravene the state's wishes for cable infrastructure; while pipelines undermine life-sustaining Indigenous relations, they are themselves sites of struggle, and they invoke the possibility of thinking "berry patches, salmon habitats, and ursine ecologies" as critical infrastructure too.[57] Though, therefore, infrastructures do hold politics—a sticky relationship that seems to involve *some* kind of determination, both ways—this determination is not absolute: there is something else that refuses an absolute determination by infrastructure and cannot absolutely determine infrastructure, that retains a gap that allows for the very bifurcation of infrastructure and the non-infrastructural so that infrastructural politics might occur. Is there a way to describe what it means to say that an infrastructure encourages a particular form of politics, of meaning-making, one way or another? This question is exigent, for how it is that infrastructures that condense power for violent measures of exclusion continue to compel their use and repetition (which is also a question about how it is that infrastructures come to condense power, a problem of the genesis of infrastructure), and what prevents the bringing forth of other infrastructural forms?

A system of meaning, such as non-infrastructural politics, is *not* the same thing as the infrastructure that undergirds it: the infrastructure of social relations (people as infrastructure) is not the same thing as sociality (people as non-infrastructural). Is maintaining this difference imperative because suggesting that the two realms are the same would amount to that brand of determinism Kittler is taken for? Perhaps, if one accedes to this kind of determinism, the belief is that the questions I ask are unanswerable; politics and the realm of sociality is prey to the background operations, techniques, and infrastructures that are on a teleological route to a cybernetic climax. The parallel I have drawn between Kittler/media archaeology/cultural

57 Badarin, "Settler-colonialist Management of Entrances to the Native Urban Space in Palestine," 232, 234; see chapters 3 and 4 in Starosielski, *The Undersea Network*; Barney, "Infrastructure and the Form of Politics," 239; see also Anne Spice, "Fighting invasive infrastructures: Indigenous relations against pipelines," *Environment and Society: Advances in Research* 9, no. 1 (2018): 40–56.

techniques and infrastructuralism is especially productive on the question of determinism. Kittler's own dialogue with Michel Foucault and studies of infrastructure drawing on media archaeology *and* Actor-network Theory highlight the way ideas of determinism and agency —"agency" usually posed as determinism's opposite—might point to the possibility of describing what it is that prevents infrastructural determination from being absolute determination: that is, what makes the difference between infrastructure and the non-infrastructural sensible.

It must first be said that Kittler did not see his form of determinism as a teleological one, with a totalizing, unifying post-human affirmation. Though Kittler is not one to shy away from charges of determinism, it is more accurate to say that he did not think that it was a productive charge.[58] Drawing from Foucauldian *epistemes*[59]—Foucault's term for situated historical periods, with their own formal determinations of truth[60]—Kittler's discourse networks (which made the point that technical media condition any discourse at all) are "a historically specific contingency [...]. Media determine our situation, but it appears that our situation, in turn, can do its share to determine our media."[61] In Kittler's writing, it is fair to say that there is an inclusion of

58 "Technodeterminism—to be precise: the accusation of technodeterminism—is one of the most pathetic yet unfortunately also one the most handy devices in the vast arsenal of intellectual dishonesty. It is a gratuitous and more often than not misinformed mixture of ideological moralizing (to be a technodeterminist is, somehow, a politico-moral failing) and supercilious laziness (now that I have determined that X is technodeterminist, I can happily disregard X and go back to sleep). When you hear the T word, remove your gloves." Geoffrey Winthrop-Young, "Rethinking the Materiality of Technical Media: Friedrich Kittler, Enfant Terrible with a Rejuvenating Effect on Parental Discipline – A Dialogue," Dialogue between Geoffrey Winthrop-Young and Annie van den Oever, in *Technè/Technology: Researching Cinema and Media Technologies, Their Development, Use and Impact*, edited by Annie van den Oever, 219–39. Amsterdam University Press, 2014, 227.

59 "Like Foucault's, Kittler's historiography has a systematic thrust, tends toward the delineation of types." Wellberry, "foreword," xiii; see also Huhtamo and Parikka's discussion of Foucault and media archaeology in Huhtamo and Parikka, "Introduction: An Archaeology of Media Archaeology."

60 "By *episteme*, we mean, in fact, the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems." Foucault, *Archaeology of Knowledge*, 191.

61 Geoffrey Winthrop-Young and Michael Wutz, translator's introduction to *Gramophone, Film, Typewriter*, by Friedrich A. Kittler, translated by Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University

something "necessarily contingent,"[62] a contingency that is both particular (the technically, historically determined specificities of a time, discourse, and experience—a "situation") and general (the fact of a contingency that refuses a determination *toward* something, comprised of the complexity of the many operations that occur[63]). Thus, media histories, in their multiplicity, do determine; but it is in the indeterminacy of this determination (precisely because there are always *more* causal grounds) that refuses a larger singular-historical determination.

To put it another way, there is a general "multiplicity" determining causes that takes on the character of infinity. In being infinite, things are therefore also indefinite. This solution is also the one Foucault found and invoked through his thinking about discourses—which are "a set of statements that are correlated with each other, among which certain regularities (or rules of appearance, formation, transformation, etc.) obtain"; they "define a regularity" between multiple "objects, types of statement, concepts, or thematic choices"[64]—and *epistemes*, and how it is that there were breaks and thresholds between discursive formations: "The substitution of the idea of a multiplicity of discourses/practices for the episteme allows Foucault to escape from the problems of causation and change."[65] If, like discourses, or Kittler's technical media under them, infrastructures are also about understanding what it is that produces "regularities," determinate positions, and significations in a field of meaning (and how), then the idea of multiplication can

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Press, [1986] 1999), xxxv.

62 See Quentin Meillassoux, *After Finitude: An Essay on the Necessity of Contingency*, translated by Ray Brassier (London: Continuum, 2008).

63 Anna Schechtman has made a similar argument about McLuhan. "McLuhan's media theory is paradoxically deterministic and open to contingency, historical specificity and variability. One way he achieves the latter while retaining the vast explanatory potential of media determinism is by describing the content of any medium as another, previous medium. [...] This formula allows for communication technologies to have diverse effects among diverse populations and cultures." Anna Schectman, "Command of Media's Metaphors," *Critical Inquiry* 47 (2021): 660-61.

64 Foucault, *Archaeology of Knowledge*, 38; Richard A. Lynch, "Discourse," in *The Cambridge Foucault Lexicon*, eds. Leonard Lawlor and John Nale (Cambridge: Cambridge University Press), 120.

65 Mark Poster, "Foucault and History," *Social Research* 49, no. 1 (1982): 133.

also rescue, as it were, the explanation of these determinations as *absolute*. Because multiplication is dispersed, contingent, and impossible to capture, the work of something like infrastructuralism is, like Foucault's discourses, to keep multiplying and pointing out new infrastructures in the hope that it is precisely this "cultivation of multiplicity [that is] preferable to, and a mode of resistance to, the instantiation of unity, centralization, and totalization."[66] In this realm, the ethics of media archaeology and cultural techniques is in the way its writing has the potential to *multiply* histories and determinations.[67] The through line between Kittler and Foucault, therefore, is an ethical and methodological one.

The method of multiplicity receives its import from the fact that the many is "preferable to and a mode of resistance to" unity. The problem that appears here is that a neoliberal world is already one where biopolitical tactics appear to work multiply: "What we are dealing with in this new technology of power is [...] a new body, a multiple body, a body with so many heads that, while they might not be infinite in number, cannot necessarily be counted."[68] In biopolitics, there are *multiple* techniques that produce and maintain the "population" as a truth. As well, it seems that the disciplinary constitution of people as subjects is itself a process of multiplicity: the process of subjectivization is one in which "multiple bodies, forces, energies, matters, desires, thoughts, and so on [...] [are] gradually, progressively, actually and materially constituted as subjects, or as the subject."[69] In both subjectivization and biopolitics, multiple forces are forcibly

66 Erinn Gilson, "Multiplicity," in *The Cambridge Foucault Lexicon*, eds. Leonard Lawlor and John Nale (Cambridge: Cambridge University Press), 304.

67 "The history of technology is seen as being just as important as the history of thinking. Media asserts a certain power in itself, and hence has spurred accusations of media determinism. But there is more. What one can and should pick out from this is a clear need to understand the technological workings of media technologies as a force that no cultural theorist should neglect." Jussi Parikka (interview), "Circulating Concepts: Networks and Media Archaeology," interview by Braxton Soderman, Nicole Starosielski, *Amodern* 2 (2013).

68 Michel Foucault, *"Society Must Be Defended": Lectures at the Collège De France*, 1975-76, eds. François Ewald and Alessandro Fontana, trans. David Macey (New York: Picador, 2003), 245

69 Foucault, *"Society Must Be Defended,"* 28.

unified in "the subject" or "the population." But how does one know that any engagement with multiplicity is not therefore a similar operation of unifying stabilization? In other words, is the *methodological* process or ethics of cultivating a multiplicity (of engagements with the multiplicity of the world) simply a process of tracking—or, through the knowledge/power dyad, worse: reifying and materializing—ever more relations of power that only serve to determine subjects further? As Joan Copjec puts it, because in Foucault, (a) a discourse is the determination and definition of a regularity, and (b) "knowledge and power are conceived as the overall effect of the *relations among* the various conflicting positions and discourses," the "atomization and multiplication of subject positions [...] does not lead to a radical undermining of power."[70]

Foucault deals with this issue by differentiating between discourses that, though ostensibly working as a multiplicity, attempt to order and manage human multiplicities (biopolitical power) and "a nomadic and dispersed multiplicity," a multiplicity that Gilles Deleuze and Felix Guattari's discourse would hope to be able to affirm.[71] This "good" or true multiplicity, like the general contingency named earlier, is the ungovernable difference of multiplicity as such. The "bad" or false multiplicity, in contrast, might characterize those ills of neoliberal capital: flexible accumulation, real-time location tracking, and so on. These latter multiplicities do not, properly speaking (for Foucault), affirm the *reality* of multiplicity's inability to be grasped, but try instead to harness and discipline multiplicity for unifying ends.

But Foucault does not give an easy answer to how it is that one might choose to affirm the good multiplicity, or be sure that what they are doing is not a practice of bad multiplicity.

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70 I refer back to this claim in chapter 2. Joan Copjec, *Read My Desire: Lacan Against the Historicists*, (Verso, [1994] 2015), 18.

71 Michel Foucault, *Language, Counter-memory, Practice: Selected Essays and Interviews*, trans. Donald F. Bouchard and Sherry Simon, ed. Donald F. Bouchard (Ithaca: Cornell University Press, 1977), 185. See Gilles Deleuze and Felix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia* (New York: Penguin, 2009).

Foucault writes in the preface to *Anti-Oedipus* that one should "[p]refer what is positive and multiple, difference over uniformity, flows over unities, mobile arrangements over systems."[72] In the invocation of the act of preferring, something of an agency, rather than determination, is avowed. While Foucault was rightfully suspicious of the agent as something of a liberal subject who stands outside autonomy, he—especially in his later writing—still kept space for the possibility of something like a subject who could exert some form of agency. The condition for this kind of agency depends on the power relations an individual is under, the extent to which they are dominated; nonetheless, Foucault would come to argue that multiplicity as such did mean that an individual is *not* always caught and determined by power or knowledge. It is in these indeterminate moments that ethical choices can be made, which for Foucault meant fostering and practicing a personal relation to moral order that enhances the beauty and multiple pleasures of life. However, somewhat paradoxically, "these practices are nevertheless not something invented by the individual himself. They are models that he finds in his culture and are proposed, suggested, imposed upon him by his culture, his society, and his social group."[73]

Here, Foucault opens the gap of determinacy that I have attempted to bring out in infrastructuralism: in moments, in certain relations, even—especially—infrastructural ones, space opens for the possibility of an ethical fashioning in one direction or another; yet, all the subject has available for "models" are what is already in the world. In other words: in such moments, one is faced with the possibility of making something new, but what is available is only what one already has. Old questions remain: if the subject is greeted with an infrastructural world "imposed upon him," and the kind of ethic of freedom and care that Foucault recommends

72 Michel Foucault, preface to *Anti-Oedipus: Capitalism and Schizophrenia*, by Gilles Deleuze and Felix Guattari (New York: Penguin, 2009), xiii.

73 Michel Foucault, "The Ethics of the Concern of the Self as a Practice of Freedom," translated by P. Aranov and D. McGrawth, in *Ethics: Subjectivity and Truth*, ed. Paul Rabinow (New York: The New Press, 1997), 291.

first requires an indeterminacy that allows for a space of "reflection" that leads to fashioning, how can one describe what this indeterminacy *is* for the subject, when all they have are models they already know? And, how does one know that the infrastructure (or the discourse, in Foucauldian terms) with which one operates is an ethical one, one of good multiplicity?

Before moving on to how this thesis addresses these questions, I will lastly point out that studies of infrastructure, too, frequently invoke the idea of *agency* to describe the status of both infrastructure and the non-infrastructural and its ability to do things in the infrastructural world. This invocation is often in reference to new materialism and/or Actor-network Theory (ANT), which—being a descriptive theory—does not try to answer the questions above.[74] Here, agents are frequently referred to in a kind of "weaker" sense, as a thing that can materialize things differently, contrary to expectations. Hence, that infrastructure "makes things happen" is sufficient criteria for its agency.[75] For Parks and Starosielski, infrastructure is included as one of ANT's agental "actors," and ANT is indispensable to thinking infrastructure because it "insists on the complex relationalities of social and technical systems, and it troubles the tendency to reduce or ignore the agential aspects of nonhuman objects as well as the responsibilities that humans delegate to them."[76] Similarly, in her study of waste infrastructures, Brenda Chalfin writes that "feces, sewage, and associated infrastructures are bioactive forms with their own agency and energetics divorced from human intention despite their intimate association with human bodies."[77] Discovering all of these instances of agency in these varied actors is a work of

74 Actor-network Theory is "an empty grid that does not synthesise." Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford: Oxford University Press, 2005), 221. For one popular example of new materialism, see Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010).

75 Jennifer Wenzel, "Forms of Life: Thinking Fossil Infrastructure and Its Narrative Grammar," *Social Text 153* 40, no. 4 (December 2022): 161.

76 Parks and Starosielski, "introduction," 9.

77 Brenda Chalfin, *Waste Works: Vital Politics in Urban Ghana* (Durham: Duke University Press, 2023), 23

"thick description";[78] in this work, one wants to deploy more actors, which means self-reflexively including one's work: "To deploy simply means that through the report concluding the enquiry the number of actors might be increased; the range of agencies making the actors act might be expanded; the number of objects active in stabilizing groups and agencies might be multiplied; and the controversies about matters of concern might be mapped."[79] The idea that the practice of ANT, in the wake of ANT, might be an ethical practice because of its multiplication and expansion leads me back to the path I traced and questions I asked: this ethics remains one of general difference and contingency.

**Affects and Subjects (A Chapter Summary)**

If I have been using the word "subject" indiscriminately, it will be clear that it is not to pose it as that active, all-knowing conscious agent that has been critiqued so thoroughly across feminist Science and Technology Studies and elsewhere as reifying an absolute split between subjects and objects, and, by virtue of its position of truth, eliding its particular philosophical and historical grounds.[80] But, as my discussion above has shown, I think that the terms that tend to replace it in infrastructuralism and the work it sometimes draws upon—quasi-objects, agents, actors, humans, nonhumans, vibrant matter (which all tackle different things)—tend, by giving body to a subjectivity always positioned and known in advance, to make it difficult to understand what is at stake in multiplicity. I am partial instead to the way the subject is thought in psychoanalytic

78 "'Thickness' should also designate: 'Have I assembled enough?'" Latour, *Reassembling the Social*, 136.
79 Latour, *Reassembling the Social*, 138.
80 See, for example, Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 575-599; Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993); Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference* (Princeton: Princeton University Press, [2000] 2007); Gayatri Spivak, *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present* (Cambridge, MA: Harvard University Press, 1999).f

thinking, which is concerned not with subjects that know themselves, but with the ways they do not. Such subjects are not posed as absolutely split from their objects; instead, this kind of thinking centers on the absolute "extimacy"—a Lacanian term that describes the intimacy of the external world for subjectivity[81]—of things around us. In this thesis, objects appear not as known in advance, but intimately and inherently lacking (Lacan) and wrought with fantasy, love, and aggression (Klein). As such, unlike a "European liberal subject" who does not know that his universal knowledge and liberalism needs a subjugated other, this kind of discourse about the subject attempts to describe the relations between the self one does not know and the other one does not know. These relations, I will show, are infrastructural ones: they enable action in the face of non-knowledge.

The questions I raise above can be rephrased into terms that demonstrate and explicate the approach I pursue in this thesis. The first question (how can one describe what indeterminacy *is* for the subject, when all they have are models they already know?) can be approached by asking *how subjects experience indeterminacy or determinacy*. Similarly, in the next question (how does one know that the infrastructure with which one operates is an ethical one?), can be flipped to ask *what bad infrastructures might look like for the subject*. The following two chapters work to field answers to these questions.

Chapter 1 takes as a central object the wastewater reclamation system NEWater in Singapore. Read in relation to the water history of Singapore and a kinetic art sculpture, the chapter takes as its starting point the ostensible split between two forms of purification: a discursive or symbolic purification in the sphere of meaning-making, which attempts to remove

81 See, for example, Nadia Bou Ali and Surti Singh (eds.), *Extimacy* (Evanston, IL: Northwestern University Press, 2024).

an association between sewage water (or shit) and drinking water, and a "technical" purification —the removal of unwanted particulates from potable water. Between these two spheres, however, is a peculiar "aesthetics of functioning" in which some symbolic effect appears to be inherent in the very functioning of the infrastructure. This chapter suggests, against models of affect and infrastructure that I refer to as "affect-attached"—conceiving of affect as something tacked on to the proper, technical work of infrastructure—that affect can be productively conceived of as central to infrastructure. Drawing from psychoanalysis and affect theory's positioning of affect as the first relation that subjects have in the world, as well as Georges Bataille's "base materialism," the questions of indeterminacy and bad infrastructures are posed here alongside the anxiety of infrastructure's base failure. This chapter suggests that infrastructures are warranties, determinate promises against the indeterminacy of their failure; in other words, the subject might experience indeterminacy as the anxiety of possible failure. NEWater serves as a strong model here because it lays explicit the work of affect inherent in what is called the "yuck factor" in the water reclamation literature and because, as an infrastructure tied to geopolitical dreams of water sovereignty, it underscores the reproduction of affective politics through the promise of infrastructure. When infrastructures, tied as they are to political orders, disavow their failure and thereby refuse the feeling of indeterminacy from a subject, the promise of feeling good from an infrastructure's smooth functioning comes at the cost of justifying-in-advance possible violence when an infrastructure fails.

In chapter 2, the air-conditioning system in Singapore appears as a technique at the center of four related splits: the modern and the unmodern, the citizen and the non-citizen, the cool inside and the hot outside, and the divided subject. The first part of the chapter focuses on the

history of thermal comfort and air-conditioning in Singapore, and the positioning of air-conditioning as a peculiar figure of modernity; the chapter ties this dimension of the air-conditioner with its ability to differentiate and actively excludes the unmodern, figured as a migrant worker. This technique is a biopolitical one bound up with the socio-economic history of development in Singapore. I also emphasize that it is a technique that frequently implicates citizens, implying a process of subjectivization.

The second part of chapter 2 takes a closer look at the question of subject formation by introducing yet another "thing" that makes up the infrastructural assemblage of the air-conditioner: the glass window between the inside and outside of glass-walled buildings appearing everywhere in the modern nation-state. Beginning from Yuriko Furuhata's generative concept of "thermostatic desire"—the "technophilic desire to posit atmosphere itself as an object of calibration, control, and engineering"[82]—and a discussion of Foucauldian biopolitics, I suggest, in line with the discussion in this introduction, that such a framework cannot adequately answer what the psychic mechanisms by which a subject comes to accept biopolitical techniques might be: how is it that Singaporeans can believe that the island is too hot, needing air-conditioning, yet migrant workers remain in hot worker dorms and work in the heat? Here, as in chapter 1, I return to affect and failure to argue that the migrant worker, through the glass window screen, takes on associations between heat and unmodernity as a kind of "foreign body." Drawing from debates around the screen in psychoanalytic film theory, I argue that the migrant worker is a necessary figure and stain for the functioning of what I term "climatic citizenship" in Singapore. The figuration of migrant workers as that which should be excluded in the heat for the

82 Yuriko Furuhata, *Climatic Media: Transpacific Experiments in Atmospheric Control* (Durham: Duke University Press, 2022), 2.

smooth functioning of the cool nation-state is an attempt to give a face and name to the many irreducible failures explored in the chapter: unmodernity, living in the heat, and the "failure" of the subject's self-knowledge—the non-infrastructural, the perennial failure of determination.[83] By taking on these associations and their affective components, thermostatic desire becomes a truly desirous operation, turning migrant workers into figures that are only known as that which should be excluded, enabling biopolitical operations. Here, operations of determination can also be ones that *feel comfortable*: bad infrastructures can feel good.

Is it possible, then, that the grandmother's feelings and subjectivity are at the center of infrastructure? Not as a bigger agent or actor than we thought, but simply as that which "activates"[84] infrastructure as infrastructural by her feeling infrastructurally? As an infrastructure of the city-state, the MRT traffics in a feeling of assurance that can justify the continued political power of the nation—here, we might sense some knowing irony in her affirmation that "[l]ike this country, / I'm sure it'll never break down"; as part of the infrastructure of global capitalism, the nicer flats and the commuters work on her desire as an aging woman who spends most of her day in the domestic sphere: perhaps out there, as an individual wage-earner, one is removed from the disappointing poverties of husbands and children. If she can get off any station at any time, this act must not be thought of as a sovereign one of agency, and neither is it entirely determined. One might instead begin by recognizing that moments of indeterminacy are moments in which something shifts, and they feel differently about the infrastructures one is a part of. Such a position might allow one to reflect and ask how it is that their infrastructure functions, and whether she might want to get off now.

83 On failure as constitutive of subjectivity, see Bobby Benedicto, "Failure," *differences: A Journal of Feminist Cultural Studies* 54, no. 1 (2023): 95-103.

84 This wording is from Alenka Zupančič, "Biopolitics, Sexuality and the Unconscious," *Paragraph* 39, no. 1 (2016): 62.

## Chapter 1

## The Prefix “Infra-” in “Infrastructure”:

## Base Affects and Reclaimed Wastewater

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I had been worrying that
in the river’s confluence with the sea
you had been blemished
until I found you
as a spring on the banks.
—K. T. M. Iqbal, “Water”


Figure 2. NEWater Visitor Centre, Singapore, June 2024. Photo: Hui Wong.

### *Kinetic Rain* and NEWater

Above two escalators in the departure hall of Terminal 1 in Singapore's Changi Airport, copper-plated aluminum droplets dance.[85] Two rectangular arrangements of 608 raindrops on a single plane—each sixteen raindrops along its width and thirty-eight along its length—occupy an area of over seventy-five square meters; vertically, they travel over seven meters in height. Aptly named *Kinetic Rain*, each shiny droplet hangs on steel wires that are raised and lowered in patterns that repeat every fifteen minutes. These patterns are automated through a computerized motor programmed by ART+COM, the design studio behind the sculpture. Sometimes, every drop raises at once, falling and rising in unison; other times, disorder: each raindrop moves apart from the rest. Suddenly, however, a pattern re-forms: a wave, two waves, a sheet. The steel wire, kept thin and black, is difficult to spot unless one is really looking. Seen from underneath, coming up or going down the escalators, the drops descend upon you, only to pull back. Like the *fort-da* games Freud recorded, some satisfaction comes from the apparent pulling back and reappearance of objects.[86]

A cursory search would show that perpetually moving kinetic artworks that reference the natural world are not unique: waves, leaves, butterflies, and birds abound. However, *Kinetic Rain's* reference to water cycles is especially pertinent in Singapore. Arising from potable water's scarcity relative to population growth through and post- colonialism, efforts to secure water reached something of a climax with the Public Utilities Board's (PUB) NEWater

85 ART+COM, *Kinetic Rain*, 2012, lightweight aluminum, Changi Airport. https://www.nac.gov.sg/singapore-arts-scene/art-forms/visual-arts/public-art-trust/public-artworks/kinetic-rain. Changi Airport has a video available online here: "Art at Changi: Kinetic Rain," Changi Airport, *YouTube*, uploaded July 4, 2012. https://www.youtube.com/watch?v=NXuQnDeIyY8.

86 These games involved a child manipulating an object by making it come (*da*) and go (*fort*). Sigmund Freud, *Beyond the Pleasure Principle*, ed. and trans. James Strachey (London; New York: W. W. Norton & Company, 1961), 9.

technology, a water reclamation process that filters sewage and turns it into potable water. NEWater, however, was not technically unique. Other locations in the United States and Australia had produced and built successful water reclamation plants. NEWater was different because "success" has to be stretched when it came to the specificity of water reclamation: other plants like NEWater were unsuccessful not because the water was not potable, but because people did not want to drink what they perceived to be old sewage water.[87] NEWater, on the other hand, was ostensibly successful—studies demonstrate public support for the process, which they link to well-managed public campaigns.[88] "Ostensibly," because little data is available to say how much of this water is being drunk and because PUB chooses only to use NEWater for industrial purposes that require clean water, purposes including cooling the air-conditioners that are the subject of the following chapter.[89] It is only in dry spells that NEWater is drank; even then, the water is distributed into reservoirs, then treated *again* before being distributed to consumers.[90]

This chapter explores this act of cleansing across multiple registers. Reading across both NEWater and *Kinetic Rain*, I look to furnish a conception of "infrastructure," exemplified by water reclamation, as a *primarily affective* project that seeks to translate what Georges Bataille calls the "base" into the "ideal" as a condition of an infrastructure's "infrastructural" success.[91]

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87 Cecilia Tortajada, Yugal Joshi, and Asit K. Biswas, *The Singapore Water Story: Sustainable Development in an Urban City-State* (London: Routledge, 2013), 122.

88 See Leong Ching, "A Lived-Experience Investigation of Narratives: Recycled Drinking Water," *International Journal of Water Resources Development* 32, no. 4 (2016): 637-49; Yap Kheng Guan and Sally Toh, "From Zero to Hero: NEWater Wins Public Confidence in Singapore," in *Water Sensitive Cities*, ed. Carol Howe and Cynthia Mitchell (London: IWA Publishing), 139-146.

89 Yap and Toh, "From Zero to Hero," 141.

90 "NEWater," *PUB: Singapore's National Water Agency*, accessed April 22, 2024. https://www.pub.gov.sg/Public/WaterLoop/OurWaterStory/NEWater.

91 Georges Bataille, "The 'Old Mole' and the Prefix *Sur* in the Words *Surhomme* and *Surrealist*," in *Visions of Excess*, trans. Allan Stoekl (Minneapolis: University of Minnesota Press, 1985), 32-44; Georges Bataille, "Base Materialism and Gnosticism," in *Visions of Excess*, trans. Allan Stoekl (Minneapolis: University of Minnesota Press, 1985), 45-53.

This chapter also works through the notion of the "promise of infrastructure"[92] and *Kinetic Rain* to derive an infrastructural orientation that finds at its heart the very impossibility of its promise, along the lines of what Lauren Berlant calls "transitional infrastructures."[93]

I begin in this chapter by providing a short history of water politics in Singapore. Then, I read NEWater's conception, production, and reception closely to re-situate thinking affect and infrastructure: working through the notion that infrastructure is a "promise," I ask questions about infrastructural negativity and failure in relation to NEWater's promise; I also gloss some definitions of infrastructure to argue that while typical characterizations of affect in relation to infrastructure operate on what I will term an "affect-attached" model—affect "as well as/also" or "after" the technical work, NEWater demonstrates affect's *structural* function, aligning the prefix "infra-" in "infrastructure" with the "base" in Bataille. Finally, I conclude with a reflection on an "infrastructural orientation" that holds an openness to infrastructure's base failure, a certain distance or "separation" that infrastructures typically work against.[94]

**A Brief Water History of Singapore**

The political history of water in Singapore provides crucial context for NEWater's reception. A city-state located on an island off the southern tip of Malaysia, Singapore has no hinterland. Early Singapore—before the reign of British colonial power and for the better part of a century

92 Nikhil Anand, Akhil Gupta, and Hannah Appel, eds. *The Promise of Infrastructure* (Durham: Duke University Press, 2018).

93 Lauren Berlant, *On the Inconvenience of Other People* (Durham: Duke University Press, 2022), 24.

94 "Separation is the irreducible condition or spacing of the sheer fact there is a multiplicity of singularities in the world." John Paul Ricco, "The Virtue and Value of Disappearance: Muse-ecology and Invisible Flight of the Birds," in *These Birds of Temptation. intercalations: a paginated exhibition volume 6*, eds. Anna-Sophie Springer and Etienne Turpin (Haus der Kulturen der Welt, 2021), 374. Separation is "necessary for any relation." Frederic Neyrat, *The Unconstructable Earth: An Ecology of Separation* (New York: Fordham University Press, 2019), 15. While this thesis does not explicitly make an argument about infrastructure's ontology, I see it as supporting such ontological claims as those quoted.

after their arrival—had few inhabitants (though, against a popular myth, not none[95]). Water was then available through inland streams and wells from the island. However, British port trade led to rising water demand and problems with the water supply: "as early as 1890, overcrowding and pollution had contaminated most of the wells in the city, making them unsafe for drinking."[96] These difficulties prompted the digging and damming of reservoirs, beginning with MacRitchie Reservoir (named after James MacRitchie, a British engineer); arguably more significant, though, was the signed agreement in 1927 between the British and the Sultan of Johor in Malaysia (then British Malaya) for the construction of the Gunong Pulai and Pontian reservoirs in Johor, just north of Singapore, and for the export of water from these reservoirs to Singapore.

These new reservoirs were governed by another state that would become another nation-state. The gravity of this relationship came to the fore during World War II: While Japanese forces took control of reservoirs, their bombing had damaged water pipelines from Johor that effectively represented half of the water supply.[97] Post-war, such memories contributed to the fear of future water losses. Faced with this context, studies done in the 1950s and early 1960s recommended that the colony expand its inland water supplies by capitalizing on more streams, reservoirs, and avenues for rainwater collection.[98]

After its 1965 independence, the years leading up to the mid-1990s saw Singapore expanding its capacity to harvest water through conventional means, increasing damming and reservoir capacities while adding more catchments that would bring river and rainwater into those streams. However, issues persisted. Groundwater was more scarce than hoped for, and

95 See Leonard Y. Andaya, "The Orang Laut and the Negara Selat (Realm of the Straits)," in *1819 & Before: Singapore's Pasts*, ed. Kwa Chong Guan (Singapore: ISEAS–Yusof Ishak Institute, 2021), 45-54.
96 Tortajada, Joshi, and Biswas, *The Singapore Water Story*, 9.
97 Stanley Tik Loong Tan, *Battle for Singapore: Fall of the Impregnable Fortress* (Singapore: National Archives of Singapore, 2011), 244.
98 Tortajada, Joshi, and Biswas, *The Singapore Water Story*, 10-18.

although Singapore inked new deals with Malaysia that would allow them to build further catchments to capture more of the runoff from their Johor reservoirs, the two places now had to make deals not as British colonies, but as nation-states that were not always aligned.[99] Famously, Singapore's first prime minister, Lee Kuan Yew, linked the necessity of a conscription military to Malaysian water.[100] This geopolitical situation led to the increased focus on the development of desalination and water reclamation/recycling, but the high costs of the available technological solutions meant that they were deemed unfeasible.[101]

In the mid-1990s, when cheaper technologies (that were also better at filtering sewage water) became available, the PUB returned to experimenting with these water sources. After years of research and preparation, and after partnering with the private sector in order to offload some costs, the first desalination and water reclamation operations began. The desalination plant was "built by the private sector from which the PUB would purchase the water" in 2005, and the first three NEWater plants were government-owned and operated, with a fourth built in conjunction with the private sector.[102] Desalination, unfortunately, was more financially costly and energy-intensive than water reclamation, which took shape as an answer to the water troubles that were entwined with the geopolitical life of the nation. Decades of planning, work, and agonizing over water meant that NEWater's success could not be chanced.

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99 In 1957, Malaya declared independence while Singapore remained a crown colony. In 1963, after a few years of self-governance, Singapore formed Malaysia with Malaya, Sarawak, and Sabah. Political differences led to Singapore's difficult separation and strange independence in 1965.

100 "A credible defense capability helps to lower the risk of rash political acts. Whenever they were displeased with us, Malaysian leaders regularly uttered threats in the press to cut off our water supply." Lee Kuan Yew, *From Third World to First* (Singapore: Times Media Private Limited, 2000), 46.

101 Though, by the 1970s, it was technically possible and recycled water fit for drinking could be produced. Tortajada, Joshi, and Biswas, *The Singapore Water Story*, 21.

102 Tortajada, Joshi, and Biswas, *The Singapore Water Story*, 25.

**(Re-)Symbolizing NEWater**

The choice of NEWater's name represented a work (or, more exactly, an *infrastructural* work, as this chapter will argue) that had begun before any physical structure that you could "kick"[103]:

> [I]n 2002, the plan for tapping on recycled water as another water resource was set in motion: new plants were built and, equally importantly, a communication plan was put in place. A fundamental part of this outreach effort was not necessarily to focus on the technology employed, but to educate the public that this recycled water was safe for drinking. In order to try to change the overall negative popular impression towards recycled water, recycled wastewater was renamed as 'NEWater', wastewater treatment plants renamed as 'water reclamation plants', and wastewater as 'used water'.[104]

I will use the term *(re-)symbolizing* to characterize this strategy of shifting the affective response one has to the infrastructure. This choice of term comes from the contentions that (a) there is a materiality to symbolic meaning, bounded affectively; (b) symbolizing is involved in a particular way with promising; (c) this symbolizing opens to failure as a meaningful gap that infrastructure attempts to work around. A set of public-facing materials—videos, explanations, documents public campaigns, etc.—support these claims.

According to the PUB's website for the public, here is how NEWater works. First, microfiltration:

> the treated used water is passed through membranes to filter out microscopic particles and bacteria.

Next, reverse osmosis:

> a semi-permeable membrane with very small pores is used. This allows water molecules to pass through while leaving contaminants, such as viruses, bacteria, heavy metals, aromatic hydrocarbons, pesticides, etc., behind.

Finally, ultraviolet disinfection:

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103 Lisa Parks, "Stuff You Can Kick: Toward a Theory of Media Infrastructures," in *Between Humanities and the Digital*, eds. Patrik Svensson and David Theo Goldberg (Cambridge, MA: The MIT Press, 2015), 355-373.

104 Tortajada, Joshi, and Biswas, *The Singapore Water Story*, 26.

> the water is already of a high-grade quality. The third stage of the NEWater production process is Ultraviolet (UV) Disinfection which inactivates any last traces of bacteria and viruses. This process acts as an additional safety measure to guarantee the purity of NEWater.[105]

Is it possible to miss the refusal to give readers any inkling that the water had any relation to shit? "Treated used water" instead of sewage or wastewater; ambiguous "contaminants": viruses, bacteria, metals, and the "etc." that says too much; finally, not only is the water "already of a high-grade quality," the final process means that "purity is guaranteed." Certain words excluded from the technoscientific language, a play of adjectives and nouns encourages feeling comfortable and safe in NEWater. This interdiction and careful use of other words hopefully keeps the language, like the water, "clean." But this terminological game is not the only instance of re-symbolization, and cleanliness is not the only meaning being attached.

NEWater played a central role in the 2002 National Day festivities. The website also recounts: "On 9 August 2002, PUB launched NEWater to the Singaporean public when 60,000 people toasted the nation's birthday at the National Day Parade with bottles of NEWater."[106] (This sentence is almost certainly lifted from the next day's issue of *The Straits Times*, Singapore's largest newspaper.[107]) One of these spectators was the Prime Minister, Lee Kuan Yew. In a photo that captured this moment, Lee stands resolutely drinking from the bottle, a figure of the Lacanian father (the *nom-du-père*), representative for a symbolic order that guarantees assurance in itself.[108] Here, NEWater's overdetermined link to the nation is coded

105 "NEWater," *PUB: Singapore's National Water Agency*, accessed April 22, 2024. https://www.pub.gov.sg/Public/WaterLoop/OurWaterStory/NEWater.

106 "NEWater," *PUB: Singapore's National Water Agency*, accessed April 22, 2024. https://www.pub.gov.sg/Public/WaterLoop/OurWaterStory/NEWater.

107 "Most of the 60,000 spectators at the National Stadium yesterday uncapped pristine bottles of Newater and made a hearty toast on the nation's birthday." "We'll drink to that," *The Straits Times*, August 10, 2002.

108 The photo is available here: Stephanie Yeow, "Post-prime minister years," *The Straits Times Online*, September 27, 2023. https://www.straitstimes.com/multimedia/graphics/2023/09/lky-post-prime-minister-years/index.html. For Lacan, the name-of-the-father is related to Freud's notion of the primal father. Freud's *Totem and Taboo* mythologizes an inaugural patricide, an event that structured group identity around guilt and a certain

over with the political history of water; more than a matter of getting over what is called the "yuck factor,"[109] drinking water is something of a national duty, representing both an awareness of political struggle and a trust in the rationality of science and the nation-state.

Television, marketing, and news media played a role in this symbolizing, purifying work. Before plants were built, journalists were brought to the US for demonstrations that they technically worked; news articles came out of this trip, and a documentary on the journalists' experiences with the technology that would become NEWater aired on local television.[110] In newspapers and on television, experts were consulted: a panel of water scientists across fields from engineering to chemistry publicly agreed that the water met the drinking water requirements of the World Health Organization (WHO) and the United States Environmental Protection Agency (USEPA). Members of Parliament were briefed, school and community campaigns were engaged; everything down to the packaging of NEWater was considered.[111] After NEWater opened, a visitor center opened with it, becoming a popular spot for school field trips during which children would get to take a sip.[112] All of this work attempts to configure (re-symbolize) the meanings around reclaimed water through their guarantee by representatives of scientific rationality, through words that connote differently than shit or sewage, and through politicians who represent the political order (when, in the US, Barack Obama drank water in

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debt to the dead father. Lacan would suggest that what then takes his place is the "name of the father," meaning that one is bound to a signifier that resurfaces in different forms: "if this murder is the fertile moment of the debt by which the subject binds himself for life to the Law, the symbolic Father, insofar as he signifies this Law, is truly the dead Father." It is not a stretch to say that the image and name of Lee Kuan Yew, the founding father who titled one of his memoirs *The Singapore Story*, is synonymous with the nation itself. Sigmund Freud, *Totem and Taboo*, trans. James Strachey (London: Routledge Classics, 2001); Jacques Lacan, *Ecrits*, trans. Bruce Fink (New York: W. W. Norton & Company, 2006), 464. See Lee Kuan Yew, *The Singapore Story* (Singapore: Times Media Private Limited, 1998; see also Joan C. Henderson, "Remembering Lee Kuan Yew: Politics, Heritage and Political Heritage in Singapore," *International Journal of Heritage Studies* 22, no. 1 (2016): 59–69.

109 Ching, "A Lived-Experience Investigation of Narratives."

110 *Water Documentary: Thirsting For New Sources*, National Archives of Singapore, recorded August 26, 2002.

111 Yap and Toh, "From Zero to Hero," 141-5.

112 Personal experience.

Flint, Michigan, he "said he usually avoids publicity stunts. But he took a drink, saying he wanted to show the water must be safe if he's drinking it."[113]).

PUB-affiliated writers Yap Kheng Guan and Sally Toh observe that, for NEWater, "[t]he key to overcoming the psychological barrier is in shifting attention away from the source by focusing on the treatment process, which involves using advanced, state-of-the-art membrane technology."[114] As already anticipated by the allying of politicians, scientists, and journalists, an important strategy was to foreground that the technology *worked*. One final example, bearing on this idea, can draw out of it a productive problematic between matter and meaning. In a YouTube video entitled "NEWater: A Singapore Success Story," we are treated to scenes in which a clean industrial plant whirs, clear water flows through tubes, reservoirs hold an abundance of water, and bottles and taps multiply.[115] While these scenes could be characterized by their visions of cleanliness and technoscientific grandeur, I would suggest that something else is at work. Simply, a representation that demonstrates the smooth functioning of technology is just that: it is first of all an *aesthetics of functioning*. This aesthetics, as symbolic meaning, is effected by technical operation, is one with this operation; that is, a smoothly functioning technology "represents" itself as smoothly functioning. The problematic: how to characterize this relationship between "symbolic" and "material" meaning beyond simply cataloguing it as an ambiguous instance of entanglement? First, a long detour into the notion of a promise will hopefully lead back, through affect, to a way to characterize this relationship in NEWater.

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113 Kevin Freking, "Obama drinks filtered city water in Flint to show it's safe," *PBS News*, May 4, 2016, https://www.pbs.org/newshour/nation/obama-drinks-filtered-city-water-in-flint-to-show-its-safe.

114 Yap and Toh, "From Zero to Hero," 141.

115 "NEWater: A Singapore Success Story," *sgPUB*, YouTube, uploaded August 2, 2016. https://www.youtube.com/watch?v=DWWU-8_4wu0.

**NEWater's Promise**

In the introduction to the collection *The Promise of Infrastructure*, Hannah Appel, Nikhil Anand, and Akhil Gupta write that "[n]ew infrastructures are promises made in the present about our future. Insofar as they are so often incomplete—of materials not yet fully moving to deliver their potential—they appear as ruins of a promise."[116] Infrastructures all promise something and this something is variable: "The promise of infrastructure, then, is multivalent."[117] In the same collection, Brian Larkin locates the promise of infrastructure in politics: infrastructures "are reflexive points where the present state and future possibilities of government and society are held up for public assessment. The promise of infrastructure refers to this political compact, and political aesthetics makes visible the governmental promise of infrastructure as a reflexive, politically charged thing."[118] In Larkin's terms, an infrastructure has a "political aesthetics" arising from the promises of the political order under which it was constructed. For example, the 20th century and onward saw large scale technical infrastructures, linked to the political aesthetics of modernity, promising to modernize the third world nation—usually financed by world bank loans and in tandem with economic restructuring (in Singapore, funding to increase the water supply in the latter half of the 20th century through conventional methods were funded by such loans). It mattered, for example, how modern roads looked: their very aesthetics "promises free, uncluttered movement, a way to assuage the desire and fantasy of mobility."[119]

So, one starting point is to see NEWater as an *infrastructure that promises*. NEWater is

116 Hannah Appel, Nikhil Anand, and Akhil Gupta, introduction to Temporality, Politics, and the Promise of Infrastructure," in *The Promise of Infrastructure*, eds. Nikhil Anand, Akhil Gupta, and Hannah Appel (Durham: Duke University Press, 2018), 27.

117 Appel, Anand, and Gupta, "introduction," 7.

118 Brian Larkin, "Promising Forms: The Political Aesthetics of Infrastructure," in *The Promise of Infrastructure*, eds. Nikhil Anand, Akhil Gupta, and Hannah Appel, eds. (Durham: Duke University Press, 2018), 177

119 Larkin, "Promising Forms," 190.

not simply a promise of modernity. (As one might surmise from the title of Lee Kuan Yew's memoir *From Third World to First* and Singapore being one of the so-called "Asian Tigers," there was little question about Singapore's modernity.[120]) In terms of a political aesthetics, it also promised an increased water supply, which meant that it also promised less water reliance on Malaysia—the spectacle that was the 2002 national day parade would attest to this interpretation, which meets Larkin's definition of a promise. But the "aesthetic effects" explored earlier of what I called "re-symbolization" cannot be limited to this promise; for, again, what is *primarily* affirmed when Lee Kuan Yew drinks NEWater, when experts guarantee that the water meets WHO regulations, and when the aesthetics of NEWater is an aesthetics of functioning? Not just an affirmation of the power of Singapore's water politics, no—it affirms primarily that *the water is drinkable*, the condition of possibility for its political promise. Like what I called the aesthetics of functioning, the promise is something self-referential: what NEWater promises is that it works.

Problematically, then, it seems as if the infrastructural promise is circular in the case of NEWater. This formulation finds a parallel in Jacques Derrida's approach to the act of promising; for Derrida, speaking requires a promise of language: "Each time I open my mouth, each time I speak or write, I *promise* [...]. It is the 'there must be a language' (which necessarily implies: 'for it does not exist', or 'since it is lacking'), 'I promise a language.'"[121] Derrida brings forward a logic through which promises are premised on a "lack" of guarantee of existence, because if the thing promised was there, it would not need to be promised—it would be there; instead of language, there would be sameness. As John Durham Peters points out, this logic of

120 Lee Kuan Yew, *From Third World to First*.
121 Jacques Derrida, *Monolingualism of the Other; Or, the Prosthesis of Origin*, trans. Patrick Mensah (Stanford: Stanford University Press, 1998), 67.

communication is a feature; Bataille suggests that we communicate precisely because we are "discontinuous beings."[122] Hannah Arendt, in a slightly different idiom than lack, suggests that "the faculty to make and keep promises" is the "remedy for unpredictability, for the chaotic uncertainty of the future."[123]

NEWater might then say: "I promise an infrastructure." This version of the promise is a different kind of promise than that explored by Larkin and the editors of *The Promise of Infrastructure*, for whom infrastructures "hold promise" in a political manner. Larkin's promise of infrastructure holds that an infrastructure is the *aftereffect* of expectation, the materialization of a political obligation: "The very word 'promise' implies that a technological system is the aftereffect of expectation; it cannot be theorized or understood outside of the political orders that predate it and bring it into existence."[124] Rather than an infrastructure promising something about politics or fulfilling a political promise, it is possible to think that infrastructures are assemblages that promise themselves (which is what enables the political promise). Further, following Derrida, if this kind of promise arises from a prior non-existence, then it is not a guarantee: it also threatens to fail. Unlike Larkin, then, an infrastructure's promise is not something simply "met" (which is not exactly to say that it always fails—though they often do—but that it always *could* fail). Something "infrastructural" is promissory.

**Defining Infrastructure**

Out of NEWater, it is possible to name two considerations for a definition of infrastructure. First,

122 John Durham Peters, *Speaking Into the Air: A History of the Idea of Communication* (Chicago: The University of Chicago Press, 1999); Georges Bataille, *Erotism: Death and Sensuality*, trans. Mary Dalwood (San Francisco: City Lights Books, 1986), 12.
123 Hannah Arendt, *The Human Condition* (The University of Chicago Press, 1958), 237.
124 Larkin, "Promising Forms," 182.

I pointed to the structure of NEWater as one that is promissory, which means that it hinges on a possible failure. A definition of infrastructure would therefore have to provide an account of its relationship to the failure that it mitigates against. Second, though NEWater's relationship between symbolic, material, and affective has not been teased out, it is clear that any definition that takes the "hard" materiality of infrastructure to be its primary feature is untenable. Reading some "standard" definitions of infrastructure through the first necessary consideration will clarify what the relationship referred to in the second consideration between symbolic, material, and affective registers might look like.

One way to abstract from a number of definitions is that they characterize infrastructure in its relation to the relations that it supports. This characterization is found in Susan Leigh Star's classic formulation that infrastructure is relational: infrastructure is a fundamentally relational concept, becoming real infrastructure in relation to organized practices; infrastructure also "shapes and is shaped by" these practices. Star suggests that those who have an "infrastructural" relationship to infrastructure, it appears as something invisible, and it "becomes visible upon breakdown."[125] Larkin, in his seminal "The Politics and Poetics of Infrastructure," has suggested that (a) "Infrastructures are matter that enable the movement of other matter. Their peculiar ontology lies in the facts that they are things and also the relation between things," and (b) that there is an "unruly" pervasiveness to infrastructure that makes defining an infrastructural assemblage always a "categorical act."[126] One way of reading Larkin's point is that part of infrastructure's "enabling" of something involves a set of relationships categorized as infrastructural for that thing, thereby leaving out things with which the assemblage might be

125 Star has eight "properties" in total. Susan Leigh Star, "The Ethnography of Infrastructure," *American Behavioral Scientist* 43, no. 3 (1999): 380-2.

126 Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013): 329-330.

otherwise entangled but do not hold as infrastructural in that relation. For Dominic Boyer, working from Larkin, infrastructure can be abstracted to a single verb: "What do infrastructures do? They enable."[127] Jennifer Wenzel relates this enabling back to the "invisibility" of infrastructure, suggesting that functioning infrastructures enable by way of "transitivity without event," a way something happens without anything happening.[128] It is this enabling that leads AbdouMaliq Simone to characterize people as infrastructure: in a set of complex social relationships, the conjunction of "objects, spaces, persons, and practices" in inner-city Johannesburg becomes "a platform providing for and reproducing life in the city."[129] This entanglement between infrastructure and relationships matches up well with Marxist definitions of infrastructure that suggest infrastructures embed social relations.[130]

In these definitions, infrastructure, as an embedded form of relations (including exclusionary forms), paradoxically also appears as their ground. While Star does not use the language of "enabling," one might observe that infrastructure's shaped/being shaped always presupposes its existence as a "thing" that can be shaped. Thus, infrastructures hold a strange logic: relations do not "happen" atop infrastructure; rather, infrastructures *are* those relations, magnetized in such a way that one can speak of infrastructure as an assemblage *and* the relations it enables, despite the fact that infrastructures also seem to *be* those relations. One might therefore say that what is "infrastructural" is *grounded form*, the particular organizations of forms of relations. Defining infrastructure in this ambiguous sense, as a thing that grounds the

127 Dominic Boyer, "Infrastructure, Potential Energy, Revolution," in *The Promise of Infrastructure*, eds. Nikhil Anand, Akhil Gupta, and Hannah Appel, eds. (Durham: Duke University Press, 2018), 227.
128 Jennifer Wenzel, "Forms of Life: Thinking Fossil Infrastructure and Its Narrative Grammar," *Social Text 153* 40, no. 4 (December 2022): 170
129 AbdouMaliq Simone, "People as Infrastructure: Intersecting Fragments in Johannesburg," *Public Culture* 16, no. 3 (2004): 408.
130 See Darin Barney, "Infrastructure," *Krisis* 2 (2018): 79-81.

form of *other relations*, means also that it fails for those relations at the moment it stops grounding them (the infrastructural relation, defined by grounding of and failing to, is thus always an grounding *for* and a failing *for*).

In NEWater, political and technical relations are grounded in the infrastructure, but it is unclear what gives this grounding its sticking power, what it is about NEWater that makes the particular form of its relations possible (why, for example, it is that drinking reclaimed water is affirmed to be a political act that places trust in the state). Here, the promissory structure of infrastructure might be a useful starting point to what it is that "magnetizes" relations into an infrastructural assemblage: if it is only when an infrastructure *promises to function* that it can be that which that "enables at all," then what should be investigated is the function of promising itself. If it is only by NEWater promising that it functions that it grounds the relations of a new water politics in Singapore, and promises are necessary because infrastructures *cannot* be guaranteed, then something about this failure becomes central to figuring out what gives NEWater its force of organizing forms of relations that I have also been describing as its "infrastructural quality."

**Depth**

The promissory structure of infrastructure implies that there is a depth to infrastructure as a crucial part of what is "infrastructural." As Ashley Carse suggests in his keyword essay for "infrastructure," when infrastructures are defined in relational terms, as "situated, heterogeneous, and quotidian," "[i]t can lead us to neglect the infra in infrastructure: the logics of depth and

hierarchy that manifest in design, management, and maintenance."[131] Carse is right to point to the question of depth in infrastructure. The prefix "infra"—under, or below—already implies a relationship of depth and hierarchical ordering that is obscured by the flatness suggested by approaching infrastructure as a network. The network form and metaphor are especially prominent in infrastructure studies. For example, Ara Wilson suggests that "[u]nderstanding infrastructure as a network linking various nodes allows us to recognize a plurality of sites where material systems (and their failures) are entwined with social relations and with a complex interplay of structure and agency"; similarly, Steve Graham and Simon Marvin focus in a classic work on what they called "networked infrastructure," choosing the network as the proper model for infrastructural relations.[132] Here is the logic of infrastructure's networked structure: if everything is entangled, any hierarchy or depth to infrastructure takes on an illusory quality; an infrastructure is nothing but one node in a heterogeneous network (or a network of networks): the "base" of one system could be that which is enabled by another. Therefore, any depth is categorical and disappears within a network.

This mode of thinking draws heavily on flat ontological thinking that prioritizes the sameness and embeddedness of things. Here is how Larkin characterizes the problem of analyzing an infrastructural assemblage:

> the issue remains about which elements comprise that system and which are excluded. Electricity, after all, is only one of many other infrastructures that underlie the computer: the system of telematics that allow it to transmit and receive information, software protocols that delimit how the machine can be used, and the educational and cultural competence needed to understand its functioning

131 Ashley Carse, "Keyword: Infrastructure: How a Humble French Engineering Term Shaped the Modern World," in *Infrastructures and Social Complexity*, eds. Penelope Harvey, Casper Jensen, Atsuro Morita (London: Routledge, 2016). 35

132 Ara Wilson, "The Infrastructure of Intimacy," *Signs: Journal of Women in Culture and Society* 41, no. 2 (2016): 261; Steve Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001).

> and to operate it. All these substrata are necessary for the computer to operate. The simple linear relation of foundation to visible object turns out to be recursive and dispersed.[133]

This infrastructure relates to that, relates to this, to that... is there a way out? This conception gives rise to the notion that an infrastructural assemblage is an arbitrary thing that happens to appear *only* in one's "categorical act" through which one carves out an infrastructure to investigate. Against this logic, it is necessary to take as a starting point that infrastructural assemblages become (are categorized as) infrastructural because they promise to ground a set of relations, thereby *appearing coherent* as an assemblage that enables something else—always an infrastructure *for*. Before it becomes implicated in an emergent network of relations, there is a shared something for which there is an infrastructural *base*, a first set of conditions that must be met. This structure, which implies depth and hierarchy, is not arbitrary, but organized, and it persists even as a given infrastructure enters into, and mediates, networked relations. Intuitively, a highway, Star's staircase, and NEWater are not just contrived by a researcher and their instruments (though research might undoubtedly have its own parameters); they present themselves as coherent, organized around both promises of the kind Larkin suggests (political ones) and a more fundamental promise of functioning. If the promise of functioning is the grounding condition of infrastructure, i.e. it is the depth that prompts an infrastructure to emerge as an assemblage, then the substantive terms of the promise matters.[134]

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133 Larkin, "The Politics and Poetics of Infrastructure," 329-30.

134 If this question comes closer to one about ontology, I am not interested in thinking about infrastructures as "real objects" that back away from view; but in asking how symbolic (even discursive) effects, which bestow a structure of hierarchy and depth, scome about—and come about as related to the material. These are questions about the genesis of infrastructure, not of an ontology of things or being. The reference I am making to "real objects" is to the claims of object-oriented ontology. See, for an overview, Graham Harman, *Object Oriented Ontology: A New Theory of Everything* (London: Pelican Books, 2017). For one reading of language's relationship to ontology through Lacan, see Alenka Zupančič, "Object-Disoriented Ontology," in *What is Sex?* (Cambridge, MA: The MIT Press, 2017), 73-139.

**Affect, Shit, NEWater**

"Infra-" means base. Base refers, hierarchically, to that which supports and enables something. But it also means that which is "[m]orally low; despicable, ignoble; reprehensibly cowardly, craven; selfish, mean."[135] This sense is the way Georges Bataille deploys the word when he criticizes Surrealism: "to all that overthrows, perverts, and ridicules spirit, we could at the same time identify *surrealism* as a childhood disease of this base materialism."[136] For Bataille, a class revolution should affirm all that was *base*: "a crude liberation of human life from the imprisonment and masked pathology of ethics."[137] Surrealism, as he saw it, had fealty to an "Icarian revolution," "which maintained [...] the predominance of higher ethereal values."[138] Any ostensible concern with the base in Surrealism, Bataille argued, turns beautiful and sublime. Surrealist orientation was an idealism that "rests precisely in this will to poetic agitation."[139]

For NEWater, shit figures as an untraversable distance between the comfort of rationality and disgusting unknowability, a failure in the infrastructure. Shit, to take Dominique Laporte's *History of Shit* seriously, is the representative of the absolutely base, resisting every idealization.[140] Scholars who have worked on waste infrastructure point to the fact that, as political, shit's appearance in the political sphere is something of an interruption of "politics proper"; Brenda Chalfin suggests that shit is "at once irreducible, unresolvable, and impossible

135 Oxford English Dictionary (Oxford University Press), s.v. "base (adj.), sense II.10.a," February 2024. Online.
136 Bataille, "The 'Old Mole,'" 32.
137 Bataille, "The 'Old Mole,'" 32.
138 Bataille, "The 'Old Mole,'" 39.
139 Bataille, "The 'Old Mole,'" 41
140 Dominique Laporte, *History of Shit*, trans. Nadia Benabid and Rodolphe el-Khoury (Cambridge, MA: The MIT Press, 2000).

to escape, fully capture, or repress."[141] One way to read NEWater's aesthetics or promise of functioning, therefore, is as an attempt to perform the task of "idealizing," "capturing," and "repressing" shit. Indeed, is it possible to see in both NEWater's political connotations and its technocratic scientific communication a resistance to a common object? And, is it possible to see an overlap, rather than a parallel, between the two "purifications" of symbolic and material?

Between the "yuck factor" and the state, NEWater is thinkable as an infrastructure of affect management. The "yuck factor" has little or nothing to do with a rationalization of health risks, but has been characterized instead as a "profound discomfort" with drinking reclaimed water,[142] a characterization that aligns well with a classical psychoanalytic understanding of shit as the material representative of the discerning character of the anal drive, a discernment demonstrated through the right affective response to the right objects (e.g. disgust to shit).[143] In this reading, NEWater, faced with the difficult task of challenging anality itself, only manages to accede to it: every insistence that the water is pure is also an affirmation of the irreducibly base character of shit. Because the force of shit derives from its affective experience, NEWater's promise of functioning might be understood as a defence against bad feelings. Here, the entanglement of material and symbolic organizes itself around affect, which separates the infrastructure from its promise: the infrastructure, structured around the knowledge that drinking reclaimed water is affectively discomfiting, is always beset by the irreducibility of it. Bataille:

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141 *Brenda Chalfin, Waste Works: Vital Politics in Urban Ghana* (Durham: Duke University Press, 2023), 5. See also Sophia Stamatopoulou-Robbins, *Waste Siege: The Life of Infrastructure* in Palestine (Stanford, CA: Stanford University Press 2019); Antina von Schnitzler, *Democracy's Infrastructure: Techno-Politics and Protest after Apartheid* (Princeton: Princeton University Press, 2017).

142 Ching, "A Lived-Experience Investigation of Narratives," 638.

143 Julia Kristeva, *Powers of Horror: An Essay on Abjection*, trans. Leon S. Roudiez (New York: Columbia University Press, 1982); Sigmund Freud, *Three Essays on the Theory of Sexuality*, trans James Strachey (New York: Basic Books, 1975); Lou Andreas-Salomé, "'Anal' and 'Sexual,'" trans. Nina Hausmann, S. Pearl Brilmyer, Filippo Trentin, Matt Ffytche, and Melanie Adley, *Psychoanalysis and History* 24, no. 1 (2022): 19–40.

the "earth is base, the world is world, human agitation is only vulgar [...]: this is the shame of Icarian despair."[144] Hence, what organizes the political relations of NEWater is affect and failure: drinking water becomes a political act because of the affect involved with drinking that water, an affect that arises from failure; NEWater appears as an infrastructural assemblage for many things and relations because at the center, magnetizing these relations, is shitty failure.

Affect and affective relationships are often read as claims attached to infrastructure. Adriana Johnson and Daniel Nemser say that "[m]aterial infrastructures can be read as semiotic, aesthetic, and affective vehicles *in addition to* the concrete technical function they are meant to fulfil"; Larkin writes that "as objects [infrastructures] provoke such deep affectual commitments, particularly, but not only, in developing societies"; Appel, Anand, and Gupta write in the introduction to *The Promise of Infrastructure* that "[i]nfrastructures excite affects and sentiment."[145] Winona LaDuke and Deborah Cowen suggest that there are "affective infrastructures," by which they mean infrastructures whose primary function is to invoke affect.[146] This relationship between infrastructure and affect is also possible to identify in the "promise of infrastructure." If a road "promises free, uncluttered movement, a way to assuage the desire and fantasy of mobility," in this "assuaging" one can once again note something affective—the political promise is a promise that speaks to the promise of fulfiling desire. In Kleinian terms, infrastructure is like the mother's breast that gratifies: some kind of good object pre-existing us that becomes incorporated—"introjected"—as a "defence against anxiety".[147]

144 Bataille, "The 'Old Mole,'" 43.
145 Adriana Michele Campos Johnson and Daniel Nemser, "Introduction: Reading for Infrastructure," *Social Text 153* 40, no. 4 (2022): 8; Larkin, "The Politics and Poetics of Infrastructure," 332; Appel, Anand, and Gupta, "introduction," 26.
146 Winona LaDuke and Deborah Cowen, "Beyond Wiindigo Infrastructure," *The South Atlantic Quarterly* 119, no. 2 (2020): 247.
147 Melanie Klein, "Notes on Some Schizoid Mechanisms," *Journal of Psychotherapy Practice and Research* 5, no. 2 (1996): 167.

The structure underlying, in more or less explicit ways, LaDuke and Cowen's "affective infrastructure" and the notion of the promise of infrastructure, is an—at least methodological or heuristic—split between physical hardware on the one hand and meaning and affect on the other. Lisa Parks suggests that "[i]n digital humanities scholarship, researchers have explored the topic of 'networks' developing important historical and critical studies of networked technologies, institutions, corporations, and cultures. Fewer, however, have investigated the physical infrastructures through which audiovisual signals and data are trafficked."[148] Parks follows engineers in calling this material "stuff you can kick." Here, if hardware has meaning, as in the "historical and critical studies of networked technologies, institutions, corporations, and cultures," it is nonetheless first of all material: it first signifies and participates in a field of other materials *as* material, as materialist meaning; if affects and other meanings appear, they participate in another order of materiality in which other meaning is made.

The upshot of this binary between hardware "in-itself" and the meaning or affect attached to hardware is not only that meaning and affect becomes thinkable separate from, indeed working from the hard technical structure; it is also that one delineates paradoxically that affect, perhaps our *first* material experience with the world, in the body, is not involved with this other materiality. Through NEWater, I am advocating instead for the possibility of reading an infrastructural assemblage as a promissory structure formed around the negative, base possibility of a failure experienced affectively. In the case of NEWater, in my invocation of shit, this point about affect is obvious: nonetheless, while not every infrastructural failure leads to drinking sewage, there is some ground for suggesting that what is base is the fact of failure itself. Infrastructural failures, as the collapse of the material instantiation of a political and social order,

148 Parks, "Stuff You Can Kick: Toward a Theory of Media Infrastructures," 356.

are themselves *threatening*: "precarious assemblies also threaten to break down and fail."[149] As Bataille suggests, the base is anything excluded from the "masked pathology of ethics," linking the affective experience of the base to the failure of received values.[150] Larkin suggests that "when infrastructures fail or are not completed, the intensity of response and anger is driven by the affective politics that result from those ethical obligations"[151]; to invert the claim of an affect-attached model, I am suggesting that this intensity is precisely what infrastructure attempts to keep away. If, in an aesthetics of functioning, meaning and hardware are coeval and play the same role, they are linked through affect: here, base affects inherent to experiencing the failure of infrastructure itself are structural to infrastructure, the prefix 'infra-' in 'infrastructure'.[152]

**Infrastructural Orientations**

But infrastructures, by promising to function, do not necessarily render into the world that which Bataille opposed to the base—the "ideal," anti-revolutionary charge. *Kinetic Rain*, the sculpture with which this chapter began, exemplifies the aesthetics of functioning: *Kinetic Rain* is the sublime double of NEWater and the water politics of Singapore. Its droplets never leak and are

149 Appel, Anand, and Gupta, "introduction," 3.
150 Bataille, "The 'Old Mole,'" 32.
151 Larkin, "Promising Forms," 189.
152 One more question I think this definition helps to answer is that of visibility. Susan Leigh Star's original definition seems self-evidently correct. If an infrastructure enables, it recedes into the background, becoming more transparent. However, what about when infrastructures are intentionally made visible, such as Larkin's claim about a political aesthetics? Indeed, for Larkin, "many studies that begin by stating how infrastructures are invisible until they break down are fundamentally inaccurate. Infrastructures are metapragmatic objects, signs of themselves deployed in particular circulatory regimes to establish sets of effects."As Wenzel puts it, "for some, it's the invisibility of fossil infrastructure that stands in the way of transition; for others, it's the ubiquity and inescapability of fossil infrastructure that is the challenge." I suggest returning to Star: infrastructures are, indeed about invisibility. The planned visibility of infrastructure, its "signs of themselves that establish effects," might be considered itself infrastructural in that it seeks to keep the possibility of their failure, and thus the failure of what it enables (national pride, for example), invisible. Might invisibility be detached from *visuality*, and be linked to an *affective experience* of smoothness instead, the comfort of things receding into the background? In this reading, what is invisible is the experience of a broken promise: infrastructures become "visible upon breakdown," an interruption of background comfort. Wenzel, "Forms of Life," 156; Larkin, "The Politics and Poetics of Infrastructure," 336; Star, "The Ethnography of Infrastructure," 382.

forever renewable, and shit never enters the picture. *Kinetic Rain* promises a pattern or movement at the moment of its execution. It performs this pattern unflinchingly, repeating in fifteen minute intervals. When fifteen minutes are up, the droplets return to where they were, only to keep going. If *Kinetic Rain* is a model of infrastructure, it invites thinking about the infrastructural promise as a guarantee: the fact of perfect repetition is a lulling, a disavowal of failure that forecloses its possibility. Yet, for Lacan, the *fort-da* game, to which I suggested comparing *Kinetic Rain*, is less about control than about play with a sense of loss. Each throw of the cotton reel, then retrieved again, plays at a sense of absence, perhaps the first base feeling.[153] From this persepctive, *Kinetic Rain* could be about the constant encounter with another absence (*fort*). Between these two readings are questions of how infrastructures relate to failure, and how one orients oneself to infrastructure.

A useful framework could involve considering guarantees as warranties, which manage failure through conditionals.[154] To accept the conditions of a warranty is also to "forgive" on those terms: for Arendt,[155] while the promise is an answer to the unpredictability of things, forgiveness is an answer to the irreversibility of things—such as the taking place of failure; to be forgiven is to be "released from the consequences of what we have done."[156] Exigent questions about how failure is negotiated ask about the combinations of orientation toward infrastructure (questions of forgiving) and the orientation of infrastructure (conditions of warranty). If, as Larkin argues, infrastructures are embedded in a "political aesthetics," the conditions of

153 Jacques Lacan, *The Four Fundamental Concepts of Psychoanalysis. The Seminar of Jacques Lacan, Book XI*, ed. Jacques-Alain Miller and trans. Alan Sheridan (New York: W. W. Norton & Company, 1998), 62

154 I am grateful to Darin Barney, who provoked initial reflection about these terms. As Barney also argues: infrastructure is a "temporal orientation towards repetition." Barney, "Infrastructure," 79.

155 While Arendt may appear here to be a strange or disjunctive philosophical guide, Arendt's clarity in describing political stakes makes her a clear choice for a section that "turns" to politics. Arendt, as well as Berlant below, bring out how it is that an infrastructure relates to collective life.

156 Arendt, *The Human Condition*, 237.

warranties hold the future of politics. In the case of NEWater, the strengths of trusting in science and the nation are emphasized: WHO and USEPA standards and guidelines act alongside "a comprehensive and robust sampling and monitoring programme" and if something goes wrong, Singaporeans will not receive water.[157] In this warranty aspiring to be a guarantee, the recognized failure refuses, disavows, the truly base failure. The possibility of the catastrophe of drinking dirty water is foreclosed in the current political framework. As such, crucial political infrastructures that operate through failure-disavowing guarantees necessarily enter states of exception when failure occurs. At times, in the case of failure, violent justice provides "figures"[158] for what is a characteristic internal to the infrastructural relation: the force-of-law is a kind of warranty.[159]

I would like to point to two sites as incipient possibilities for re-orienting this relation.

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157 "NEWater Quality," *PUB: Singapore's National Water Agency*, accessed October 10, 2024. https://www.pub.gov.sg/Public/WaterLoop/Water-Quality/NEWater.

158 One way of managing moments of infrastructure failure is to put a "figure" to the base. Anna Tsing argues that capitalism—and its critiques—operate through narratives of "convincing protagonists": the Manchester laborer, the quasi-Christian servant leader of management. Conversely, but in line with Tsing's thinking, narratives may also deploy figures in the imaginary as a force of negative identification, of exclusion. John Paul Ricco, following Jean-Luc Nancy, suggests that to figure something and thereby exclude it means designating something to be prevented from being in common. Slavoj Žižek, in a discussion of anti-semitism, lucidly discusses this logic of figuration as something that stands in for an internal failure. Terrorist attacks on infrastructures can lead to a bolstering of national security when some characteristic of the terror in question becomes, as Stephen Graham terms it, "fetishized": turned into an abstract figure defended against; populations come to stand in as causes for failures. An example of this logic is the rampant and pervasive global Islamophobia after 9/11 in the US. On another register, soaring housing costs in Canadian metropolitan areas have been enveloped in a discourse that pins blame on immigrants. Anna Tsing, "Supply Chains and the Human Condition," *Rethinking Marxism* 21, no. 2 (April 2009): 152. John Paul Ricco, "Jean-Luc Nancy: Drawing the Edge of the Common," Parallax 26, no. 4 (2020): 429–48. Slavoj Žižek, *The Sublime Object of Ideology* (London; New York: Verso, 2008): 48-51. Stephen Graham, "When Infrastructures Fail," in Disrupted Cities: *When Infrastructure Fails*, ed. Stephen Graham (London: Routledge, 2009), 16. Nojoud Al Mallees, "Immigration is making Canada's housing more expensive. The government was warned 2 years ago," *CBC*, Jan 11, 2024. https://www.cbc.ca/news/politics/ircc-immigration-housing-canada-1.7080376.

159 For Giorgo Agamben, "the state of exception is the opening of a space in which application and norm reveal their separation and a pure force-of-law realizes (that is, applies by ceasing to apply [...]) a norm whose application has been suspended. In this way, the impossible task of welding norm and reality together, and thereby constituting the normal sphere, is carried out in the form of the exception, that is to say, by presupposing their nexus." Giorgo Agamben, *State of Exception*, trans. Kevin Attell (Chicago and London: The University of Chicago Press, 2005), 40.

The first, a comment left under the YouTube video referenced earlier:

> Ya its perhaps cleaner than any water. But thinking where it previously came from just puts me off.[160]

The second, a water-political "vow" at the very end of NEWater's visitor center to "conserve, value, and enjoy" (see figure 3). With the invocation of "enjoyment," as well as the strange possibility of holding promise and failure in contradiction by thinking about where the water comes from but drinking it anyway, it is possible to rethink violent infrastructural relations: an orientation arises through a consideration how these imperatives (to think, to drink, to conserve, to value and to enjoy) might be linked. If, after all, in the case of NEWater, acceding completely to the infrastructure (by drinking without thinking) that disavows any base possibility is an avowal of the rationality of the conditions of the technocratic nation-state that produced that infrastructure (conserving and valuing the state of politics), then what is needed is not an "Icarian revolution" that ultimately aims to reproduce "sovereign virility," politically identified with "individual authoritarian power, triumphant over all obstacles," but, in the language I have developed in this chapter, an orientation toward and of infrastructure that is open to (even enjoying) its base character, which is to say the possibility of its failure.[161] In Bataille's political economy, shit models something absolutely unproductive that always escapes capitalism's productive economy, a representative of the "accursed share."[162] Guy Hocquenghem, searching for a homosexual sociality, describes going beyond the anus in the "phallocratic" society of

160 @rexonedirection15, "Ya its perhaps cleaner than any water," comment on "NEWater: A Singapore Success Story," *sgPUB*, YouTube, uploaded August 2, 2016. https://www.youtube.com/watch?v=DWWU-8_4wu0.

161 Bataille, "The 'Old Mole,'" 34.

162 See: Georges Bataille, *The Accursed Share: An Essay on General Economy*, trans. Robert Hurley (New York: Zone Books, 1991). For a discussion of Bataille's accursed share in the context of petrocultures, see Allan Stoekl, *Bataille's Peak: Energy, Religion, and Postsustainability* (Minneapolis: University of Minnesota Press, 2007).

capitalism as the model of privatization.[163] The search is for infrastructures whose warranties give ground to the possibility of change without exceptional violence against a figure, where forgiveness without violence is possible.

This search is related to Lauren Berlant's notion of the transitional infrastructure, which is "a loose convergence that lets a collectivity stay bound to the ordinary even as some of its forms of life are fraying, wasting, and developing offshoots among types of speculative practice;"[164] transitional infrastructures assist in "living change as something other than loss, but as part of the protocols or practices that hold the world up."[165] Berlant's provocation might be read not only as staying bound *despite* "fraying" and "wasting," but being staying bound *in* fraying and wasting. Infrastructure, as the condition of possibility for relationality, helps shape "collectivities"; by invoking the word "transitional," Berlant opens thinking of infrastructural failure as change, and folding in change in a warranty without guarantee. By invoking the word "collectivity," Berlant emphasizes considering all oriented around an infrastructure a "collective," a term that throws into relief the differential relations in this collective: as worker, as user, as owner. Drinking water, thinking about where it comes from, and trying to enjoy it nonetheless: if Singapore's technocratic approach to infrastructure holds politics with a certain inertia, could such an act, as a renegotiation of failure, be part of a transitional infrastructure loosen the absolute symmetry of this relation, allowing for the possibility of transition and change as measures against the violent political dramatics justified by the failure of failure-disavowing guarantees?

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163 Guy Hocquenghem, *Homosexual Desire* (Durham: Duke University Press, 1972), 96.
164 Berlant, *On the Inconvenience of Other People*, 23.
165 Berlant, *On the Inconvenience of Other People*, 22.


Figure 3. The “Commitment Hall” of the NEWater Visitor Centre, Singapore, June 2024. Photo: Hui Wong.

## Chapter 2

## Climatic Citizenship:

## Air-Conditioning Systems and Screens of Desire

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Figure 4. Mini-split system air-conditioning units outside a police station, Singapore, June 2024.

Photo: Hui Wong.

# I

## *Snowman/Snowflake*

There is a large snowman outside an entrance to VivoCity, the largest shopping mall in Singapore.[166] Somewhat grotesque yet inoffensive, strange yet harmless, this three-story tall steel and polymer statue in a city-state that heats up twice as fast as the rest of the world[167] seems to affirm Theodor Adorno on the function of kitsch: "to deceive people about their true situation, to transfigure their existence, to allow intentions that suit some powers or other to appear to them in a fairy-tale glow."[168] Artist group inges idee's *Snowman*, alongside *Snowflake*, the companion statue of snowflakes on the roof of the mall, conjures by opposition the impossibility of coolness in Singapore; inges idee's own description of the statues is fairly ambiguous—"inges idee stages pairs of opposites, like 'hot and cold' or 'ephemeral and eternal', in a gigantic artificial architecture"—while the National Arts Council's description presents something much stronger that might as well be a cosign: "they symbolize the triumph over nature as they stand frozen in tropical Singapore."[169] It is almost banal to say that this symbolization is a fantasy, or to say that ideology requires fantasy—nevertheless, this particular thermal fantasy condenses national desires concerning citizenship, modernity, subjectivity, and colonialism.

Another image, this time requiring a bit of imagination: A Singaporean citizen, in a glass-

166 Both *Snowman* and *Snowflake* (mentioned further down) are available on the artist group's website: inges idee, "Snowman / Snowflake," *Inges Idee: Art in Public Space*, online, accessed November 12, 2024: https://ingesidee.de/art-in-public-space/snowman-snowflake-vivo-city-singapore/.

167 Jovina Ang, "Solving Singapore's urban heat island effect," *Phys Org*, February 23, 2024, online. https://phys.org/news/2024-02-singapore-urban-island-effect.html.

168 Theodor W. Adorno, "Kitsch," Essays on Music, trans. Susan H. Gillespie (Berkeley, Los Angeles and London: University of California Press, 2002), 502.

169 inges idee, "Snowman / Snowflake"; "Snowflakes," *National Arts Council Singapore*, online, accessed November 13, 2024. https://www.nac.gov.sg/singapore-arts-scene/art-forms/visual-arts/public-art-trust/public-artworks/snowflakes. Nature could equally be thought of as that which is the limit of our triumph; Frederic Neyrat suggests that nature is "that which, without being an absolute subject or a limited object, objects to the consciousness granted to it." Frederic Neyrat, *The Unconstructable Earth: An Ecology of Separation* (New York: Fordham University Press, 2019), 154.

walled building, looks outside and sees a hot street in which low-waged migrant workers work. Separated by a glass window, itself necessitated by (the functioning of) an air-conditioner, the citizen in a cooled space gazes outside at a "dematerialized" world: the air-conditioning and glass window isolate the visual from the other senses used to experience the climate.[170] Far from being fictitious or a rare sight, this chapter shows that the spatial, economic, political, thermal, and desirous situation in Singapore makes this image something of a trope: in regular parlance, a convention or cliché; in literary studies, a figure of speech, metaphor and metonymy (condensation and displacement).

Between these two images, one of a snowman that stays cool despite the tropical temperature, resisting even the ambient urban heat from the many air-conditioning units of VivoCity on the roof next to the snowflakes (see figure 5), the other of a migrant worker who works in the afternoon heat on the outside of a building in which office workers stay cool, the background of what I term "climatic citizenship" appears. This chapter attempts, rather schematically, to work toward this term through motivating the homologous connection between four structures of division—four kinds of failure: the modern nation-state and the shadow of its unmodernity, the citizen and the non-citizen, the cool inside and the warm outside (separated by the glass window), and the divided subject. In each of these divisions, the chapter will attempt to identify, too, a homology across the way they are divided, and connections between their divisions. I first argue that, as a kind of technique for subjectivization, the air-conditioner is an apparatus for the formation of a Singaporean citizenship premised on exclusions through heat. Second, I suggest, through considering the glass window a screen, that "thermostatic desire" (a

170 "While the use of a structural membrane of transparent glass in modern buildings performs a visual dematerialization, the material barriers of glass also isolate the other senses." Anne Friedberg, *The Virtual Window: From Alberti to Microsoft* (Massachusetts: MIT Press, 2006), 117.

term I take from Yuriko Furuhata) has the conceptual potential to capture the way the conditioning of citizenship has a relationship to desire and subjectivity, usefully bridging Furuhata's use of the term with psychoanalytic thinking.

In the first part of this chapter, I begin by examining a history of climate politics in Singapore, centered on modernity and air-conditioning systems. This section suggests that the narrative of post-colonial modernity in Singapore is conditioned by the air-conditioning unit—that it figures as a barrier against failed modernity. Next, through problems of mobility, biopolitics, labor, and thermal politics, I link this positioning of modernity to the relationship between migrant workers and citizens. In the second part of this chapter, I begin by suggesting that the air-conditioning of modernity is something meaningful for individuals as desiring and meaning-making subjects. Then, through an examination of the history of air-conditioned architecture in Singapore, I will suggest that glass windows, a companion to air-conditioning, organize heat, citizens, migrant workers, and the history of the nation-state: architecture is the materialization of a politics. But the medium specificity of a glass window lends itself to a visual relationship that rehearses questions about the gaze and the screen in film theory; I argue that the migrant worker is akin to a figure on screen. Here, I suggest that thinking through the terms of this debate organizes the homologies I have established around the subject's failure to cohere, a divide, which, far from being anathema to Foucauldian biopolitics, has a central place in its operations. This chapter works from the premise, explored in the introduction, that there is something fundamentally similar about what has been called "infrastructuralism" and "environmental media."[171] In each case, it is a question of unpacking material operations through which meaning is constructed. Air-conditioning therefore plays the role of an infrastructure.

171 On both, see John Durham Peters, *The Marvelous Clouds* (Chicago: The University of Chicago Press, 2015).

Figure 5. Mini-split system air-conditioning units on the roof of VivoCity, Singapore, June 2024.

Photo: Hui Wong.

**Air-conditioning and Modernity in Singapore**

In a 1999 interview, Lee Kuan Yew, Singapore's first Prime Minister, said:

> Air conditioning was a most important invention for us, perhaps one of the signal inventions of history. It changed the nature of civilization by making development possible in the tropics.[172]

Air-conditioning, for Lee, made "development possible in the tropics" because it was key to "public efficiency."[173] In this link, Lee rehearses an old trope of environmental determinism and a form of environmental racism that posits a link between the productivity of a people and the thermal conditions they inhabit. In his 1915 *Civilization and Climate*, the Yale professor Ellsworth Huntington famously proposed a "climatic hypothesis": tropical heat led to a deterioration of character and thus a kind of "inertia," with characteristics including a "lack of industry, an irascible temper, drunkenness, and sexual indulgence"; Huntington's work was based on medical research on the "enervating climate" of the tropics, in which it was claimed that white colonial men languished, mind and body, in the heat.[174] This environmental determinism naturalized European superiority through nature, another form of scientific racism that sought to capture empirical grounds for a slippery yet malleable concept of race through what can only be described as a discursive *effect* of scientific aesthetics, which is to say a bunk science that nonetheless manages to dissimulate as truth because it mimics an empirical method. Of course, as Ter Ellingson puts it, this "racism was never very scientific."[175] In the history of racisms sanctioned through institutional power, the environmental determinism put forward by

172 Lee Kuan Yew (Interview), "The East Asian Way–With Air Conditioning," interview by Nathan Gardels, *New Perspectives Quarterly* Fall 2009/Winter 2010 issue, (1999) 2009, 120.
173 Lee, "The East Asian Way," 120.
174 Ellsworth Huntington, *Civilization and Climate* (New Haven: Yale University Press, 1915), 41; Warwick Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines* (Durham, Duke University Press, 2006), 139.
175 Ter Ellingson, *The Myth of the Noble Savage* (Berkeley and Los Angeles: University of California Press, 2001), 151.

Huntington was somewhere between biological determinism and the later developmentalist framework whereby race went from a biological concept to a more modern, effusive "prism of historical and socio-economic processes" that justified the economic integration of the less-developed peoples into the modern world.[176]

But environmental determinism, at this point, is discredited. What is less easy to grapple with, however, has to do with this newer concept of race as a kind of thinking or politics and what Nicole Starosielski calls "thermal objectivity": "the sense that temperature is independent of both culture and perception."[177] From the same premises from which environmental determinism began, thermal objectivity in the context of Singapore's thermal politics is the politics of *comfort*. Jiat-Hwee Chang shows convincingly that although early research on thermal comfort included researchers who paid attention to how things felt on the field "in place," the most authoritative studies on heat were those by the air-conditioning industry financed American Society of Heating and Ventilating Engineers (ASHVE), whose measurements were done in a "comfort chamber," or an environmental laboratory where air temperature, humidity, air movement, and radiation could be adjusted and measured independently.[178] "[Y]oung white men and women," stripped to their underwear, performed repetitive tasks while their physiological responses were measured; final measurements focused only on relative humidity and temperature, with the amazing finding that thermal comfort exists in a "rather narrow" zone: "around 66 to 78 degrees Fahrenheit at a relative humidity of 70 percent—and excludes the possibility of thermal comfort if the humidity exceeds 70 percent."[179] A place where 70 percent

176 Sebastián Gil-Riaño, "Relocating anti-racist science: the 1950 UNESCO Statement on Race and economic development in the global South," *BJHS* 51, no. 2 (2018), 283.
177 Nicole Starosielski, *Media Hot and Cold* (Durham: Duke University Press, 2021), 2
178 Jiat-Hwee Chang, "Thermal comfort and climatic design in the tropics: an historical critique," *The Journal of Architecture* 21, no. 8, 1177.
179 Chang, "Thermal comfort," 1174.

humidity is often the lowest one experiences, Singapore in this measure is an always-already failed climate that needs to be cooled and dried, and air-conditioning is the infrastructure behind thermal objectivity.

For Chang, the real takeaway of these findings is less about the extent to which these experiments were right, or whether better conditions of measurement and new studies are needed. Rather, the biggest challenge posed by this history of thermal comfort is that the question of the tropical climate is precisely that: a question, like the question of race. The tropics are a problem to be solved, partly because of "deeply rooted neo-colonial socio-cultural constructions of the tropics as a zone of thermal stress and discomfort [...], when parts of the tropics became sufficiently affluent and could afford the costly and energy-intensive technology of air-conditioning, many inhabitants there immediately embraced it."[180] Hence, what Chang advocates for is not just an attempt to find new ways of cooling the tropics that could help reduce the effects of climate change, but a shift in the sociocultural perception of the humid heat that might then lead to new ways of being in the heat. One question this chapter attempts to address is what stands as obstacles to this shift.

It is with this context that the tremendous staying power of Lee's statement in popular, academic, and journalistic discourses should not be underestimated. The formulation of the "air-conditioned nation" has led to a proliferation of artistic, journalistic, literary, and other material that reflects on this phrase.[181] Racial thinking here returns, not exactly as something that is

180 Chang, "Thermal comfort," 1197.

181 For example, see Ralph Steinegger (artwork), "The Air-Conditioned Nation," https://www.ralphsteinegger.com/theairconditionednation; Lioma Ghossi, "Precarious Work, Precarious Planet: Servicing Boundaries in/for the Air-Conditioned Nation," *SG CLIMATE RALLY*, 15 March 2022, https://www.sgclimaterally.com/post/precarious-work; Heather Chen, "This country's love affair with air conditioning shows a Catch 22 of climate change," *CNN*, 9 June 2023, https://www.cnn.com/2023/06/09/asia/air-conditioning-singapore-climate-change-intl-hnk-dst/index.html;

biologically or environmentally determined, but in the very positing of the tropics and Singapore before Lee Kuan Yew as a site upon which economic and social processes of modernity were yet to occur. In this contingent history, these processes occurred in the context of a link between development and the air-conditioning unit; air-conditioners, whether they really promised the climate fit for proper environmental development or not, nonetheless became a *symbol* with material consequences: by virtue of its cooling power, it enacted a divorce from the tropics, a climate that colonial frameworks necessarily deemed uncomfortable because hot and sticky. It did not matter whether the climate *determined* the inhabitants as moderns; what mattered was simply that an air-conditioned climate was no longer closer to the "still and earthy atmosphere as of an overheated catacomb" as described in Joseph Conrad's *Heart of Darkness* than to the ostensible comfort of the British Isles.[182]

The staying power of such conceptions whereby, even if climate does not determine modernity, some association haunts and lingers is perceptible even in the most sophisticated academic writing that would stand opposed to such a link. Read, for example, as environmental and media scholar Eva Horn arrives in Singapore: "Impatiently dragging my luggage through that mass towards the taxi, I started panting, my head and my hands swollen from the heat. The driver opened the door, and I tumbled into the refrigerated inside of the car. For a moment I felt relief as my body escaped the suffocating atmosphere."[183] Even as Horn finishes this apt and rigorous essay on the cultural significance of climate control with the sentiment that "it might be worth stepping out into the very wet, very cold, very hot, very dry air that is waiting for us," she

182 Joseph Conrad, *Heart of Darkness: authoritative text, backgrounds and contexts, criticism*, ed. Paul B. Armstrong (W. W. Norton & Company, 14).

183 Eva Horn, "Air Conditioning: Taming the Climate as a Dream of Civilization," in *Climates: Architecture and the Planetary Imaginary*, eds. James Graham, Caitlin Blanchfield, Alissa Anderson, Jordan H. Carver, Jacob Moore, 233 (New York: Columbia Books on Architecture and the City, Lars Müller Publishers, 2016).

cannot help rehearsing old tropes that make her account sound like a 19th-century colonial figure who is greeted by the "mass," sweating, and immediately served by a native informant.[184] When, as it sounds, the foreigner who arrives in the heat has such an excessively horrible experience upon first contact with the air outside, how could air-conditioning be linked to anything *but* the comfort of civilization?[185]

Recounting his experience as a journalist at a park inauguration that Lee Kuan Yew attended, communication scholar Cherian George remembers Lee's attention to the trees and shade: "the pavement was so broad, [Lee] said, that the trees, even when fully ground, would leave large areas exposed to the sun. [...] He could sense the heat radiating from the pavement, he said."[186] Curiously, Lee's sensitivity to the heat arose after his studies at Cambridge University in the United Kingdom, a typical geographical connection for many post-colonial politicians.[187] Lee writes in his memoir *The Singapore Story* that upon his return, despite having "tropical clothes made," he "sweated profusely, not having acclimatised to the heat and the humidity."[188] Important enough to remark on as part of his experience returning to the tropics, one might surmise that it was not just sweat, but two kinds of climate, blending together, that provoked Lee's excessive fixation on the heat and climate control: the climate of the elite modern university and the dryer, cooler weather of Cambridge. But Lee's environmental obsession did not end there: in another memoir, the second part to *The Singapore Story* titled *From Third World to First*, he dedicates a chapter to "Greening Singapore," a chapter that recounts various political and personal campaigns to keep Singapore "clean and green." Each of these campaigns

184 Horn, "Air Conditioning," 241.
185 Strangely, my visits to Singapore from Montreal are marked instead by the comforting blanket of humidity that my dry and flaking lips have not felt since the last time.
186 George, *Singapore*, 14.
187 George, *Singapore*, 14.
188 Lee Kuan Yew, *The Singapore Story* (Singapore: Singapore Press Holdings, 1998), 134.

could warrant a chapter of this thesis: "anti-spitting campaigns," sanitary food vendors ("hawkers"), the slaughtering of cows that would dare stray onto modern roads, the planting of trees, palms and shrubs, the constant application of fertilizer to match the "luscious green grass" of New Zealand and Ireland, the transplanting of tropical plants from other regions, the cleaning of rivers, the implementation of dust particle and smoke density sensing devices, the curbing of cigarette smoke, and the famous ban on chewing gum.[189] This micromanagerial orientation to the environment that poses the environment as both natural beauty and urban cleanliness also finds the climate as that which not only can, but *must*, be controlled in Singapore to establish an international difference. As Lee writes, a "clean and green Singapore" was a "dramatic way to distinguish ourselves from other Third World countries."[190] The vision of cleanliness Lee gives here outlines the characteristics developed in Singapore's vision of modernity: if the Third World was hot and dirty, Singapore was to be cool and clean. And, while cleanliness was to be managed by bureaucrats and state agencies that were established by Lee, air-conditioning was the way that other dimension of climate and environmental control, heat, was to be managed.

By establishing air-conditioners as infrastructure that makes "development possible in the tropics," Lee parallels climate control to economic development: there are cooled and hot nations as there are developed and non-developed ones. However, another parallel arises: as air-conditioning relies on a mechanism that heats the world outside—pumping not only not air from "inside" out, but expelling the excess heat the machine generates—development is reliant on, and produces, the failed "non-developed" world. In George's influential book *Singapore: The Air Conditioned Nation* he likens the air-conditioning unit to Singapore's position in geopolitics:

189 Lee Kuan Yew, *From Third World to First* (Singapore: Singapore Press Holdings, 2000), 199–211.
190 Lee, *From Third World to First*, 199

"like any rich capitalist state, Singapore's comfort depends partly on effective insulation."[191] This (geo)political history of the air-conditioning unit in Singapore, argues George, lodges national identity with climate control. The air-conditioning unit, which performs an operation in which hot air is released while cool air (hot air conditioned) is let in, selectively "splitting" good and bad air, is a strong metaphor for Singapore's reliance on its neighbors for cheap labor.

**Migrant Workers**

It is not a secret that global capitalism has—at least since the colonial division of the world—relied on a structure in which the wealth of some part of some nations (variously, and differently, the Global North, the "core," the "developed world," the first world, and many such monikers) rely on the theft of free or comparatively cheaper human and natural resources from the "poorer nations"[192] (the Global South, the semi-periphery and periphery, the undeveloped or developing world, the third world). As Aimé Césaire puts it polemically in *Discourse on Colonialism*: "food crops destroyed, malnutrition permanently introduced, agricultural development oriented solely toward the benefit of the metropolitan countries."[193] World systems theory, in less polemical terms, suggests that "capitalism was from the beginning an affair of the world-economy and not of nation-states"; capitalism involves "an appropriation of surplus of the whole world-economy by core areas."[194]

The success of Singapore's rapid development is often captured in financialized terms; it

191 Cherian George, *Singapore: The Air-Conditioned Nation. Essays on the Politics of Climate Control 1990-2000* (Singapore: Landmark Books, 2000), 16–17.
192 See Vijay Prashad, *The Poorer Nations: A Possible History of the Global South*, (London; Brooklyn: Verso, 2012).
193 Aimé Césaire, *Discourse on Colonialism*, translated by Joan Pinkham (New York: Monthly Review Press, 1972), 43.
194 Immanuel Wallerstein, *The Capitalist World-Economy* (Cambridge: Cambridge University Press, 1979), 18-19.

has been called an "Asian Tiger," a "global city."[195] This celebrated development is not an exception to the rule of uneven development established by capitalism; its very foundation as a colonial British entrepôt, commonly told as a convincing classic narrative of the *tabula rasa*,[196] meant that Singapore was connected to British colonial era migration and movement: immigrants from India, China, and neighboring Malay states made up much of the colonial workforce. Governance was done at a distance, furthering this divide.

Toward the end of this colonial era and post-independence, and in line with developmentalist economic policy-making and thinking, heavy and rapid industrialization was a logical next step. Initially, this move was intended to be organized through Import Substitution Industrialization (ISI), a process in which previous imports are substituted by domestic production. ISI in Singapore was predicated on the possibility of a plan of a Malaysian merger that would give the city-state access to a hinterland, a plan that failed in less than two years.[197] Singapore then transitioned to Export Oriented Industrialization (EOI), an approach to industrialization that focuses instead on offering the nation's production up for foreign investment, manufacturing products for foreign markets, and exporting these goods, all to the detriment of local markets and industries. To turn Singapore marketable, comparative advantages had to be procured. Such a strategy involved targeting militant left-wing trade unions (destroying them) and wages (lowering them).[198] While this approach succeeded for a while, growing

195 Corinne Kerk, "Singapore moves up to 8th position in Schroders Global Cities Index, emerges as top city in Asia." On "global cities," see Saskia Sassen, *The Global City: New York, London, Tokyo* (Princeton University Press, 1991).

196 But not a true one: see *Studying Singapore Before 1800*, edited by Kwa Chong Guan and Peter Borschberg (Singapore: NUS Press, 2018), and Leonard Y. Andaya, "The Orang Laut and the Negara Selat (Realm of the Straits)," in *1819 & Before: Singapore's Pasts*, edited by Kwa Chong Guan, 45-54 (Singapore: ISEAS–Yusof Ishak Institute, 2021).

197 See Constance M. Turnbull, "The Road to Merdeka, 1955-1965," in *A History of Modern Singapore, 1819-2005* (Singapore: NUS Press, 2009), 407-470.

198 Christopher Tremewan, *The Political Economy of Social Control in Singapore* (New York: St. Mart, 1994), 30-44.

competition from other EOIs played a part in the state's decision in the 1980s to pursue further economic restructuring that emphasized state investment in foreign advanced capital firms, in the building up of "skills," and in pivoting toward service, finance, and technological sectors.[199] Here, the logic of EOI, which relies on the whims of global capital, remains. In these years, foreign labor in Singapore began to skyrocket—and today continues to rise—as the domestic labor force aspired toward these latter sectors and industries. While some low-wage manufacturing sector jobs had been abandoned or relegated to nearby nations,[200] there were still many positions for manual and domestic labor that foreign workers filled. At the same time, "skilled" foreign workers were invited to participate in the new finance and technological industries.

No nation-state considers all foreign workers the same.[201] In Singapore, a distinction is cast in a—to borrow Brenda Yeoh's term—"bifurcated,"[202] unambiguous way between, precisely, the two kinds of work gestured to above: more commonly, a distinction between skilled and unskilled work. Specific work permits classify and regulate migrant workers differently. There are two kinds of employment permits (with further categories within each kind) that foreign nationals working in Singapore have: "Employment Passes," for "professionals," and "Work

199 Brenda Yeoh, "Bifurcated Labour: The Unequal Incorporation of Transmigrants in Singapore," Tijdschrift voor Economische en Sociale Geografie 97, no. 1 (2006): 27.

200 Junjia Ye, *Class Inequality in the Global City: Migrants, Workers and Cosmopolitanism in Singapore* (Singapore: Palgrave Macmillan, 2016), 44.

201 In this chapter, I focus on low-waged migrant workers, who are commonly referred to as "migrant workers" *tout court*. While this usage is perhaps more colloquially accurate—as has been pointed out, "migrant," "expat," "immigrant," and other words connote definitions that do not match up to legal ones—my hope is that the brief history I cover traces the inauguration of this distinction. See Amanda Klekowski von Koppenfels, "What's the difference between a migrant and an expat?", *The Conversation*, December 20, 2016, https://theconversation.com/whats-the-difference-between-a-migrant-and-an-expat-69265 and Peter Nyers, "Abject cosmopolitanism: The politics of protection in the anti-deportation. movement," *Third World Quarterly* 24, no. 6 (2003): 1069–93.

202 Yeoh, "Bifurcated Labour."

Permits, for "skilled and semi-skilled workers."[203] These delineate two kinds of foreign labor that hold different relationships to the state's security apparatuses including, crucially, citizenship. As Yeoh writes, "[Employment Passes] may work in any sector of the economy, are not subject to levies and may bring family members with them"; on the other hand, "[w]ork Permit holders [...] are subject to a range of policy measures to ensure surveillance of migrant bodies and to ensure that they do not gain permanent foothold in the geobody of the nation."[204] For Work Permit holders, policy measures ensure that their routes to permanent residency—to say nothing of citizenship—are completely foreclosed, a situation true for many migrant workers everywhere.[205] Only holders of Employment Passes or S Passes[206] are eligible for a permanent residency application, which can lead to citizenship.

Work Permit policies position their "subaltern" holders completely outside of citizenship.[207] Migrant workers, in this position, are targets of a biopolitical rationality that places them under the purview of state and private management.[208] Work Permit holders may not marry

203 Ministry of Manpower, "Work Passes," *MOM*, accessed December 5, 2023, https://www.mom.gov.sg/passes-and-permits/.

204 Brenda S. A. Yeoh, "Cosmopolitanism and its Exclusions in Singapore," *Urban Studies* 41, no. 12 (November 2004): 2440.

205 In the context of migrant workers who perform domestic work, Rhacel Salazar Parreñas, Krittiya Kantachote, and Rachel Silvey write that "domestic workers are perpetually bound to the sponsorship of their employer as they remain ineligible for permanent residency in most destinations." Rhacel Salazar Parreñas, Krittiya Kantachote, and Rachel Silvey, "Soft violence: migrant domestic worker precarity and the management of unfree labour in Singapore," *Journal of Ethnic and Migration Studies,* 47, no. 20 (2021): 4674.

206 The S Pass is a kind of in-between Work Permit and Employment Pass, for "skilled workers" who "earn at least $3,150 a month" and requires sponsorship from a firm in Singapore. See Ministry of Manpower, "Work Passes."

207 The subaltern can, in part, be understood as "those who do not have access to the structures of citizenship." Gayatri Chakravorty Spivak (Interview), "Critical Intimacy: An Interview with Gayatri Chakravorty Spivak," interview by Steve Paulson, *LA Review of Books*, July 29, 2016, https://lareviewofbooks.org/article/critical-intimacy-interview-gayatri-chakravorty-spivak. See also Gayatri Chakravorty Spivak, "'Can the Subaltern Speak?': Revised Edition," in Can the Subaltern Speak?: *Reflections on the History of an Idea*, edited by Rosalind C. Morris, 21–78 (New York: Columbia University Press).

208 On biopolitics and management, Foucault explains: "The new art of government therefore appears as the management of freedom, not in the sense of the imperative: 'be free', with the immediate contradiction that this imperative may contain. The formula of liberalism is not 'be free'. Liberalism formulates simply the following: I am going to produce what you need to be free. I am going to see to it that you are free to be free." Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–1979*, translated by Graham Burchell (New York: Palgrave, 2008), 63.

a Permanent Resident or Singaporean citizen without first submitting an "Application for Permission" with significant paperwork, allowing the state to mediate and police a possible transgression on the border of citizenship, through verification of the "reality" of their loves, and thus in part producing a conception of what such love might be.[209] Migrant workers must also regularly undergo medical check-ups (and a check-up before applying for a permit), which range in kind depending on sector, but include checks for infectious diseases and pregnancy tests for women.[210] In terms of labor management, the state not only allows foreign labor recruitment agencies to manage migrant workers' recruiting, but they also confer legal authority onto these agencies that results in workers' heavy dependency on them or their employers. Workers are dependent, not only wages, but also for housing, food, and repatriation, a repatriation that is sometimes forced.[211] All considered, then, subaltern migrant workers are excluded from lines of access that Singaporean citizens have, including mobility in spheres of marriage, health, work, housing, and permanence in Singapore.

**Figuring the Migrant Worker**

"One of the stark ironies of contemporary migrant labor," writes Robbie B. H. Goh, "is that while market conditions exacerbate conditions of abstraction of their labor, semiotic practices

209 Or if these marriages are "marriages of convenience." Brenda S. A. Yeoh and Heng Leng Chee, "Migrant Wives, Migrant Workers, and the Negotiation of (Il)legality in Singapore," in *Migrant Encounters: Intimate Labor, the State, and Mobility Across Asia*, ed. Sara L. Friedman and Pardis Mahdavi (Pennsylvania: University of Pennsylvania Press, 2016), 196.

210 Ministry of Manpower, "Work Passes"; Brenda S. A. Yeoh and Theodora Lam, "Managing the Non-Integration of Transient Migrant Workers: Urban Strategies of Enclavisation and Enclosure in Singapore," *Urban Studies* 59, no. 16 (2022): 3297. Health also plays a central role in Foucault's consideration of biopolitics as "the attempt, starting from the eighteenth century, to rationalize the problems posed to governmental practice by phenomena characteristic of a set of living beings·forming a population: health, hygiene, birthrate, life expectancy, race." Foucault, *The Birth of Biopoliics*, 317.

211 Ye, Class Inequality in the Global City, 68–81.

and public discourses emphasize their primitive, pre-modern bodies."[212] Already nascent in the split between a Work Permit and an Employment Pass is a particular orientation the nation-state takes toward holders of the work permit wherein they are positioned as a particularly *foreign* body that threatens to destabilize the healthy nation. Health and personal check-ups concern the body of the state. In this positioning, a shift has occurred: while the previous section of this chapter started by outlining the way it is these migrant workers who keep global capital flowing (in neoliberalism, "market conditions exacerbate conditions of abstraction of their labor"), the emphasis taken by work permits seem to say precisely the opposite: that too many migrant workers would be destructive. It is in the balance of this shift that one might understand what Gayatri Spivak means when she writes, in *A Critique of Postcolonial Reason*, that "[i]f we notice that explanations and discourses are irreducibly fractured by the epistemic violence of monopoly imperialism, we begin to entertain the possibility of a determination whose ground is itself a figuration"; this displacement of meaning is a "grounding in the emergence of significance."[213] Spivak, working through Freud's notion of determination, suggests that what is at stake in the engine of capitalism is not just a "determination" that pins what one does to their identity (a race, a class, a gender).[214] Instead, there is a shift in the register of meaning that troubles the very possibility of determination as explanation. In other words, it is impossible to describe the role of work permit holders in Singapore's capitalism by the terms the nation-state gives us in policy without falling into that very discourse of foreign infection and invasion. What is at stake is to ask how their determination, as those bodies, is itself a figuration, and what meaning has been

212 Robbie B. H. Goh, "The Semiotics of Undesirable Bodies: Transnationalism, Race Culture, Abjection," *Semiotica* 200 (2014): 203.

213 Gayatri Spivak, *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present* (Cambridge, MA: Harvard University Press, 1999), 219.

214 "[T]o disclose only the race-class-gender determinations of social practices is to see overdetermination as only many determinations." Spivak, *A Critique of Postcolonial Reason*, 219.

transfigured in that figuration.

What is also crucial in Spivak's formulation is an attempt to describe how it is exactly that something like a "world system" of capitalism works: it is *not*, in Spivak's view, that certain groups are arbitrarily chosen to be objects of violence, but that the justification for capitalism operates through particular *figures* that take on meaning, which then in turn make them figures for exclusion or inclusion in particular social orders.[215] In these figures, contradictions of capitalism are smoothed over and made sense of: thus, in Singapore, Employment Pass holding "cosmopolitan expats" must establish their difference from these other migrant workers, and comport themselves properly to stand in for Singapore's "cosmopolitanism." This kind of performance mimicking a figure is an *aspirational* one in capitalism, like the quasi-Christian "servant leader" that Anna Tsing describes as smoothing over contradictions in supply-chain capitalism.[216]

Conversely, migrant workers are thus not simply excluded, but are *figured as* figures of exclusion, figures of failure.[217] The visibility of race, so pertinent to labor politics everywhere, is here only one part of the equation (though certainly not irrelevant). Goh observes that "appearances are insufficiently precise to form the basis of a strict differentiation (as in the case of intra-Asia transnationalities)."[218] Hence, it makes sense that Goh, in his thorough reading of a remarkably large number of cultural objects (films, newspapers, photos, public documents, among others), locates a "semiotics" of the "carefully differentiated" foreign body in

215 In a previous chapter, I glossed some definitions of "figures." See note 158 in chapter 1, "The Prefix 'Infra-' in 'Infrastructure'."

216 See the chapter "Constructing Cosmopolitanism in Singapore: Financial Professionals" in Ye, *Class Inequality in the Global City*; and Anna Tsing, "Supply Chains and the Human Condition," Rethinking Marxism 21, no. 2 (April 2009): 152.

217 John Paul Ricco suggests that what is needed is figuration without exclusion. John Paul Ricco, "Jean-Luc Nancy: Drawing the Edge of the Common," *Parallax* 26, no. 4 (2020): 429–48.

218 Goh, "The Semiotics of Undesirable Bodies: Transnationalism, Race Culture, Abjection," 219.

transcultural migration. Goh's contention is that in order to demarcate the difference between "national" and "foreign" not given by bodily markers (i.e. as something like race supposedly would), the realm of "culture" steps in. Cultural production about migrant workers, Goh suggests, are coded in four ways: as illicitly sexual bodies, as mobs that interrupt smooth social functioning, as bodies that spread diseases (this medical semiotics finds policy correlates in sexual and medical tests and the concern with hygiene in workers' dorms), and as violent.[219] Morally failed, migrant workers on Work Permits are differentiated not only from citizens, but "cosmopolitan expats" who are "exempt from discourses of the laboring body."[220] Goh's study productively shows that the incoherence of the nation-state, its internal contradictions, necessitates the production of symbols of prejudice.

Florence Yean Yng Ling and Stephanie Wun Kai Ho, in a study involving young Singaporeans, have demonstrated that the construction sector, filled with a "largely unskilled foreign workforce," is perceived by these Singaporeans as "dangerous."[221] Isabel Phua, a migrant worker activist, recounts her experience with migrant workers:

> I was *fearful* [emphasis added] of migrant workers, now I speak out for them [...] prejudices among Singaporeans towards migrant workers—many of whom hail from developing countries like China, India and Bangladesh—still run deep. I was exposed to this prejudice from a young age, when my elders would warn me that if I was naughty, they'd get foreign workers to come and catch me."[222]

That this anecdote is throwaway and short in the context of the article indicates that it rests on cultural trope that is understood and circulating—namely, that migrant workers and the work

219 Goh, "The Semiotics of Undesirable Bodies," 213.
220 Goh, "The Semiotics of Undesirable Bodies," 213.
221 Florence Yean Yng Ling and Stephanie Wun Kai Ho, "Understanding and Impressions of Jobs in the Construction Industry by Young Adults in Singapore," *Journal of Professional Issues in Engineering Education & Practice* 139, no. 2 (2013): 110.
222 Isabel Phua, "Gen Y Speaks: I was fearful of migrant workers, now I speak out for them," *Today*, March 24, 2019, https://www.todayonline.com/commentary/gen-y-speaks-i-was-fearful-migrant-workers-now-i-speak-out-them.

they do are horrifying.[223] In the same way that, through Spivak, imperialism and global capitalism work through displacements of meaning that provide figures against contradictions, is it possible to say that there is some particularity in Singapore in which the migrant worker as a figure is that which determines the possibility of a kind of (perhaps affective or symbolic, and certainly legal) citizenship? And is there a way to describe *heat* as playing some part in this split?

Before answering these questions, it is worth re-iterating the point Ling and Ho make: today, further into Singapore's many economic restructurings, much of the work done outside is performed by migrant workers. In 2022, there were an estimated 415,000 foreign workers working in construction and construction adjacent sectors.[224] Most of these workers are nationals of neighboring Southeast Asian nations, including Bangladesh, India, Myanmar, and the Philippines. Migrant workers make up a majority of workers in construction, with Singaporean citizens comprising under 100,000.[225] As a "global city," capitalist development manifests itself in space as road work, new buildings being built, and infrastructural repair and construction.[226] Rapid urban and architectural development, tied to developmental aims that have characterized the history of Singapore's rapid growth, are now (post 1980s) fueled by industries that are

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223 See, for example: "If you don't study hard you will become a road sweeper." "3 Things Singaporean Parents Should Stop Telling Their Kids Now," *theAsianparent*, accessed December 5, 2023, https://sg.theasianparent.com/things-singaporean-parents-should-stop-telling-their-kids-now; Aya Imura, "'If you don't study hard you will be cutting grass like this man here!'" *Five Stars and a Moon*, accessed December 5, 2023, https://www.fivestarsandamoon.com/2014/09/if-you-dont-study-hard-you-will-be-cutting-grass-like-this-man-here/.

224 Statista Research Department, "Number of foreign workers employed in construction and marine shipyard and process in Singapore from 2015 to 2022," *statista*, 2023, https://www.statista.com/statistics/1054354/singapore-foreign-construction-workers-employed/#:~:text=As%20at%20December%202022%2C%20415,Bangladesh%2C%20India%2C%20and%20Myanmar.

225 Given, too, the cultural perceptions of the work typically done by migrant labor discussed in this chapter, it is possible that Singaporeans occupy mostly managerial positions. However, this data is not readily available. Statista Research Department, "Number of residents employed in the construction industry in Singapore from 2013 to 2022," *statista*, 2023, https://www.statista.com/statistics/1054325/number-of-residents-employed-construction-industry-singapore/.

226 On the idea of capitalist development being spatialized in urban processes, see Henri Lefebvre, *The Production of Space*, translated by Donald Nicholson-Smith (Oxford; Cambridge: Blackwell 1991).

comprised mostly of migrant workers. Jobs in construction, marine shipyard, and processing sectors make up around 40% of Singapore's foreign workforce, including non Work Permit holders. Migrant domestic workers make up 25%, and are the next largest group holding Work Permits.[227] Of course, many of Singapore's iconic structures—including the Gardens by the Bay, an air-conditioned sign of modernity *par excellence*[228]—involve this migrant labor in maintenance and construction. This work, in short, is the underside of two figures.

227 "From Supply Chain to Social Change: Overview of Singapore's Migrant Workforce," *janio*, accessed 13 December 2024, https://www.janio.asia/resources/articles/from-supply-chain-to-social-change-overview-of-singapores-migrant-workforce.

228 Nadine Chan, "Ambient Governmentality and Media Architectures of Humidity Control," paper presented at *Strata of the Asia-Pacific: Mediating the Geologic and Aquatic Environment*, online, October 25, 2024). See also Eng-Beng Lim, "Future Island," Third Text 28, no. 4-5 (2014): 445–53.


Figure 6. Toa Payoh bus interchange, Singapore, June 2024. Photo: Hui Wong.

## II

### The Morality of the Air-Conditioner

Newspaper columnist Lee Huay Leng, condemning Singaporeans for their comfort in air-conditioned buildings, writes in 2002:

> One of the latest infrastructure developments is the air-conditioned Toa Payoh bus interchange [...]. The Toa Payoh bus interchange is in fact a metaphorical building. Its big glass panels allow commuters to see the view outside, knowing that it is scorching hot out there. Yet Singaporeans comfortably place themselves in another self-created, spacious world. With Singaporeans growing up and being accustomed to such an environment, what kind of national character will Singapore shape?[229]

Lee's invocation of national and moral character in relation to the Toa Payoh bus interchange (see figure 6) hints at the possibility that the air-conditioner, and the cool air concomitant with it, extends questions of cool "modernity" inward from the nation-state to individual Singaporeans; the air-conditioner here signifies the caricature of moderns as passive and unproductive. This morality is the kind invoked by, for example, the humans aboard the giant spaceship in Andrew Stanton's *WALL-E*, in which humans become receptacles for the small pleasures of life offered by consumer goods.

What are the discursive grounds that conditioned the possibility for such a perspective on the air-conditioner? One place to look is the state's economic restructuring: as fewer and fewer Singaporeans took up jobs involving manual labor (and more migrants did), Deputy Prime Minister (and Lee Kuan Yew's son) Lee Hsien Loong diagnosed Singaporeans with a certain "fussiness"; they "would not take jobs in less 'glamorous' areas like the marine sector."[230] This problem of modernity, of a "first world problem," is a moral problem: the comfort of modernity

229 Lee Huay Leng, "Too Much of the Good Life?", *The Straits Times*, August 4, 2002.
230 Edna Koh, "Graveyard shift? Only foreigners would do it?", *The Straits Times*, February 7, 2003.

is a kind of parent that only further spoils its children-citizens. Singaporeans who want for air-conditioning, office jobs, and higher wages are failed moral subjects.

But this targeting of Singaporean morality goes back even further: Lee Huay Leng's question must also be read in the context of what has been called the "Asian Values" argument. In this argument, Asian nation-states such as the four Asian Tigers (Hong Kong, Singapore, South Korea, Taiwan) succeeded because of their particular configuration of "Asian Capitalism," wherein an imagined "East," opposed to an imagined "West," is successful precisely because of those values that are essentially Asian: high-achieving, self-disciplined, communitarian, and family-oriented. This argument was employed by the Singaporean state just as it was taking down trade unions and slashing wages to create a cohesive national identity across racial lines (denouncing both labor and racial politics as nation-fragmenting practices, and enveloping everyone within the essentialism of Asia instead).[231] In this argument, too, the particular success of the Singaporean economy relies on one's disciplined regard for productivity while categorically rejecting the pleasures of modernity that that productivity brings.

Lee Huay Leng's moralizing of the air-conditioning is particularly interesting because, in this warning, an infrastructural system becomes something of the fetish object, reversing the strength of Asian Values: they become enraptured by air-conditioning itself, failing to keep working at the modernity behind it.[232] Like the fetish object, appearing as an independent being "endowed with life"[233] and a certain magic that dissimulates—or even enables the continuation of

231 See Ien Ang and Jon Stratton, "The Singapore Way of Multiculturalism: Western Concepts/Asian Cultures," *Sojourn* 10, no. 1 (1995): 65-89; and Tremewan, *The Political Economy of Social Control in Singapore*, 33.

232 One reading of this morality might be show that it follows a fetishist logic itself by "believing" in modernity. See Slavoj Žižek, "The Interpassive Subject," delivered at Centre Georges Pampidou, Traverses, 1998, https://zizek.uk/1998/01/01/the-interpassive-subject/.

233 Karl Marx, *Capital: A Critique of Political Economy, volume 1*, translated by Samuel Moore and Edward Aveling, edited by Frederick Engels (Moscow: Progress Publishers, 1887), 48.

—the relations behind it, the air-conditioning system here becomes the site of pleasures beyond its provision of comfort for productivity.

In an episode of a television show titled *Talking Point*, by Channel News Asia (CNA), a team of researchers help cool the home of a family—a single mother and two sons—living without an air-conditioning unit or the income to purchase and maintain the cost of keeping one on. The researchers, determined to avoid using the energy-inefficient air-conditioning unit, de-clutter the space, increase airflow, and bring in electric fans and an air-cooler. They manage to bring the ambient air temperature down by 2°C. When asked, finally, if the family felt that they still needed an air-conditioning-unit, the mother replies: "Oh, definitely with the aircon will be better. So that the boys can have a better night sleep."[234] Is it not evident here, with the invocation of that line of thinking—"the best for our children"[235]—that air-conditioning is, for those who use it *and* who do not have access to it, *more* than something that represents the productive efficiency of "national modernity"?—Or, rather, is there not something about air-conditioned modernity that is experienced as something important for the subject and her desires? What possibilities are there for attempting to explain air-conditioning's place in *this* field and how it came to be installed there?

**Migrant Workers in the Heat**

Before thinking further about these questions, an important asymmetry must be glossed: the differential access to air-conditioning units. As gestured to in the previous paragraph and section,

234 "Can We Beat The Heat Without Air-Conditioning? | Talking Point | Full Episode," *CNA Insider*, YouTube, uploaded July 1, 2024. https://www.youtube.com/watch?v=Mcv1zxfL960.

235 "That figural Child alone embodies the citizen as an ideal, entitled to claim full rights to its future share in the nation's good, though always at the cost of limiting the rights "real" citizens are allowed." Lee Edelman usefully also brings up questions of citizenship. Lee Edelman, *No Future: Queer Theory and the Death Drive* (Durham: Duke University Press, 2004), 11.

air-conditioning is expensive. Though 99% of condominiums and private housing, and around 80% of public housing units, have air-conditioning,[236] Singaporeans with lower-income, among them the most susceptible to the heat, are often the ones who do not have air-conditioning units in their home.[237] It therefore goes without saying that most migrant worker dorms, which are typically built at the cheapest cost available, are often left without air-conditioning units.

Jennifer Ferng deploys the term "climatic privilege" to name a structure in Singapore of which transnational worker's dormitories, "designed with little regard for the context of tropical climates, and often lack air conditioning or shaded outdoor areas," are an expression. "Climatic privilege," for Ferng, is an "operative category consisting of power structures, technologies, and legal definitions of residency that determine who may apply for specific types of housing, schools, and jobs."[238] Tying together the asymmetries of development and climate control, worker's dormitories, occupied by a majority of low-waged migrant workers, are often built on the premise that they will not be air-conditioned; this thermal asymmetry, for Ferng, is a demonstration of climatic privilege's unequal distribution. Further, Ferng's study of policy around these worker's dorms finds that their planning is chiefly concerned with hygiene, not comfort, pleasure, or sociality. These findings ring true: even when air-conditioning is mentioned in a Ministry of Manpower directive for migrant worker dorms, they are not mentioned as a requirement or even a recommendation; rather, they are only mentioned in the context of disease:

236 Even within this spaces, one might ask about who has access to air-conditioning: in Hong Kong, an employer of a migrant domestic worker locked the air-conditioning unit in the worker's room. Jun Pang, "Employer who prevented domestic worker from using air-con 'cyberbullied', says rights group," *HKFP: Hong Kong Free Press*, August 14, 2017. https://hongkongfp.com/2017/08/14/employer-who-prevented-domestic-worker-from-using-air-con-cyberbullied-says-rights-group/.

237 Derrick A. Paulo and Kenneth Lim, "How to beat the heat in Singapore, without air-conditioning," *CNA Insider*, July 13, 2024, https://www.channelnewsasia.com/cna-insider/beatheheat-singapore-without-air-conditioning-4475191; Chen, "This country's love affair with air conditioning shows a Catch 22 of climate change."

238 Jennifer Ferng, "Climatic Privilege and Transnational Labor in Singapore," *e-flux Architecture: Accumulation* (March 2021). https://www.e-flux.com/architecture/accumulation/378156/climatic-privilege-and-transnational-labor-in-singapore/.

"If air conditioning is provided in room, additional requirement, i.e. install a filter of at least MERV14 rating, to reduce transmission risks in enclosed areas."[239] Though these measures, enacted just a few month after Ferng's own article was published, address some of Ferng's points, the resonances of climatic privilege do not lose their conceptual edge and use; the measures were made after mismanagement of COVID-19 protocols in these dormitories that caused cases of the virus to skyrocket, and the measures only address dormitories built afterward: hence, the vast majority of migrant worker dormitories are "cramped rooms housing up to 30 men apiece, no air-conditioning or appropriate ventilation, bed bugs and cockroaches, and often just one filthy toilet shared by more than 80 people."[240]

**Thermostatic Desire and Biopolitics**

To frame the rest of the chapter, I would like to pose this question: if many Singaporeans see air-conditioning as "essential,"[241] then why is it generally accepted that migrant workers live in the heat? Further, in line with Jiat-Hwee Chang's question of disentangling heat from backwardness, how can different sociocultural thermal orientations be possible? This division between migrant workers and citizens, in the context of policy that names who will live in stifling dorms and who will not, is a textbook expression of biopolitical power, which serves ultimately to decide "who

239 Ministry of Manpower, "Improved Standards For New Migrant Worker Dormitories To Strengthen Public Health Resilience And Enhance Liveability," *MOM*, September 17, 2021. https://www.mom.gov.sg/newsroom/press-releases/2021/0917-improved-standards-for-new-migrant-worker-dormitories.

240 Sallie Yea, "This is why Singapore's coronavirus cases are growing: a look inside the dismal living conditions of migrant workers," *The Conversation*, April 29, 2020, https://theconversation.com/this-is-why-singapores-coronavirus-cases-are-growing-a-look-inside-the-dismal-living-conditions-of-migrant-workers-136959; and Kok Yufeng, "Improved standards for foreign worker dorms gain traction," *The Straits Times Online*, April 28, 2023. https://www.straitstimes.com/singapore/improved-standards-for-foreign-worker-dorms-gain-traction.

241 Shermaine Ang, "Are smartphones, air-con and short holidays essential? Many in Singapore say yes: Study," *The Straits Times Online*, July 12, 2024. https://www.straitstimes.com/singapore/are-smartphones-air-con-and-short-holidays-essential-many-in-singapore-say-yes-study.

may live and who must die."[242] To think more closely about heat in the context of the biopolitical, one useful place to start is Yuriko Furuhata's concept of "thermostatic desire"; for Furuhata, thermostatic desire is "a technophilic desire to posit atmosphere itself as an object of calibration, control, and engineering."[243] Part of this thermostatic desire, as Furuhata explains from the history of air-conditioning in the transpacific between Japan and the United States, is the deployment of air-conditioning in a double movement: microclimates keep becoming smaller in relation to humans, increasingly customized for individual comfort, while the infrastructure for this techno-logic involves larger and larger rooms of cooled machinery. This logic resonates with the way that I have described Singaporean national identity converging with air-conditioners, as Singapore too is today a hub for data centers.[244] For Furuhata, thermostatic desire scales from the micro to the macro, describing also geoengineering and weather control. Thermostatic desire also responds to the urge to create habitable environments in the climate crisis: "thermostatic desire manifests in both geopolitical and biopolitical motives to secure a livable future environment, either through engineering the atmosphere itself, or engineering built structures to protect certain populations from (and threaten others with) an increasingly inhospitable atmosphere."[245] Thermostatic desire can thus speak to the way air-conditioning operates in Singapore as a system of exclusion of undesired populations, an infrastructure that protects and threatens.

Furuhata is not concerned with this desire to manage the climate on the level of the

242 Achille Mbembe, "Necropolitics," translated by Libby Meintjes, *Public Culture* 15, no. 1 (2003): 11.
243 Yuriko Furuhata, *Climatic Media: Transpacific Experiments in Atmospheric Control* (Durham: Duke University Press, 2022), 2.
244 Clay Chandler and Nicholas Gordon, "How Singapore became a data center hub despite its small size, expensive energy, and hot climate," *Fortune*, August 2, 2024. https://fortune.com/2024/08/02/singapore-data-centers-ai/.
245 Furuhata, *Climatic Media*, 2–3.

subject: "My approach, by contrast, puts less emphasis on the affective and sensorial processes of subjectivization and focuses instead on the intersections of scientific, architectural, and artistic deployments of the physical atmosphere."[246] Further, thermostatic desire is part of a broader biopolitical genealogy: "The genealogical roots of this thermostatic desire [...] trace back to the geopolitics of territorialization and mathematical thinking."[247] Furuhata's thermostatic desire speaks to and expands Foucauldian biopolitics; it is in line with the idea that biopower "tries to control the series of random events that can occur in a living mass, a technology which tries to predict the probability of those events."[248] Biopower and thermostatic desire describe an investment in knowing the future: thermostatic desire finds its genealogical ground in the history of prediction and cybernetics. For Foucault, biopower arises from a problem of governance: the techniques of sovereignty "found itself unable to govern the economic and political body of a society that was undergoing both a demographic explosion and industrialization."[249] Furuhata's account of thermostatic desire coheres with this explanation: transpacific histories of climate control yield, in governance, perceived needs for prediction and management.

These are not answers on the level of the subject, but ones that question, rather, the configuration of knowledge and the production of truth. Furuhata is interested in air-conditioning as a technology and technique in a specific sense: "what we can broadly call technology" is "a technique of intervention which consisted in applying to society and the economy a type of rationality considered valid within the natural sciences."[250] For Foucault, it is these questions that shed light on the movements by which power takes shape in society, and *not* questions about

246 Furuhata, Climatic Media, 7–8.
247 Furuhata, *Climatic Media*, 79.
248 Michel Foucault, *"Society Must Be Defended": Lectures at the Collège De France, 1975-76*, eds. François Ewald and Alessandro Fontana, trans. David Macey (New York: Picador, 2003), 249.
249 Foucault, "Society Must Be Defended", 249.
250 Foucault, *The Birth of Biopolitics*, 115.

tracking the "deeper" shape of desire or repression.[251] Writing about the "problem of the subject" in a foreword to *The Order of Things*, Foucault writes that he tries "to explore scientific discourse not from the point of view of the individuals who are speaking, nor from the point of view of the formal structures of what they are saying, but from the point of view of the rules that come into play in the very existence of such a discourse."[252] Thus, the problem of the subject is a non-problem: what is at stake, rather, the conditions of possibility of how the subject thinks and acts. As Arun Agrawal writes, in Foucault "[t]here is little or no indication of how government shapes subjects or how one is to explain variations in transformations of subjects."[253]

Such a conceptual apparatus is useful in describing the thermostatic desire behind air-conditioning as, for example, a technology and technique that affords the possibility of a biopolitics that wants to distinguish between those who can keep themselves in comfort and those who are not able to—a type of what Nicole Starosielski terms "thermal violence."[254] It might also be possible, through biopolitics, to suggest that what is "really" at the heart of air-conditioning is a question of a technological rationality in the service of productive capitalism. This line of thinking being generative and useful, I am nonetheless interested in how one can respond to the two questions I posed earlier. To rephrase slightly: *how* is it that Singaporeans *come to accept*, at one and the same time, that Singapore is too hot for them and their children and that it is generally inconsequential that migrant workers live and work in the heat? And, thus,

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251 See Michel Foucault, *The History of Sexuality, vol. 1*, trans. Robert Hurley (New York: Pantheon Books, 1978).

252 Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Routledge Classics, 2002), xiv.

253 Arun Agrawal, *Environmentality: Technologies of Government and the Making of Subjects* (Durham: Duke University Press, 2005), 12.

254 On (cultural) techniques as making distinctions, see Bernhard Siegert, *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real*, translated by Geoffrey Winthrop-Young (New York: Fordham University Press, 2015). See also Nicole Starosielski, "Beyond the Sun: Embedded Solarities and Agricultural Practice," *The South Atlantic Quarterly* 120, no. 1 (2021): 13–24.

what are the obstacles to change? Thinkers in line with Foucault do not think deterministically: words like resistance, agency, intervention, abound. In his preface to Deleuze and Guattari's *Anti-Oedipus*, Foucault writes, as an "ethics": "Prefer what is positive and multiple, difference over uniformity, flows over unities, mobile arrangements over systems."[255] But these kind of answers necessarily remain unsatisfying and pass over in silence when it comes to questions about how it is that one can exert such a preference or the psychic mechanisms the subject requires to stop themselves from being "enamored of power"[256]—what is it that performs the operation by which something is *turned into* a power structure, "activating it as a power"?[257] After all, as Judith Butler puts it, "if, following Foucault, we understand power as *forming* the subject as well, [...] then power is not simply what we oppose but also, in a strong sense, what we depend on for our existence."[258] It is my gambit that concomitant with Furuhata's deployment of the term "desire" is something, implicit in a biopolitical framework (a supplement, but perhaps also central to its operations[259]), that resonates with psychoanalytic thinking; there is something to be said here for the possibility of an account of thermostatic desire as an important way of considering the desirous subject, extending a psychoanalytic concern with desire to thermal politics. I will explore this possibility through the consideration of the function of the screen as an apparatus in film theory.

**Air-Conditioned Thermal Modernity and the Glass Window**

Lee Huay Leng furnishes a useful image of "big glass panels [that] allow commuters to see the

255 Michel Foucault, preface to *Anti-Oedipus: Capitalism and Schizophrenia*, by Gilles Deleuze and Felix Guattari (New York: Penguin, 2009), xiii.
256 Foucault, preface to *Anti-Oedipus*, xiv.
257 Alenka Zupančič, "Biopolitics, Sexuality and the Unconscious," *Paragraph* 39, no. 1 (2016): 62.
258 Judith Butler, *The Psychic Life of Power: Theories in Subjection* (Stanford: Stanford University Press, 1997), 2.
259 See also Zupančič, "Biopolitics, Sexuality and the Unconscious.'

view outside, knowing that it is scorching hot out there." Glass windows are part of an architectural modernity in Singapore that Jiat-Hwee Chang and Tim Winter term an "air-conditioned thermal modernity." In thermal modernity, buildings are built on the premise that they will be cooled, with few openings to limit unwanted hot air from getting in (ideally, the only air that gets in is air that the air-conditioner cools and dehumidifies). These buildings stand in contrast to "naturally-ventilated" buildings, which characterizes many buildings before, and in the early stages of, air-conditioners' appearance in Singapore.[260] Naturally-ventilated buildings were built to take advantage of airflow and ventilation, and cooled by working with the environment outside. Air-conditioned buildings, on the other hand, had few windows to keep heat out and thus created an urban environment where buildings appeared closed-in from the street outside. When the Urban Redevelopment Authority in Singapore suggested that such buildings were detrimental to "street life," this, alongside a broader wish to appear "modern," led to the proliferation of glass windows and curtain walls.[261]

The curtain-walled, glass windowed prismatic skyscrapers of modernity are "today a stable entity widely replicated throughout the world," a ubiquity that elides both its origins and the effects such form still has on the world: Daniel Jütte traces the modern high rise, in which 80% of the facade is covered by glass, to Chicago-based architects in the early-20th century.[262] Small wonder, then, that such an architectural format, which also proliferated with the ideas of Le Corbusier, would both be tied to the idea of Euro-American modernity as global modernity and thus efface the fact that, particularly in the tropics, these not-so-global buildings necessitate

260 Jiat-Hwee Chang and Tim Winter, "Thermal Modernity and Architecture," *The Journal of Architecture* 20, no. 1 (2015): 100.
261 Chang and Winter, "Thermal Modernity," 115.
262 Jiat-Hwee Chang, "'A Looming Cold Crunch' and the Contingencies of Transnational Air-Conditioning," *Ardeth* 6 (2020): 243; Daniel Jütte, *Transparency: The Material History of an Idea* (New Haven: Yale University Press, 2023), 312.

the heavy use of air-conditioning.[263] Though many—particularly in gulf states and tropical climates like Singapore, and in the context of rising temperatures worldwide—are today attempting to find solutions that would forgo reliance on the glass curtain wall building, difficulties abound: the fact that the narrow range of comfort conditioned by air-conditioning means that many indoor temperature norms for machines and things require those temperatures to work; the association of temperature control with a certain socio-economic standard (Chang and Winter describe air-conditioned thermal modernity's future as concerned with energy use, yet still dependent on air-conditioning[264]); and, as Chang argues, the very problematic of posing tropical heat as a problem to be solved.

The proliferation of such buildings everywhere today has necessarily led to the proliferation, globally, of another kind of material: *glass*. A crucial component in glass and so-called "land reclamation" projects, Singapore imports huge amounts of sand from the neighboring countries from which Singapore also gets much of its labor.[265] Though Singapore is a major manufacturer of float glass, the sand that goes into making this glass must be supplied. Glass, one enabling condition of a specific experience of modernity in which one is inside "knowing it is scorching hot out there," repeats the movement of migrant labor; further, because it is largely migrant labor behind the glass buildings, glass can also stand as a reminder of the very impossibility of a modernity without cheap labor and the figuration concomitant with it.

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263 Jütte, *Transparency*, 312.

264 Chang and Winter, "Thermal Modernity," 116–18.

265 See Charlotte Gifford, "Creating a sustainable sand industry requires greater regulation – here's why," World Finance, accessed December 7, 2023, https://www.worldfinance.com/featured/creating-a-sustainable-sand-industry-requires-greater-regulation-heres-why; Andy Lehren, "Global sand trade figures don't add up," Beneath the Sands, May 4, 2023, https://www.beneaththesands.earth/supply-chain; and Ananda Teresia and Bernadette Christina, "Boon for Singapore as Indonesia scraps ban on sea sand exports," *Reuters*, May 29, 2023, https://www.reuters.com/markets/asia/boon-singapore-indonesia-scraps-ban-sea-sand-exports-2023-05-29/.

This relationship between labor, materials, and architecture speaks to Giuliana Bruno's call to "pay attention to the pleats and folds that constitute the fabrics of the visual."[266] But the "visual" that Bruno speaks of goes beyond the architectural; this call is also a reminder that glass is bound up with histories of transparency, visuality, and screens that are the domain of art history, film, and visual studies. A significant part of these considerations begin from glass' transparency: more than glass being transparent, the very notion of transparency often takes glass as its signification.[267] Perhaps the most obvious starting point to this relationship is the history of the entanglement between the window and the screen: Anne Friedberg points out that "[t]he window reduces the outside to a two-dimensional surface; the window becomes a screen. Like the window, the screen is at once a surface and a frame."[268] Francesco Casetti suggests that the "window" is a major metaphor for a screen that is "essentially a terminus from which we gather data from outside."[269] These histories often draw on the history of vanishing-point painting that often traces one of its roots to Leon Alberti's *De Pictura*, wherein the screen appears to render the world "outside," an outside that might signify another world altogether.

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266 Giuliana Bruno, *Surface: Matters of Aesthetics, Materiality, and Media* (Chicago: University of Chicago Press, 2014), 4.
267 Jütte, *Transparency*, 5.
268 Friedberg, *The Virtual Window*, 1.
269 Francesco Casetti, *The Lumière Galaxy: Seven Key Words for the Cinema to Come* (New York: Columbia University Press, 2015), 160.

Figure 7. Uniformed workers on the roof of a building next to mini-split system air-conditioning units, Singapore, January 2022. Photo: Unsplash, under the Unsplash License.

**Screens, Stains, Subjects**

In what follows, I would like to begin from a somewhat speculative position, and, to invert the usual posing of screen-as-window, think instead of the window as a screen. In the image of the Singaporean who looks at a hotter world outside from a cooler world inside, what is missing are two things: first, the visibility of the *window itself*. Friedberg argues that the specific association of glass with transparency is a retroactive transposition of glass onto the window as a metaphor in Alberti, when it is unlikely that Alberti had such a plainly transparent window.[270] Windows are often anything but transparent: they are scuffed, stained, marked, they might have shutters, blinds, and curtains; sometimes, there is condensation. The other thing missing is that the heat "out there" is not uninhabited but often occupied by workers, many of whom are actually, in a kind of "primal scene," making the kinds of buildings from which one watches (see figure 7).[271] These are migrant workers, not as unmarked people, but as *figures* of unmodernity, of invasion, of something to be scared of. These two things missing represent a more figurative kind of condensation the glass window performs: the figure of the migrant worker and the perceptible window are coded over with national history, which is itself written over by thermal fears and desires.

This speculative image, in which a person in the cool air, either a citizen or someone who has access to lines of citizenship, looks out at a glass window and sees migrant workers working outside, might be thought of as an image of a spectator and a screen: my contention is that through spectatorship, thinking in film studies about modes of looking—of the gaze—can serve

270 Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley: University of California Press, 1993), 61.

271 For Freud, the primal scene is a child's fantasy of their conception. See Sigmund Freud, "From the History of an Infantile Neurosis," *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XVII (1917-1919): An Infantile Neurosis and Other Works,* 1-122 (London: The Hogarth Press, 1955).

to answer the questions I posed between subjectivity and biopower. Though such an image does not take place in a cinema, its association with the act of looking, and its quasi-cinematic space —for a cinema is often an air-conditioned space—invokes early thinking about cinematic spectatorship and the "apparatus" of cinema.

For Jean-Louis Baudry, the crux of the cinematic apparatus lies in the production of a transcendent spectator who does not identify with the representation so much as the operation of making this representation coherent, unfragmented:

> because the reflected image is not that of the body itself but that of a world already given as meaning, [...] the spectator identifies less with what is represented, the spectacle itself, than with what stages the spectacle, makes it seen, obliging him to see what it sees; this is exactly the function taken over by the camera as a sort of relay.[272]

Baudry here, following the ideas of Louis Althusser and Jacques Lacan, maps a kind of Freudo-Marxist account of the apparatus as a kind of material base for ideological operations: the cinema-goer is like a child who, with limited mobility and a maturation of visual organization, sees themselves in the screen-mirror as an imaginary "I" disjointed from their bodily experience and in an imaginary order of unity, a relationship taken from Lacan's thinking about the "Mirror Stage."[273] Indistinguishable from claims about Renaissance single-point perspective—as Baudry admits: "it is the perspective construction of the Renaissance which originally served as a model"[274]—Baudry's claim is that the spectator identifies with an operation of visuality that makes things completely coherent. Therefore, closely following Althusser's thesis that "[i]deology has a material existence," Baudry dismisses any question of the representations on

272 Jean-Louis Baudry, "Ideological Effects of the Basic Cinematographic Apparatus," In *Narrative, Apparatus, Ideology: A Film Theory Reader*, edited by Philip Rosen (New York: Columbia University Press), 294.
273 See Jacques Lacan, "The Mirror Stage as Formative of the I Function as Revealed in Psychoanalytic Experience," in *Ecrits*, trans. Bruce Fink, 75–81 (New York; London: W. W. Norton, 2006).
274 Baudry, "Ideological Effects," 289.

the screen—these are "of little importance."[275]

The kind of model that Baudry offers would ask that I return to the very objects that constitute the world around the Singaporean spectator in the air-conditioned building, and to notice the way that world is constructed. Notice, however, that such an operation is not dissimilar—though in importantly different terms and with different resonances—to the operations of Foucauldian biopolitics that stresses the importance of tracing the forms of power. If the subject "identifies with" the apparatuses that constitute their world, they become self-same with it. In such a model, the distinctions between hot and cold, inside and outside, migrant worker and non-migrant worker that air-conditioning provides is stamped neatly onto subjectivity. This line of reasoning fails to account for how things might *not* be this way or why a subject *necessarily* accepts the apparatus/infrastructure as their own; instead, it mirrors Foucault's concern with the rules that govern the subject: elsewhere, Foucault argues that "[i]f power takes hold on the body, this isn't through its having first to be interiorised in people's consciousnesses."[276]

As Baudry failed to provide any account of the subject other than an ahistorical thing onto which ideological operations are stamped, his account fell into disrepute: such competing accounts of film spectatorship as Laura Mulvey's "Visual Pleasure and Narrative Cinema," underscoring the underlying historically specific positioning of man as the "bearer of the look" (and, asymmetrically, women as its object) would attempt to correct these notions of spectatorship.[277] But is it possible that this kind of intervention does not shift the coordinates of

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275 Louis Althusser, *On the Reproduction of Capitalism: Ideology and Ideological State Apparatuses*, translated by G. M. Goshgarian (London: Verso, 2014), 184; Baudry, "Ideological Effects," 295.

276 Michel Foucault (Interview), "The History of Sexuality," interview by Lucette Finas, in *Power/Knowledge: Selected Interviews and Other Writings, 1927-1977*, ed. Colin Gordon and trans. Colin Gordon, Leo Marshall, John Mepham, and Kate Soper (New York: Pantheon Books, 1980), 186.

277 Laura Mulvey, "Visual Pleasure and Narrative Cinema," in *Visual and Other Pleasures: Language, Discourse, Society*, 14-26 (London: Palgrave Macmillan, 1989).

Baudry's original thinking? For Joan Copjec, if, as feminist film theorists in line with Mulvey would have it, the woman as object to be seen "carries her own Panopticon with her wherever she goes, her self image a function of her being for another,"[278] then "[the panoptic] structure thereby guarantees that even her innermost desire will always be not a transgression but rather an implantation of the law."[279] Copjec is making the case that such an intervention only puts faces (sexes) to positions in the apparatus without changing the assumptions of how subjects are constituted within it; in such a reading even the "objects" (women) are still nonetheless produced by the apparatus, meaning that "her innermost desire will always be [...] an implantation of the law." If the screen is like a panopticon—Jeremy Bentham's prison that was taken up by Foucault as a model for a disciplinary society—and there is a gaze, either that the subject occupies or through which is rendered totally visible, then everything the subject does, including desire, makes the subject knowable, knowing, mastered, or master.

And, while Foucault's ethics of resistance through multiplicity is echoed in such interventions—in the multiplication of subject positions—this ethics is difficult to square with Foucault's other work on power and knowledge: is it possible to think that such a multiplication could instead act as so many more determinations through which subjects are known? (This latter response is the upshot of Copjec's position.[280]) How can one know what a good multiplicity is? To rethink the problematic that Baudry presents, Copjec goes instead to Lacan. For Copjec, the difference between the "properly" Lacanian position and Baudry's amounts to a great deal of film scholarship that has misread Lacan (though how charitably Copjec reads this scholarship is

278 *Re-vision: Essays in Feminist Film Criticism*. Edited by Mary Ann Doane, Patricia Mellencamp, and Linda Williams. (Frederick, MD : University Publications of America, 1984), 14.

279 Joan Copjec, *Read My Desire: Lacan Against the Historicists*, (Verso, [1994] 2015). 17. Copjec continues: "even the 'process of theorizing her own untenable situation' can only reflect back to her 'as in a mirror' her subjugation to the gaze."

280 Copjec, *Read My Desire*, 18. See also the introduction to this thesis.

another question[281]) to the detriment of theorizing the subject. Copjec's argument is that by failing to get away from this version of the operation of subjectivization, which sees the subject totally rendered visible, "an early misreading of Lacan turned him into a 'spendthrift' Foucault, one who wasted a bit too much theoretical energy on such notions as the antithetical meaning of words, or repression, or the unconscious."[282] Or, put another way, why bother to talk of "subjects" if all subjects do is be stamped with apparatuses?

Lacan elsewhere speaks as if directly against this stamping. For Lacan, "I [the subject] am not simply that punctiform being located at the geometral point from which the perspective is grasped. [...] And if I am anything in the picture, it is always in the form of the screen, what I have earlier called the *stain*."[283](My emphasis.) This decisive statement by Lacan means, argues Copjec, that Lacanian psychoanalysis cannot be used "to support the argument that the cinematic apparatus [...] produces a centered and transcendent subject."[284] In Lacan's account of subjectivity, the subject, who exists in the symbolic order of language, retroactively (knowing it or not) feels in this symbolic order that something—a pre-symbolic existence that involves feelings of total coherence and competeness—has been lost.[285] Compared to the lost coherence, language, that which ultimately comprises the symbolic world for Lacan, is perceived as always having paucity, lacking something, an imperfection: this absence is inherent to the work of

281 "Although Copjec may have correctly diagnosed the elision that many film theorists have made between Foucauldian and Lacanian theories, she rather ungenerously misreads some specific film theorists—Metz, Baudry, and Comolli—to charge them with the "ignorance of" the 'true' Lacan." Friedberg, *Window Shopping*, 260.

282 Copjec, *Read My Desire*, 19. On this question, see also Zupančič, "Biopolitics, Sexuality and the Unconscious."

283 Jacques Lacan, *The Four Fundamental Concepts of Psychoanalysis*, ed. Jacques-Alain Miller and trans. Alan Sheridan (London; New York: W. W. Norton, 1981), 96–97.

284 Copjec, *Read My Desire*, 32.

285 "The subject is an apparatus. This apparatus is something lacunary, and it is in the lacuna that the subject establishes the function of a certain object, qua lost object. It is the status of the objet a in so far as it is present in the drive." Lacan, *The Four Fundamental Concepts of Psychoanalysis*, 185.

signification itself.[286] Any kind of signification, any ideological operation of an apparatus, is therefore believed by the subject to *fail* to represent them: "language's opacity is taken as the very cause of the subject's being, that is, its desire, or want to be."[287] This relationship to desire might manifest as a kind of narcissism (which is an ethical judgment, although Copjec does not explicitly pose it as such): "narcissism cannot consist in finding satisfaction in one's own visual image. It must, rather, consist in the belief that one's own being exceeds the imperfections of its image."[288]

In effect, the subject is not founded by the ideological apparatus that masters the world and thereby reflects their coherence and perfection in the law (or their capture by it that nonetheless buttresses it). In this framework, the subject is founded at the "stain," a point of failure where the image (as a symbolic system) apparently fails to reflect them and destabilizes the subject: "The subject is the effect of the impossibility of seeing what is lacking in the representation."[289] In a defensive position, the coherence-seeking subject attempts to exclude imperfections (this kind of orientation to the world would then characterize the subject of Baudry's reading). Imperfections produce a subject of an internal contradiction and division: the symbolic world does not afford them the transcendental coherence, the affective "oceanic feeling" associated in classical psychoanalysis with the mother's breast.[290] In this line of thinking, it makes sense that imperialist and violent determinations have at their heart a

286 "Language creates a significant world to which we can relate, but it also makes evident the division of this world from itself. The signifier is not identical with the signified." Todd McGowan, *Capitalism and Desire: The Psychic Cost of Free Markets* (New York: Columbia University Press, 2023), 25. "[T]he subject as such is uncertain because he is divided by the effects of language. Through the effects of speech, the subject always realizes himself more in the Other, but he is already pursuing there more than half of himself." Lacan, *The Four Fundamental Concepts of Psychoanalysis*, 188.

287 Copjec, *Read My Desire*, 35.

288 Copjec, *Read My Desire*, 37.

289 Copjec, *Read My Desire*, 35.

290 See the first pages of Sigmund Freud, *Civilization and its Discontents*, translated by David McLintock (London: Penguin Books, 2004).

figuration that externalize and internal contradiction, as these figurations are those stains where the production of meaning is founded.[291] What is not determined, however, is the necessity of singular violence against figurations; to suggest that all subjects are narcissistic would repeat the notion that they are self-same with their apparatuses, a version of Foucault with far too many steps.

**Climatic Citizenship and Thermostatic Conscience**

I am posing as stains both the irreducible visibility of the glass window screen, which obstinately refuses an illusory transparency of the world outside, and the figure of the migrant worker, who always already appears as a *figure*. In this reading, while the biopolitical exclusionary techniques of air-conditioning in Singapore do signify a kind of thermostatic desire, this thermostatic desire is operative at the heart of the subject. Put another way, an infrastructure's possibility of failure —a broken air-conditioning unit leading to sleeping in the heat—relates to the subject's failure of coherence—their attachments to modernity, privilege, citizenship. As a figure, the migrant worker takes on all sorts of contradictions—indeed, perhaps on the order of what Lacan takes to be "fundamental" linguistic and symbolic contradictions of meaning, but also those found in the pains of modernity sketched out in this chapter: by being in the heat, they smooth over contradictions of the inequitable access to cool air; by being infectious bodies, they preclude thinking about the reason they are there in the first place. The thermostatic desire for air-conditioning, to manage the air, is always in differential relation to the figure outside. The subject of climate citizenship, by definition, cannot be a migrant worker. Because of this non-

291 Slavoj Žižek, argues that anti-semitism operates on this logic. Slavoj Žižek, *The Sublime Object of Ideology* (London; New York: Verso, 2008): 48-51.

being and the suggestion that they are "scary" or that they and the work they do are "dangerous," they are a certain kind of failure; they are, in Julia Kristeva's term, "abjected": "Abject. It is something rejected from which one does not part, from which one does not protect oneself as from an object. Imaginary uncanniness and real threat, it beckons to us and ends up engulfing us."[292] Robbie B. H. Goh, though not explicitly referencing Kristeva, uses the term in a literal manner to describe the position migrant workers occupy as abjected from nationality. For the functioning of Singapore's biopolitics, affective operations are required: migrant workers are markers of fear and disgust, while the air-conditioner brings comfort. The film theory I draw on helps to view this relation visually: it is a kind of spectator wrought in an affectively-tense relation with the stained figure of the migrant worker on the glass window screen. But, as gestured to in the previous paragraph, this characterization does not take one further than the possible determination identified in Foucauldian biopolitics: nonetheless, the focus on affect opens this line of thinking.

Climatic citizenship, in my reading, is therefore an "affective citizenship": it involves belonging based on feelings about how the world *should be*, and feelings about that which is figured as an obstacle to that vision of the world. It is not just a set of biopolitical forms, but also "the affect that makes these forms meaningful."[293] Isabel Phua, the activist I referenced earlier, called for Singaporeans to go against their "fear" of the migrant worker. Might this not-very-radical call, which locates fear as being bound up with *the conscience* of a subject of climatic citizenship, be an important point for thinking about how it is that things might be different, that one is not determined in how they reflect on their feelings? To finally answer this question, a

292 Julia Kristeva, *Powers of Horror: An Essay on Abjection*, trans. Leon S. Roudiez (New York: Columbia University Press, 1982), 4.

293 Lauren Berlant, *The Anatomy of National Fantasy: Hawthorne, Utopia, and Everyday Life* (Chicago: The University of Chicago Press, 1991), 4.

brief return to Foucault and Copjec is useful. For Foucault, because repression is a *positive and productive* operation, the negativity of Freud's repression is superfluous.[294] No desire, involving a lack and a negativity, precedes the law: any other formulation would be ahistorical. Copjec argues, however, that in this reading conscience becomes a sticking point: "[w]hat becomes suddenly inexplicable is the very experience of conscience—which is not only the subjective experience of the compulsion to obey but also the experience of guilt, of the remorse that follows transgression."[295] That is, what can one say about the *affective* dimension of conscience—self-policing and its satisfaction, guilt and the pleasure of guilt? Foucault, interestingly, ultimately poses the question of choice in similar sensuous terms; a choice is irreducible to other reason beyond pleasure and pain: "The choice-between painful and non-painful is a sort of irreducible that does not refer to any judgment, reasoning, or calculation."[296]

I want to reframe thermostatic desire in the terms of the subject according to this account of conscience and with a more careful attendance to the dimensions of meaning and affect implicit in it; in other words, I would like to account for thermostatic conscience. Fear of the image of the migrant worker is the biopolitical affective "law" of climatic citizenship; in other words, climatic citizenship implies a conscience that regards exclusion as that which *must be*. The infrastructure of air-conditioning brings the failure "out there." If the imperative is to find new "relational modes"[297] of being in the heat that can affirm the possibility of a conscience that *feels* otherwise, what obstacles are in the way, how might such operations be effected, and what might such modes look like? To attempt an answer, I want to provide something of a personal

294 See Foucault, *The History of Sexuality*.
295 Copjec, *Read My Desire*, 25.
296 Foucault, *The Birth of Biopolitics*, 272.
297 These are the terms of Foucault's "ethical project." See Leo Bersani, "Sociality and Sexuality," *Critical Inquiry* 26, no. 4 (2000): 641-656

account of my experiences with the sculpture of the snowman with which I began this too-long chapter.

I had some trouble finding the statue outside of the mall it was in, for I could not see a sign for a snowman, and I was probably the first person to have ever sought one out. After some speed-walking through the air-conditioned interior, too cold in my shorts and T-Shirt (which had been perfect dress for the outside), I finally managed to walk out of the correct exit (there were many) and was greeted by the snowman's behind, towering over me and the world around it. Gazing up, I caught sight of its carrot nose poking out, and I broke into laughter at the too-tall, strange, and stupid thing: how banal and kitschy it looked, and how absurd I felt chasing it down. I tried thinking, in that moment, of the seriousness of the statement that such a statue could "symbolize the triumph over nature as they stand frozen in tropical Singapore," and I laughed even harder.

Indeed, as Georges Bataille writes, from such narrative dramatics as the *triumph over nature*

> comes an element of comedy, of foolishness, that tums into laughter. If we didn't know how to dramatize, we would not know how to laugh, but in us laughter is always ready, which makes us burst into a renewed fusion, once again shattering us in the play of errors committed in wanting to shatter ourselves, but this time without authority.[298]

I want to suggest that other affects are made available *through* interrogating, sticking with, the seriousness of a biopolitics that figures certain bodies for fear and disgust. The experience of imperfection and fear is not a neutral, uncoded ground; however, as exceptional affective experiences in cool comfort where a subject is required to exercise the biopolitical role dictated to them, the very gap between affect and action reveals itself as indeterminate. It is at these

298 Georges Bataille, *Inner Experience*, translated by Stuart Kendall (Albany: SUNY Press, 2014), 18.

moments that multiplicity, the knowledge of other subject positions, is important: they demonstrate that figurations are only figures, for one person's infrastructure might be another person's difficulty and the shape of our affective relations are not determined. In the scope of re-coding how one feels about the heat in the tropics, then, it is not that one just has to, as Horn suggests, simply step outside; instead, let the experience of being in the uncomfortable heat be an affective guide in reflecting on how one is asked to be comfortable again, for indeterminacy means that such a decision is not a natural one. In such a reflection, or even extension of the time of decision, the singular violence of defensive narcissism against the figure of failure is avoided, or at least deferred. Even if what you find is not always a non-sovereign laughter fit for the operations of the overly serious nation state, what always threatens the biopolitical operations of climatic citizenship are moments where the over-serious, over-determined dramatics of things that disavow the contingency of their formation become exposed in their impotence—we just have to be there for it.

## Conclusion

## The Infrastructural Relation

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> I can laugh or cry; nobody cares. Or I may
> nap and wait to be woken up when the train
> finally stops. If I'm not dead, I'd smile and apologise.
> I'd thank them when they ask me politely to go.
>
> —Cyril Wong, "My Grandmother Takes the M.R.T. for the First Time"

The "infrastructural relation," as the singularity of the noun fails to disclose, does not take one form but many. However, I would not describe this "many" as a kind of multiplicity that is justified because it multiplies, an idea that I worked through in the introduction to this thesis (and in the final section of the previous chapter) with reference to questions of determination, agency, and the subject. Instead, in this thesis I have tried to hold onto what I see as what is compelling about approaching infrastructure; namely, it is a "call to study boring things," as Susan Leigh Star puts it.[299] Star writes that "[i]t takes some digging to unearth the dramas inherent in system design creating, to restore narrative to what appears to be dead lists."[300] If this proposition describes what "infrastructuralism"[301] is, it is also somewhat tricky. It is not only that drama might be "inherent" to infrastructure, or that the task of humanities scholars has been to reveal/tell stories about infrastructures that have heretofore been thought about as boring or non-narrative; rather, infrastructuralism is work that demonstrates how infrastructures set the conditions of drama and narrative.

The infrastructural relation, then, is a singular noun because there is a certain singularity

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299 Susan Leigh Star, "The Ethnography of Infrastructure," *American Behavioral Scientist* 43, no. 3 (1999): 377.
300 Star, "The Ethnography of Infrastructure," 377.
301 See the introduction to this thesis and John Durham Peters, The Marvelous Clouds (Chicago: The University of Chicago Press, 2015), 33.

in its operation as that which gives form to the "formless,"[302] setting the conditions within which one is able to move around the world; thus, in the introduction, I describe infrastructures as that which enable action in the face of non-knowledge. All the same, as this thesis has shown, the conditions that infrastructures set are not absolute conditions: they enable because of a kind of self-referentiality that takes stock of the fact that infrastructures *fail*, and in doing so, open up to variations on the form of the infrastructural relation. In chapter 1, I discuss this failure in relation to the affective experience of it. In the model of infrastructure that chapter gives, failure and its experience seem not only to be given as possibilities after infrastructures are made, but as some kind of negative inclusion in the construction of infrastructure, which nonetheless seem to appear as the base, or infra, of infrastructure. In chapter 2, a number of failures are linked to a failure of closure in the subject. There, I proposed that failures across modernity, architecture, global capitalism, and the subject were *homologous*: this term, different than something like "similar" or "parallel," points, with an inflection from anthropology or biological science, to the idea that they share a similar something—that their failures were, in a sense, the same failure. Drawing from a Lacanian perspective that brings together subjective experience (including affective experience) and signifying logic, this thesis located that same failure as characteristic of the operation of subjectivization.

The infrastructural relation might be thought of as the site where something like failure is negotiated, because infrastructures, as that which attempt to sublimate, capture, or disavow failure—as when NEWater attempts to make drinking water a nation-affirming activity premised on the assurances of science and technology or when air-conditioning creates a climate in which

302 See Georges Bataille, "Formless," in *Visions of Excess*, trans. Allan Stoekl (Minneapolis: University of Minnesota Press, 1985), 31.

migrant workers can become figures for multiple failures—therefore also require that failure in order to "become" infrastructural, to be activated as infrastructures. In the readings of failure that I have proposed, it is also the affective experience of failure that makes infrastructure indeterminate. In both chapters, I have suggested some way of attempting to stay in closeness with this experience as a means of "loosening attachments,"[303] sticking with the breakdown of things as a practice, hinging on an affective experience, that attempts to re-code the potentially violent relations, dramatics, and narratives that might inhere in boring things.

The infrastructural relation finds the grandmother of Cyril Wong's poem, introduced in the first chapter, in a strange position. While at the beginning of the poem she is all-too-aware that she is out-of-joint with the world, prompting her to wish for nicer flats or to join the speed of the capitalist workforce, the end of the poem positions her at a different place in relation to her failure to be part of the world that a fast train produces: "I can laugh or cry; nobody cares. Or I may / nap and wait to be woken up when the train / finally stops. If I'm not dead, I'd smile and apologise. / I'd thank them when they ask me politely to go." The idea that one could loosen one's attachment to infrastructure might take the grandmother as a model: the attempt on the part of global capitalist infrastructure to determine subjects as subjects who need capitalism, fixing their desires to be self-identical with the commodity-form, requires an acknowledgment of those fantasies, as in the grandmother's urges to be fast. In the space of this recognition, failure, the cause of desire and site of determination, becomes indeterminate by virtue of the fact that such fantasies could not be recognized as fantasies if they determined absolutely. The grandmother's seeming apathy by the end of the poem might therefore be understood better through the kind of movement of indeterminacy this thesis has proposed: the grandmother does nothing but propose

303 See Lauren Berlant, *Cruel Optimism* (Durham: Duke University Press, 2011).

a series of hypotheticals and conditionals; such an act is not to dream about closing the possibility of future failures, but to think about what position one would like to take toward failure itself, and thus what infrastructures might effect those positions. In this space of indeterminacy between failure and fantasy, one already removes oneself from any determinist logic that would have you accede to biopolitics: the infrastructural relation is a *relation*, which is therefore a *separation*, a scene of non-identity.

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