3 ENVIRONMENTAL IMAGINARIES

Noise pollution is a product of the 1960s. By this, I mean that the notion of noise as pollution was formulated and took hold during a particular period. The story of noise pollution in the United States begins in the 1950s, the term seemingly first used to refer to sound inside the home. By the late 1960s, *noise pollution* had emerged as a viable and motivating category, noise as an environmental issue newly coordinating the politics of aircraft noise, work on noise and health, noise control engineering, and workplace safety. Noise pollution is conjured in and through encounters between historically specific experiences and formulations of noise and of pollution—encounters between sometimes incommensurate fields in which their friction is minimized, softened through the suturing of differences, through hierarchizations of matterings. The ability of a notion of noise pollution to take hold relies on also then emerging conceptual fields, political mobilizations, sounds, and sensory experience. These include conceptualizations of pollution, atmosphere, and the environment; a renewed focus on privacy;

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the sounds of airplanes, trucks, and household appliances; the annoyance caused by those sounds; and a growing insistence on the possibility of controlling noise on the part of acoustical engineers, building material manufacturers, and urban planners.[1]

In being designated *pollution* rather than *nuisance*, noise shifts from something relational in which the source, and perpetrator, is known, to a dispersed, undefined, and atmospheric condition (Radovac 2011; E. Thompson 2004). As such, noise pollution echoes and amplifies key environmental imaginaries of its time. This was an era of a new "planetary consciousness" marked by "the disappearance of the outside," the atmosphere no longer apart from human life but entangled with it.[2] Conceptualizations of networked holistic ecosystems proliferated in the form of ecologies of mind, nature, and technology (Bateson [1972] 2000). At the same time, *the environment* was defined in distinctly anthropocentric terms: "The natural world or physical surroundings in general either as a whole or within a particular geographic area, esp. as affected by human activity."[3] Noise pollution—generally described as the effects of the sounds of manmade machines on humans—echoes this anthropocentrism even as it undoes the stability of such partitioning, rendering instead a permeable body that is "intermeshed with the more-than-human world" (Alaimo 2010, 2). Though demarcated as specifically airborne sound, noise is not a form of air pollution. Instead, it is the pollution of the sonic environment by noise. Difficult, in this way, to pin down or point to as a concrete and stable thing, its atmospheric qualities and manifestation in experience render it both self-evident and generalized, even as they serve as grounds for its dismissal.

Aircraft noise was crucial in figuring noise as pollution.[4] More pervasive, more generalized, and more of an exteriorized threat than other kinds of noise, it amplifies an environmental imaginary that is fundamentally atmospheric. Though aircraft and airport noise are often glossed, specifying aircraft as the source of airport noise generalizes beyond the geographic space of an airport, shifting from particular political mobilizations. Aircraft noise served as an index for the noise crisis and for antinoise mobilizations. It was generally listed at or near the top of decibel scales, surpassed only by the sound of a rocket or space shuttle launch. R. Murray Schafer's 1970 *The Book of Noise*, like many publications of the time, ranks a jet plane highest on a decibel scale, at 130 dB, with threshold of hearing (0 dB) and rustling leaves (10 dB) at the bottom.[5] Articulating a widely shared sentiment, Schafer describes aircraft noise as the ultimate increase in technological sound; "not localized or contained," it turns the sky into a "big sound sewer."

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That "aircraft spreads noise everywhere" marks its pervasiveness, filling the skies—or airspace—with noise that, in its proliferation, seems to be dangerously beyond the control of people experiencing it on the ground (1970, 17, 16). Its increase in frequency and volume by that time fueled fears of its further intensification, the algorithmic logic of the decibel wielded in anticipation of sensory futures. Aircraft noise was at the center of early federal noise regulation, exemplified by a Noise Abatement Office housed under the FAA beginning in 1967.[6] At the same time, as a more general frame of the environment emerged, it began to lose its hold on noise writ large. In *The Politics of Airport Noise*, Gordon McKay Stevenson Jr. (1972) credits environmental legislation with successfully addressing airport noise by scaling up and making it a generalizable concern. Yet the noise of planes, inseparable from their safety, also remained apart; Edmund Muskie's proposal that the EPA have regulatory authority over the FAA was voted down (U.S. Senate 1974b, 120–24).[7] Half a century later, aircraft noise continues to stand on its own, a still unresolved legislative domain folded into yet distinct from environmental regulation.

TRACING INDETERMINACY

Noise pollution deobjectifies sound. Though there may be "sounds of" traffic or aircraft, there is no "sound of" noise pollution. Moreover, those "sounds of" that cohere as noise pollution emerge and come into being through sensation, which, following Deleuze, "is in the body, and not in the air" (2005, 32). Yet sensation falters, its seeming reality allowing noise pollution to take hold even as it remains unstable and indeterminate. The notion of noise pollution runs ahead of its content, a Lacanian signifier anticipating the meaning of the signified (Lacan 2006, 419). There is something that can be pointed to that is noise, and something that constitutes noise pollution. But that "thing"—which is hardly a thing—does not produce its own meaning as such. Lacking specific content or even amplitude, its substance emerges as a factor of measurement that opens a space of negotiation between experience and metrics (see chapter 2). Emerging along with a then-nascent environmentalism, it is figured as its own form of pollution that, though of air, is not air. The instability of the category and its falling away—into gaps of legislation, jurisdiction, experience, regulation, bureaucracy, environmentalism—suggests an immateriality of sound, or the *notion* that sound is immaterial. This is not, per se, an inherent or ontological property of either sound or its signification but a feature that is made in multiple ways.

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Of great concern in the 1960s and 1970s, the term *noise pollution* has subsequently declined in its use in print.[8] As with the environment, noise pollution is "a shifting subject which is the product of constant negotiation" (Goodie 2001, 80). Its decline is in part empirical, the result of the development of quieter technology and the implementation of noise management systems. Yet noise pollution continues to resonate in and through its effects. A flurry of legislation on municipal, regional, state, and federal levels around workplace safety, public health, and the environment from the late 1960s through the 1970s is sustained as regulations and their attendant bureaucracies. And while noise pollution remains of concern, it is by now thoroughly naturalized, pollution folded into an understanding of noise. Today when LAWA noise management staff are asked whether they use the term *noise pollution*, they immediately respond: "No! Noise is by definition pollution." Continuing, they explain that "Noise is unwanted sound." This might be followed by a description of the PR nature of their job, and how the management of language is necessary to not give fodder to the ongoing dissatisfaction of people living near the airport, whose complaints are required to be heard as part of the community relations mandate of noise management regulations but no longer affect flight paths or sonic volume. Complaints, which once motivated civic mobilization efforts, lawsuits, noise pollution legislation, and technological developments, are now in excess of a system that folded the subjective nature of noise into noise measurement systems (see chapter 2). Yet, as suggested by LAWA's iteration of noise pollution, there is also always an excess—a wider field that is excised, a quality of that which the metrics rationalize and a qualitative aspect to the metrics themselves.

Making Noise Pollution

It is a curious task to convey the emergence of a term, the ways in which something—an idea, a category, a sensation—that previously did not exist took hold. To capture how something as amorphous and indefinite as *noise pollution* came into being—came, that is, into awareness, audibility, and political attention. And to assess how a multiplicity of experiences and sounds was rendered singular, generating agreement. Tracing the emergence of *noise pollution* from 1964 to 1967 helps historicize a term that is by now fully naturalized. While we have access to references in print, the ways in which *noise pollution* captured a public imagination and circulated in speech are less accessible. Moving from an indoor environment to the outdoors, *noise*

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pollution was made possible by an emergent environmentalism, even as it stood at the forefront of environmental concerns. As Nicholas C. Yost, then deputy attorney general of California, told a congressional subcommittee in 1972, while "Two years ago 'noise pollution' was an unfamiliar term," it now prompted more complaints "than any other pollutant or threat to the environment" (U.S. Senate 1972, 165). Once established, noise pollution is cast back onto earlier noise controversies that were not conceived of in those terms at the time, lacking, as they did, the environmental framework that made noise pollution possible (Coates 2005; Rome 1996; Smilor 1977, 1980).[9]

In 1966 Republican senator Theodore R. Kupferman of New York gave himself credit for coining the term *noise pollution*. On April 21, he introduced a bill to establish an Office of Noise Control within the Office of the Surgeon General.[10] Beginning his remarks with general comments about environmental concerns, he proclaimed: "Another serious environmental problem which demands our immediate attention is that of excessive noise. I call it 'noise pollution.'"[11] Picking up on a discussion percolating among acoustical engineers and the building industry, Kupferman, who once argued, "It does not take Gertrude Stein to know that a contract is a contract is a contract," was said to have coined the "newest phrase" of "Noise Pollution" (New York State Unified Court System 2014; Delta Democrat-Times 1966). Nonetheless, though Kupferman's use of the term may have moved noise pollution outdoors, he was not the first to use the term. That honor goes to journalist Patricia McCormack, who two years prior seems to have brought the term *noise pollution* into the American public imaginary.[12]

In 1964 McCormack published two syndicated editorials insisting on the importance of quiet for health and well-being. Her rather differing sources attest to a widespread interest in the subject at the time. Readers of the *Logan Herald Journal* in Logan, Utah, were urged to "Take a 10-minute 'quiet break' once a day to overcome harmful effects of noise pollution on the homefront." Drawing on a presentation by Lee E. Farr to the Insulation Board Institute (IBI) symposium on the "deterioration of sound environment in homes," McCormack warned readers of the "psychosomatic illnesses" caused by too much household noise—especially that of one's neighbors (P. McCormack 1964a). Later that year, the *Lubbock Avalanche Journal* in Texas ran a piece on the importance of "quietude." Here her source was Barbara Chapin, a "consultant on peace literature for the American Friends Service Committee," who was inspired to think about "noise pollution" by a young boy "sitting beside her in a bus one day." Pointing out the open window of their "rickety bus," he told her he wanted to "hear all the no-

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sound nothing out there" of the trees they were passing. With the silence of trees echoing that of a Quaker meeting, quietude, Chapin maintained, was a means of developing an "authentic" self, a centered, grounded person able to function in the world (P. McCormack 1964b).

While Chapin is otherwise silent in the archives, Lee E. Farr's work circulated widely in editorials and congressional hearings on noise, most notably through an article he published based on his 1966 presentation. Titled "Medical Consequences of Environmental Home Noises," it addresses "Noise, or 'unwanted and intrusive sound,' as a pollutant of personal home environment" (1967, 171).[13] For Farr, crowded cities, apartment living, technology, and prosperity had coalesced to make the environment of the *home* a potential threat to the psychic, if not physical, health of its inhabitants. Farr, a pediatrician and chair of the Department of Environmental Health at the University of Texas School of Public Health, also worked as a consultant for the IBI (Hamilton Daily News Journal 1965). Farr's research up to then had focused on another atmospheric concern, that of the relationship between nuclear radiation and pediatric medicine. Later he turned his attention to the risks of smoking and applied his interest in industrial acoustics by submitting a patent for a new double-paned window. Farr's article on environmental home noises is anecdotal rather than research driven, bemoaning consumer culture, apartment living, and loud cocktail parties. There, listening enacts a certain sociability—a new form of professional obligation, a way of being together with neighbors, confirming and solidifying commonalities of class while amplifying differences in age. Though written in a detached, generalized way, Farr's description of the sensory experience of a cocktail party comes across as entirely personal. "When heterogenous background noise becomes significant, . . . the problem of discrimination and selection of conversational sound from an adjacent person speaking may require a major effort in an older person. The inability to clearly distinguish what is said then can result in a rejection of participation in such gatherings by this individual, despite the fact that invitations to such affairs within some circles are a measure of success" (1967, 173). The annoyance resulting thereof, experienced while in the throes of the party, disperses and spreads, the atmosphere of the event generalized as an atmospheric condition—a condition of the time, or of an "environment."

Farr anchors his perspective on noise in Samuel Rosen's study of the Mabaan, another widely circulating article that is frequently referred to in legislative hearings and publications on noise. The Mabaan make an appearance in R. Murray Schafer's *The Book of Noise*. In a section titled "Why the

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Africans Hear Better," he explains that Samuel Rosen "attributed the superior hearing ability of the Africans to their noise-free environment. The loudest sounds the Mabaan heard were the sound of their own voices singing and shouting at tribal dances" (Schafer 1970, 11–12). The Mabaan were an ethnographic fantasy rendered real through metrics and calculation, as well as through their displacement from an industrialized present. Not exposed to "the cacophony of modern civilization," they offered an opportunity for studying the relationship between noise and hearing loss. In Rosen and colleagues' "Presbycusis Study of a Relatively Noise-Free Population in the Sudan," they describe traveling by Jeep down a "narrow, rough dirt trail" that was "sometimes difficult to find and to follow" to arrive in a village "650 miles southeast of Kahartoum," where their trip had started, "a few miles from the Ethiopian border, and 10 degrees above the equator" (Rosen et al. 1962, 727). We learn little of how the Mabaan listened. Instead, Rosen and his research team listened to the pulse and rhythms of Mabaan bodies and activities, measuring their heart rates and testing their hearing. A projection of American norms and desires broadly construed, the study circulated in support of a range of concerns.

For Farr, less concerned with hearing loss, the Mabaan study provided evidence of the effect of noise on a person's "emotional status" (1967, 171). Rather than causing health effects in and of itself, noise proliferates into sensory-affective registers that in turn might cause psychic or physical effects, or that might disturb aspirations of domestic harmony, the home a sanctuary, at least for men.[14] Sounds within the home were newly audible (and gendered): the kitchen appliances, the shrieking kids, the nagging wife—all of which require control, dampening, and acoustic treatment to avoid angering a husband who was at the office all day and for whom, a former president of the Acoustical Society of America suggested, noise might cause "circulatory troubles, hearing loss, fatigue, emotional disturbances, nagging and wife-beating" (New York Times Service 1965). As visualized by *The Blue Marble*, the first image of Earth as seen from space, there is no longer an outside, an other, a horizon of difference; instead one's own home, indeed one's self, was now a threat. Apartments—with thin walls that allow the noise of others to seep in, reverberating materials of tile and glass and inhibiting conversation—had become the problem rather than the neighbors. And while noise had moved from nuisance to environment, the latter remained that of the acoustic space of the home.

From noise pollution's origins in the home, it began to move outdoors. The Acoustical Society of America's 1965 meeting focused on the subject of

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noise (Acoustical Society of America 1965). Although the term *pollution* is not used in the abstracts, *environment* appears numerous times. And though hundreds of papers were presented at the ASA meeting, and dozens specifically on noise and noise control, one on traffic noise was taken up by the press to cast noise as pollution. The *New York Times* covered the meeting under the heading "Noise Pollution." "Engineers Find U.S. Gets Louder," the headline proclaims. "The talk centered around 'the noisy environment,' in which the air is being increasingly polluted with more and louder cars, the shriek of jet planes, the clatter of construction and automated equipment and the harsh crackle of transistor radios" (New York Times Service 1965). A columnist in Tyrone, Pennsylvania, picked up on a paper presented by a Canadian acoustical engineer whose work focused on traffic noise; drawing noise together with other forms of pollution, Dick West opined, "We here [*sic*] a lot about air pollution and water pollution, and the measures being taken to control them. But sound pollution has been largely neglected" (West 1965). The Society for Science and the Public reprinted *Science News-Letter*'s report on the same talk with the title "Noise Pollutes Air." "The world around us is filled with noise, noise, noise. Unwanted and unnecessary sounds are a form of air pollution not receiving the attention their high nuisance value deserves" ("Noise Pollutes Air" 1965, 389). The brief article is in the corner of a page that features pieces on acoustic technologies for perceiving—for bringing into focus, or audition—that which is unseen and inaudible: "Ultrasound 'Sees' Tumors" and hydrophones that "Aid Underwater Hearing" (Ewing 1965, 389; "Aid Underwater Hearing" 1965). The "inaudibility" of noise resides in the "schizophrenic" attitude of people who want their cars to audibly index power yet would also "like to enjoy an evening out-of-doors in peace and quiet." To achieve an "integrated attack on . . . traffic noise," public attitudes must change ("Noise Pollutes Air" 1965, 389). The title proposing that "noise pollutes air" reflects some instability about what kind of pollution noise might be, which is only lightly or loosely stabilized in the following years, as noise pollution becomes a subject of federal legislation.

The year Kupferman is said to have coined the term *noise pollution*, its use burgeons, gaining stability in its diversity. By this time, the range of things that compose the "hybrid" of noise pollution include public health, annoyance, progress, jets, decibels, residential noise, deafness, anxiety, cities, technology, and progress. There is little criticism of it. Humor columnist Harold Coffin is unique in his skepticism. Though he suggests the newfound problem of noise pollution might be masking ulterior motives, he turns to-

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ward its potential as something he seems to have experienced himself (Coffin 1966).

> "Noise pollution" is the new hazard in our big cities. Seems the smog is getting so thick the residents can hear it.
>
> Among other offenders are noisy autos, jet airports and television commercials.
>
> They used to tell us it wasn't the heat but the humidity. Now it's not the smog—but the racket.
>
> City slickers sure can dream up a lot of excuses for moving to the suburbs.
>
> It's almost impossible to hear yourself think these days, but this could be a blessing when you consider some of the things there are to think about.

His critique is not that of noise pollution per se but of white flight and suburbanization, of a privileged politics that can take up something like noise pollution at a moment of more pressing concerns. And though noise pollution might obscure other issues, it also joins a cacophonous atmosphere of crisis and change. A journalist questioned Kupferman's timing in calling for legislation addressing noise pollution. It was an election year, and he suggested that there were enough causes already. "However, if it's something different you want, you might try the crusade against 'noise pollution' which is being spearheaded by Theodore R. Kupferman, a New York congressman" (Long Beach Press-Telegram 1966). There does not, however, seem to be a question about whether noise is in fact pollution. A news piece with the headline "Is Noise Pollution?" is in fact an argument for it as such; though, anticipating subsequent negotiation over its nature as pollution, the article suggests that a better term might be "auditory pollution," or the pollution of that which is heard (San Rafael Daily Independent Journal 1966).

Noise pollution persisted, and by the following year, it had arrived as a worldwide crisis grounded in an international geopolitics, as marked by the publication of an issue of the *UNESCO Courier* dedicated to the subject. Its nine editions—English (United Kingdom), French, Spanish, Russian, German, Arabic, English (United States), Japanese, and Italian—map the problem of noise, as articles address ways in which noise is being dampened, abated, curtailed, legislated, regulated, studied, and experienced in Switzerland, the USSR, the United States, Germany, France, and England. Images convey the negative experience of noise, whether the "noisiness" of a given situation or the auditory-emotional experience of hearing, or living

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with, such noise. Scooters turning a city corner reverberate in the narrow street of a medieval city, the volume of sound metamorphized as a "feeling of power" ("Noise Pollution" 1967, 7). A photo of the interior of an early anechoic chamber, with long soft tubes of stuffed fabric lining walls and ceiling, a man holding something, perhaps a sound pressure–level meter, is a warning against total silence. Images from a wind tunnel test of supersonic aircraft shows whirling white lines—their sound also unfathomable. Three children hold their ears while a commercial aircraft flies overhead, clouds lit by the sun from behind; one boy smiles broadly, another more slightly, the third following the photographer's direction to gaze toward the sky with a look of concern. This photo is staged and likely a composite. Argentina's "noisy" city is conveyed by a tangle of signs hanging in a street, visual "noise" substituting for the sonic. Dust flies in front of an apartment building demolition—"noise" ("Noise Pollution" 1967, 9, 12, 15, 21). Another photo, titled "A Piece of Noise," realizes noise as object. A little mountain scene, it is "what sound would look like if it were solid instead of vibrations in the air" ("Noise Pollution" 1967, 23), the black shadow it casts in the circle of light behind it evoking Wagner's Valhalla. Figured as an iceberg, noise is cast into a future of climate change, icebergs melting, noise falling away.

Becoming Atmospheric

Noise pollution enters U.S. federal legislation as Title IV of the Clean Air Act Amendments of 1970. Emergent environmental imaginaries took shape in and through air and noise, attunements toward an atmospheric that, in orienting away from the durability of soil and water, moved above and beyond the surface of the Earth. In constituting noise as specifically airborne, humanly audible sound, environmental legislation gave noise an atmospheric—and indeterminate—status. Newly figuring attunements to the sensory, the audible, and the aerial, noise pollution is conceived of as something in need of regulation, a problem to be controlled, a risk from which people should be relieved. Performing what Foucault calls "governmentality" and Latour describes as "inscription," senators and experts come together and talk, governmental agencies are formed, bills are scripted and circulated, regulations are developed and enacted as law, bureaucratic scaffolding configured for their enforcement. Citizen experts and experts in acoustics, law, municipal governance, and the environment share their expertise, trying to make something of noise. Noise pollution draws together

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a public and its representatives, amplifying a relationship between elected officials and their constituents in which the latter appeal to the former to do something, and the former make government a protectorate of the people—a people in need of protection and education. Noise pollution is a PR campaign to help the public understand what it risks from a newly imagined environment that is, because of their own actions, already against them.

Noise, which began 1970 categorized as a concern of health and quality of life that might best be addressed through the Surgeon General's office, ended the year as an environmental concern. 1970 was in many ways the year of the environment. Highlights include President Nixon signing the National Environmental Policy Act (NEPA) on January 1, passage of the Environmental Quality Improvement Act on April 3, and celebration of the first Earth Day on April 20. The Environmental Protection Agency opened its office on December 2, and on the last day of the year, Nixon signed the Clean Air Act Amendments of 1970, Title IV of which addresses noise pollution. Over the course of the year, a flurry of noise control legislation was introduced, backed by Democrat congressman William Fitts Ryan and Republican senator Mark O. Hatfield.

Between January 20 and March 26, Ryan introduced three versions of the Noise Control Act of 1970 to the Committee on Interstate and Foreign Commerce.[15] The bill proposed an Office of Noise Control in the Office of the Surgeon General, which would issue grants to governmental agencies "for noise control and for research into the causes, effects, control, and abatement of noise."[16] It would also provide funds for demonstration projects and establish the Noise Control Advisory Council in the Department of Health, Education, and Welfare to oversee the activities of the Office of Noise Control. This would move the existing Noise Abatement Office from the FAA, shifting the emphasis from the source of noise to its experience, and from a particular type of noise, that of aircraft, to noise as a general concern. Ryan included an article that had been published that week in the *Washington Evening Star* on the problems of noise, which makes a case for its significance, if not on the level of pollution, as a "menace to health and well-being" that "if it does not threaten the environment, lowers the quality of the environment." From this perspective, "Noise, unlike ugliness and blight, can be measured with great precision."[17] Hearings on the proposed Clean Air Amendments were held concurrently by the Senate Subcommittee on Environmental Pollution (then the Subcommittee on Air and Water Pollution), a subcommittee of the Committee on Public Works chaired by Senator Edmund S. Muskie (U.S. Senate 1974a, iii).

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By November 24, the noise control bill had moved to the Senate, where Mark O. Hatfield introduced the Noise Abatement Act of 1970: "A bill to promote public health and welfare by expanding, improving and better coordinating the noise abatement and control services of the Federal Government; to the Committee on Government Operations."[18] The EPA had recently been formed, and noise was now squarely pollution, in the domain of the environment rather than public health.[19] Hatfield had recently given a talk at the organizational meeting of the Noise Abatement Council of America titled "Noise, the Gathering Crisis," touching on topics that spanned urbanism, health effects, metrics, law, and labor (U.S. Senate 1974b, 127–32).[20] Insisting that pollution was *the* pressing concern of the twentieth century, Hatfield argued that noise "is reaching crisis proportions in the United States," its cumulative effects conveyed by what Leo Beranek called "'acoustic fatigue'" (U.S. Senate 1974b, 127–28). When Nixon signed the Clean Air Amendments of 1970 on December 31, it included the Noise Pollution and Abatement Act of 1970 as Title IV.

All discussion of why noise pollution was included in the Clean Air Act Amendments of 1970 is absent from the record. A note in the bill's legislative history states only, "Materials dealing with noise pollution have generally been excluded from this document. (Separate legislation dealing specifically with noise pollution has since been enacted, Public Law 92-574)" (U.S. Senate 1974a, vii).[21] Yet traces remain, providing hints about the inclusion of noise pollution in an act addressing air quality. It states: "The growing public awareness over the quality of the environment has spotlighted another form of pollution. Noise may prove to be the most difficult of all pollutants to control. Evidence regarding the effects of noise has been accumulating at a rapid pace, and Federal action has become appropriate" (U.S. Senate 1974a, 445). That noise is "pervasive . . . [and] omnipresent in our technological society in urban areas" (U.S. Senate 1974a, 446) indicated a need for regulation. Accordingly, bureaucratic concerns are addressed—the office to be formed (at this point named the Office of Noise Pollution Control and Abatement), its oversight (the secretary of health, education, and welfare, to be moved to the Environmental Protection Agency), and its work ("comprehensive study of noise, including its causes and effects, and to make recommendations to the Congress for appropriate legislation"; U.S. Senate 1974a, 446). The Noise Control Act of 1972 initiated the formation of the Office of Noise Abatement and Control (ONAC) under the EPA, with an immediate mandate of research. That ONAC did not include the word *pollution* in its name reflects a shift toward a more generalized notion that "all noise

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is pollution," a formulation only possible after noise had already become pollution.

Of Air, Not Air

The inclusion of noise pollution in the Clean Air Amendments suggests it is a dimension of air—air figured as a holder, carrier, or container of other things, air that might be either polluted or clean. Vibration is occluded conceptually, as the propagation of sound in and through materials other than air is excluded in practice (see chapter 5). Yet distinguishing the two as exclusive is a curious operation that is in itself productive. As Steve Goodman suggests, "By zooming into vibration, the boundaries of the auditory are problematized" (Goodman 2010, xvi). Hence *airborne* is produced as a singularity that is not coterminous with general acoustics: air becomes agent, carrying sound, as it were, rather than enmeshed with sound as a vibrating conductive medium. Air figured as such was crucial in shaping modern environmental imaginaries. Not only did air pollution drive environmental policy, air articulated a unique conceptualization of the environment (Dewey 2000). The dispersed nature of air made it impossible to contain, its pollution at once specified as "aerial contamination" and generalized as an "atmospheric condition" (Dewey 2000, 37, 40). While smoke had long been a problem in industrial cities from London to Pittsburgh, Los Angeles was the birthplace of a form of air pollution consisting of myriad, inseparable sources—of, that is, smog, a mysterious mixture whose components only became known after a decade of oil company–funded research by the Stanford Research Institute, which intentionally obfuscated both source and solution (and where psychoacoustician Karl Kryter later worked; Jacobs and Kelly 2008; also see chapter 2).

Taking at face value the title page of the Clean Air Act Amendments of 1970, it appears that noise is a pollutant of air. The list of air pollutants in the amendments runs from *A* to *X*. "Acetaldehyde, Acetamide, Acetonitrile, Acetophenone." I scroll down to the *N*s. "Naphthalene, Nitrobenzene, 4-Nitrobipheny, 4-Nitrophenol, 2-Nitropropane, N-Nitroso-N-methylurea, N-Nitrosodimethylamine, N-Nitrosomorpholine" (U.S. Environmental Protection Agency 2017). No "noise." Noise, it turns out, is not a pollutant of air. *If*, however, noise were an air pollutant, as its inclusion in the Clean Air Act Amendments of 1970 suggests, it might instantiate air, "materializing" something immaterial yet ever present, even in an immaterial form. Noise could be what Irigaray calls air's "entry into presence," its manifestation

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(1999, 9, 14); however, noise is absent from air, and only wind and smoke bring air into human awareness through sensation. This is a different air than that of the Clean Air Act Amendments. Irigaray's air is absence; withdrawing from perception, it is "impalpable, imperceptible, invisible, insensible, unintelligible . . . while remaining the condition of possibility, the resource, the groundless ground" (1999, 5). Conversely, the Clean Air Act Amendments bring air into being as a kind of chemico-material mush, full of stuff that cannot be seen but can definitely be breathed, and that might be disarticulated through testing. Noise, however, is not rendered substance in the same way as the chemical but is cast in its own domain, a sonic environment whose amplitude might change, its aerial status implicit.

At the same time, Irigaray's discussion of air's instantiation points to something of what is at stake in the Clean Air Act Amendments, and in the relation between noise and air as figured in their categorization around pollution. While wind and smoke are air's "entry into presence" (Irigaray 1999, 9, 14), air is singular as a *medium* for light and sound: "No other element carries with it—or lets itself be passed through by—light and shadow, voice or silence" (1999, 8). Thus for Irigaray wind/smoke and light/sound differ in their relationship to air, the former a manifestation of air, the latter a substance differentiated from air.[22] This distinction is crucial for the status of noise pollution in the Clean Air Act. Smoke, an early way of understanding air pollution, is a substance that imbues air; inseparable from it, smoke pollutes air—it is a pollutant. Sound, however, is conceived of as independent, carried along by or moving through air without becoming or manifesting air, a conceptualization that is sustained as *noise pollution* is formulated in congressional hearings, EPA documents, and publications.[23]

Noise, ultimately, is what Theodore Berland in 1970 called "the third pollution"; its own form of pollution, it is considered comparable to yet distinct from air and water pollution. Perhaps most obviously, noise pollution differs from air and water pollution in its very formulation, with noise itself the pollutant. For the EPA, the differences between forms of pollution lay in the nature of an unpolluted atmosphere and the capacity for measurement. In 1972 noise pollution hearings, an EPA official explained,

> There are some fundamental differences between "air pollution" and "noise pollution." These are, in the main, the following: (a) We know the chemical constituents of a "normal" atmosphere, and (b) our sensing devices (because they respond to separate contaminants) can tell us how much of each given contaminant there is in the atmosphere at

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> a given point, as a function of time. . . . In noise pollution, however, (a) there is no such thing as a well-defined "normal atmosphere," and (b) the inputs from various sources cannot be separated by our sensing devices—the microphones—since there is only one "contaminant," the pressure waves. And not all pressure waves are even noise: some may be music or other desirable sounds. (U.S. Senate 1972, 357–58)

A sense of confusion percolates in the addled prose. Proliferating into contingencies, its author seems to be thinking through what noise pollution might be rather than making a definitive statement. Noise pollution begins to take shape in its difference from air pollution. It is defined principally through lack: a "normal atmosphere," differentiated contaminants, and social agreement about its value.[24] Each negative is indeterminate, without ground, a shifting atmosphere held steady only by the microphone. Noise pollution evinces a kind of weird realism of escaping forms of matter, of matterings that are in the air. Atmospheres proliferate across air and sound. The "acoustical environment," measurable as "ambient" sound levels, is what noise destroys or corrupts. It is, everyone seems to agree, vague, indeterminate, difficult to define, and even more difficult to measure—shifting sands on which noise pollution lies. The EPA recommends avoiding the term *ambient noise* entirely: "The problem of criteria for noise is complicated, and the effects are not as readily perceived as for air and water pollution. A criterion describing a 'cause and effect' relationship. Ambient levels of noise, unlike air, change and dissipate rapidly. The problem of 'ambient' noise is when and where?" (U.S. Senate 1972, 541). At the same time, the general formulation of sound as "pressure waves" and its measurement by the microphone as "sensing device" betrays a slippage across registers of perception, conveying how the specificity of noise pollution is crafted out of its potential meanings, and how something that is not air is nevertheless of air.

"Not air," noise pollution falls away as a legal category. In 1981 Reagan closed ONAC; the act remains but without an enforcing agency, a source of some anxiety to this day.[25] As of 1990, titles of the Clean Air Act Amendments are:

I	Air Pollution Prevention and Control
II	Emissions Standards for Moving Sources
III	General
IV	Noise Pollution
IV-A	Acid Deposition Control

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V Permits
VI Stratospheric Ozone Protection

The list is Borgesian, evocative of the nonsensical categories (or modernist-rational categories of nonsensical things) of the Museum of Jurassic Technology. Following Foucault, Borges's "Chinese Encyclopaedia" breaks "up all the ordered surfaces and all the planes with which we are accustomed to tame the wild profusion of existing things" ([1970] 1994, xv). The order of material structured by the section titles of the Clean Air Act Amendments does not need to be rational—these are legislative acts addressing issues related to clean air as they arise. As the titles tell us, sometimes the issue is the pollutant (moving vehicle emissions), sometimes a part of the atmosphere that is threatened (ozone), sometimes a climatological effect of pollutants (acid rain), sometimes regulatory processes (permits) or just "general" issues. This arational list also does not provide many clues about the meaning or nature of noise pollution, other than its status as a category that was of concern at a particular moment. As an index of process, the act itself takes on structural curiosities. In 1990, Title IV-A: Acid Deposition Control was added to the Clean Air Act, without repealing existing Title IV.[26] There are now two section IVs.

Noise as Environmental

Meeting the mandate of Title IV of the Clean Air Act Amendments, in the latter half of 1971, public hearings were held across the country on sources and aspects of noise: construction noise; manufacturing and transportation noise; urban planning, architectural design, and noise in the home; standards and measurement methods; legislation and enforcement problems; transportation noise (rail and other); urban noise problems and social behavior; physiological and psychological effects; agricultural and recreational use noise; technology and economics of noise control; national programs and their relations with state and local programs (U.S. EPA Office of Noise Abatement and Control 1971a–h). An investigation into the scope of the problem of noise, the hearings ultimately led to the formation of ONAC in 1972 through the Noise Control Act. Coordinated by the EPA, the hearings mark a moment in which diverse and divergent issues and interests related to noise come under the umbrella of the environment. With a range of subjects, interests, engagements, and modes of attention, the hearings were spaces of attunement, where people came together to form something

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that is inherently formless. Noise pollution comes into being as something identifiable if indeterminate through encounters and exchanges, prepared speeches opening into questions. The hearings reorient ways of being in the world as some share their experiences, others their analyses, and still others their expertise or their ability to control the indeterminate. These are *public* hearings, and a speaker thanks the EPA for listening to them, and for listening to (acknowledging, taking seriously, doing something about) noise (U.S. EPA Office of Noise Abatement and Control 1971c, 24). People, interests, research, and experience coalesce. Distinguishing between sources and spaces of noise, the hearings draw together those who have made noise and its control a concern with others engineering modes of transportation and those hearing its noise. Speakers include acoustical engineers, urban planners, public health officials, lawyers, and medical doctors.

In July, the director of ONAC chaired a panel with an acoustical engineer from Bolt, Beranek and Newman (BBN); a professor from Clemson University; the director of Citizens for a Quieter City; a representative of the Governor's Council of the State of Virginia; and an environmental engineer from the School of Public Health at the University of North Carolina.[27] Addressing the subject of noise in construction, they heard from representatives of building material companies, contractors and machinery manufacturers, police, architects, the FAA, and citizen groups from Atlanta to Illinois. Someone spoke from United States Gypsum, a company that was also a member of the National Noise Abatement Council, a lobbying and PR organization principally comprising companies manufacturing building materials for acoustic treatment.[28] The Sierra Club sent a representative, as did the airport noise lobbying group N.O.I.S.E., formed by residents around La Guardia and Los Angeles International Airport. John Glenn represented Citizens for Clean Air. And there were citizens, members of the public speaking about their own experience, speaking for themselves and not on behalf of an organization, complaining of truck noise on recently built freeways and arguing for zero population growth.

Though the hearings were listening sessions, they were not open to comments from a general public. Instead, citizen experts—people bothered by noise who had learned an immense amount about its production, measurement, and control—were there as laypeople. A few of these, some of whom testified and served on the moderating panel asking questions of those testifying, founded civic groups on either the local or national level and authored books about noise directed toward the general public, educating

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readers of the threat of noise and urging them to lobby their elected representatives to do something about the burgeoning din.[29] In Dallas, a woman read a poem about trees. She argued for their use as acoustic treatment, only to be told that the study she referred to had been debunked; trees do not in fact lessen decibel levels, though their appearance makes people perceive a decrease in noise.

San Francisco hearings, ostensibly addressing the topic of standards and control, end up focusing on the specific and pressing noise concerns of Californians. Airports and freeways loom large as areas of concern. Los Angeles city councilperson Pat Russell, whose district included the airport and communities to its north and northwest, suggests that the definition of blight be expanded to include the effects of airport noise on homes. "In my district, we have really beautiful homes which are blighted in every way except physically." Shifting a definition of blight would, she claims, allow homeowners to take advantage of zoning changes rather than selling to the airport for a potentially devalued amount. A citizen group whose members include aerospace engineers lurks behind her proposal, an "organization . . . signing up almost every house within a group of about 800 houses to take part" in a project of changing "single-family residences into multiple use and into a commercial use." They are stymied in their project, however, by their inability to condemn property and by their lack of authority to enact eminent domain (U.S. EPA Office of Noise Abatement and Control 1971d, 69–73).

Noise as an environmental concern sharpens during these hearings. Randall Hurlburt, environmental standards supervisor for the City of Inglewood, and a regular speaker at federal noise hearings, is also there. He reports on their noise ordinance and on levels, precedents for other airport-adjacent areas. He lobbies the EPA to adopt policy related to community noise levels and noise standards for airports and other forms of transportation (U.S. EPA Office of Noise Abatement and Control 1971d, 369). As his testimony attests, airport noise had become pollution. "Although located near the Los Angeles International Airport, noise was not considered to be a severe problem until the advent of the jet aircraft in 1959. With its high-pitched scream during approach to landing and with the great increase in number of flights that has taken place during the last ten years, the jet airplane has made Inglewood today an extremely noise-polluted city" (U.S. EPA Office of Noise Abatement and Control 1971d, 366). Ellen Stern Harris of Beverly Hills, an environmental activist instrumental in the creation of the California Coastal Commission, repeats testimony presented at hear-

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ings in Los Angeles the previous year (Oliver 2006). She focuses on airport noise, a problem for Beverly Hills. Admitting her own sensitivity, Harris explains that she has very acute hearing. She calls out the ineffectiveness of LAX's Noise Abatement Commission—people were not calling its hotline anymore, they were calling her. But she rejects an offshore airport as a solution, contending that a different population would simply be exposed.[30] Moreover, the dredging required for the project would likely pose a similar risk as that of nuclear plants at sea—another threat to human health and the health of the Earth's resources that was atmospheric in both its physicality and its uncertainty.

THE MATTER OF NOISE POLLUTION

Noise had arrived. There was agreement that it was a problem and that it was pollution. Yet in these processes of fixing noise—as pollution, as a problem, as able to be regulated, as a subject of federal concern—something seeps out. In discussion of what, precisely, noise pollution is, it wavers. Acknowledged as emergent, it was also already a growing problem; a form of pollution, it was unlike other defined forms, its newness as a term related to its sonic quality. Senator John Tunney from Riverside, California, opens his 1972 hearings on noise pollution by describing it as a pressing problem that was growing louder every year. An effect of urbanization and of technological progress, noise was affecting as many as 80 million people. With most noise legislation related specifically to aircraft noise and sonic boom, he proclaims the need for comprehensive research and control of ambient noise (U.S. Senate 1972, 95).[31] *Noise pollution* designates something already "worsening" even as it opens a space for complaints—for a new mode of attunement toward an amplified atmosphere entangled with a listening self. All of this is channeled into noise as a legislative concern, a machine generating regulation, bureaucracy, and concepts.

At the noise pollution hearings, there are no dissenters among those testifying. Everyone is there to address noise as an environmental problem, to solidify noise as pollution, to treat noise pollution as a public health concern, and to regulate it through legislation. All are in agreement that noise is negative, a stance confirmed by its designation as pollution. Even its "subjective" nature does not lessen the overall problem of noise: of noise in general, of noise generalized, of noise as pollution. The doctor who loves the unmuffled roar of his motorcycle also argues that noise in general is bad. This is noise as "matter out of place," a contemporaneous notion of pollu-

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tion that, in a generalizing logic of structuralism, continues to hold as a definition of noise (Douglas [1966] 2002; Serres 2010). And yet, while noise is assumed to be bad, or unwanted, how much, why, and how to systematize are points of discussion and debate. "Noise is hard to measure," one speaker says. There is a need for standards, though such standards have to be practical to apply. Police, for instance, were unused to working with standards, and one-hundred-foot distances for measurement of traffic sound were untenable in urban areas (U.S. Senate 1972, 101). And then, which metric? "The decibel scale used for measuring and evaluating sound is just as important as the procedures," but "in the area of noise we are confronted with conflicting schools of measurement" (U.S. Senate 1972, 102). Should ambient levels be the basis, or "single spiked noise events"? (102). Defining noise as pollution (or as any given thing) fixes noise, even if as a "relative" notion. Yet when treated ethnographically, noise comes into being in its definition.

Materiality surfaces in the regulation of noise pollution, physical qualities serving as defining principals. "Noise is not subject to easy regulation. Unlike the common air and water pollutants, noise does not accumulate in the environment. Noise is not subject to collective treatment and reduction processes" (U.S. Senate 1974b, 89). Noise's ephemerality casts it as pure negative, a negative that must, however, be given substance. As Dr. Belt, motorcycle aficionado and frequent speaker at legislative hearings related to noise, notes: "In dealing with the problem of environmental noise, we must make some very basic assumptions about what constitutes a healthy environment. The absence of observable effects of environmental noise does not constitute scientific proof of a safe environment as some would have us believe. The absence of proof proves nothing" (U.S. Senate 1972, 160).

The EPA presents a chart comparing air and noise pollution as a means of stressing why standards for air quality measurement do not apply to noise (table 3.1). The agency is the most expert witness in the room, in the position of smoothing over discrepancies and addressing misunderstandings. It stands above the fray, drawing together and synthesizing (or excising) the perspectives of engineers, politicians, medical professionals, and more. Air pollution had by then known and measurable substance and effects. "Made up of potential chemical substances that are both cumulative and residual, and subject to meteorological dispersion/diffusion laws," it could be measured in the environment and by its effects on humans; a high incidence of respiratory effects was evidence of air pollution as a public health concern. Yet, along with the difficulty of measuring ambient noise levels, the only verifiable effect of noise on the human body was hearing loss. Its

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TABLE 3.1 Comparison of Noise Pollution with Air Pollution Regarding the Feasibility of Using "Ambient" Standards for Controlling Noise

Differences between Air and Noise Pollution, Which Lead to the Infeasibility of Using the Promulgation of National Ambient Standards as a Valid Federal Procedure for Controlling Noise

	Air pollution	Noise pollution
Characteristics	Made up of potential toxic chemical substances that are both cumulative and residual, and subject to meteorological dispersion/diffusion laws.	Physical energy characterized by sound pressure level and pitch (varied frequency). These sound energies are additive, decay with distances as a function of the inverse square law, and leave no residual after source termination.
Measurement in the environment	Measurement of time-concentration dose are [*sic*] easily accomplished with present equipment technology, since air pollutants do not vary rapidly with time or at short distances between monitoring stations.	Ambient measurements are extremely difficult, since noise is subject to rapid "on-off" source relationships and can vary appreciably at short distances from monitoring stations and in time at the same point.
Measurement of the human body	Presence of the polluting toxicant in the body is directly related to easily measurable ambient concentrations, and can be readily identified through physiological changes (e.g. large incidences of population respiratory attacks during high ambient chemical concentrations).	Other than for hearing impairment, there are no readily identifiable permanent physiological changes that can be solely related to noise exposure. Annoyance, on the other hand, can not be correlated with ambient noise levels alone, since it depends on time, frequency, and intensity relationships at the receiver along with socioeconomic factors.
Geographical control	Air quality regions were established to control ambient air pollutants traveling great distances and crossing geographical and political boundaries.	Noise travels only short distances from its source (i.e. sound energy decays as the inverse square of the distance from the source). Therefore, it can be controlled at or near the source and in most cases within existing political and geographical entities.

Source: U.S. Senate 1972, 356.

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other effect, annoyance, depended on factors in excess of ambient noise levels—time, frequency, and intensity, along with, some suggest, socioeconomic factors, thus making annoyance too individualized to scale to the level of public health (see chapter 2).

At stake is the specific physicality of noise, described as "physical energy" that "decay[s] with distances" and "leave[s] no residual" (U.S. Senate 1972, 356). Noise pollution is mathematical, while air pollution is chemical, substantive. Because noise only travels a short distance, unlike air pollution, which crosses geographic and political boundaries, it is best controlled at the source under the authority of existing political entities. Air pollution, conversely, drew new geographies, and air quality regions had been organized to address it—governmental agencies like California's South Coast Air Quality Management Agency, whose job was to work with and across existing city and county offices to regulate and control air quality. Such comparison is not, it turns out, an argument against the legitimacy or existence of noise pollution. It is simply the precursor to a discussion of the specificity of noise as a factor of sound energy and human perception, such that "To affect the human environment perceptibly, reductions of 5 dB or more are required (or major reductions of exposure time)" (U.S. Senate 1972, 362).

Noise pollution is ultimately construed as a relationship between perception and measurable levels of environmental noise, a dynamic entanglement of sensory immediacy and externalized techniques of inscription. The EPA leans on the logic of the decibel, explaining that "The human ear . . . responds logarithmically"—facts that are relational, that draw out discrepancies between human hearing and sound measurement as coextensive dimensions of noise control. Thus, "the amount of decrease in sound *level* will be of subjective importance to human observers rather than the corresponding amount of decrease in sound energy." This logarithmic entanglement of perception and sound pressure is sustained in the EPA's "Operational Conclusions":

> (a) When a noise environment is caused by several sources operating at once, (1) If the sources are at all approximately the same level, it does no good to abate one unless you abate them all. (This differs from the case of air pollution, where removing one of three equal sources would remove one-third of the contaminants.) (2) If one source is clearly dominant (6 to 10 dBA higher than the others), no perceptible reduction of the environmental level will result unless the dominant source is abated first. (U.S. Senate 1972, 362)

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Noise, both in its perception and environmental measurement, is a factor of complex mathematical operations. It is relation rather than substance, an immaterial force for which vagaries of human perception rather than definable quantity provide the bases for measurement. This is at play in the statement, "It is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare" (U.S. Senate 1972, 62). Noise pollution is thus a dynamic relationship between an environment "out there" and human health.

Atmospheric Bodies

Noise pollution composes the atmospheric even as it is itself atmospheric—invisible yet pervasive, persisting not in the air but in bodies, always and inherently subjective. Formulating noise as pollution casts the atmospheric as an entanglement of air and body. Across this continuum are both physiological effects of noise and "noise effects." A notion of a permeable body at the center of twentieth-century environmental imaginaries is captured doubly in noise pollution. The body subject to noise is described as "immersed in a sea of noises" (U.S. Senate 1974b, 556).[32] That immersion might be a problem relies on a permeable body, at threat from noise surrounding, and imbuing, it. At the same time, noise pollution helps stabilize the very notion of a body as permeable. As Linda Nash elaborates, "The notion of the body that has underwritten environmental activism since the 1960s . . . juxtaposes an awareness of the body's permeability and susceptibility to environmental change with the modernist desire for bodily purity" (2007, 212). In Los Angeles this proliferates across homes and neighborhoods, the permeability of the skin extending to the walls of the house through which aircraft noise might be heard, and the boundaries of a neighborhood newly porous to people no longer restricted by covenant or school segregation (see chapters 5 and 6).

In *Silent Spring*, a book credited with launching the 1960s environmental movement, Rachel Carson describes a body whose entire surface is now at risk.[33] Humans (and other species) do not simply inhale pesticides with their respiratory organs; rather, pesticides can be absorbed in and through the skin, permeating bone, blood, tissue, sinew, and organs. The body's largest organ, considered protection from that which is not-body, is newly figured as something that exposes a person to toxins or pollutants, invisible and potentially ever present in the atmosphere. "Dieldrin," Carson writes, "is about

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5 times as toxic as DDT when swallowed but 40 times as toxic when absorbed through the skin in solution." Like radiation, chemicals cast "a shadow that is no less ominous because it is formless and obscure." The skin—and nose and ear—are not so much in air as of air. This body-air entanglement means that forces or chemicals in air are equally in bodies, within which there is "an ecology of the world" (Carson 2002, 25, 188, 189). In Carson's posthumously published children's book *The Sense of Wonder*, she draws out the permeability of a sensing body as she describes the scent of low tide, "seaweeds and fishes and creatures of bizarre shape and habit, of tides rising and falling on their appointed schedule, or exposed mud flats and salt rime drying on the rocks" that is "drawn into one's nostrils" or the whippoorwill's "monotonous night chant, rhythmic and insistent, sound that is felt almost more than heard" (Carson and Pratt 1956, 66, 69). Following Timothy Choy, "Thinking about the materiality of air and the densities of our many human entanglements in airy matters also means attending to the solidifying and melting edges between people, regions, and events" (2012, 128).

Noise pollution amplifies an atmospheric imaginary in which human bodies are porous, "melting edges" casting a division between flesh and air (or "sonic environment"). And while noise, like air pollutants and nuclear radiation, is invisible and pervasive, it is understood as uniquely impermanent, both as a quality of sound and as a social designation. During EPA hearings, noise was described as an "invisible, weightless, non-toxic pollutant" (U.S. EPA Office of Noise Abatement and Control 1971d, 86). "A Silent Pollution Affecting Us All," as an editorial headline proclaims, is perhaps a metaphor gone awry, an unruly extension of the senses continued in the piece itself: "There is a form of environmental pollution which is invisible. It is tasteless and odorless" (Eureka Times Standard 1972). Thus noise pollution does not offer itself as the floating cloud encountered in Don DeLillo's *White Noise* (1985), a visible threat everyone tries to escape by car as it might, if inhaled, cause illness. Noise is more insidious, albeit like pesticides, variable, unquantifiable, and unknown, with potentially unfelt effects that nevertheless persist or accumulate.[34] As such, it resonates with other invisible threats of its time. This was the era in which cigarettes became known as hazards to one's health, and letters from readers warning of the risks of smoking followed articles about the threat of noise (Rosen 1974). More recently the detrimental entanglement of bodies and atmosphere has been characterized as the chemosphere, amplifying the problem of "exposure" (Mitman, Murphy, and Sellers 2004; Shapiro 2015).

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Noise differs from other forms of pollution in which the modifier is that which is polluted. Suturing such discrepancies, a notion of persistence based in an additive logic affords commensurability across divergent forms of pollution. This logic grounds an urgency about the problem of noise even as it defers the crisis to the future. Variations on acoustical physicist and antinoise campaigner Vern Knudsen's statement circulated widely: "If the noise we make keeps increasing at the present rate, it will be as deadly in thirty years in some of our downtown cities as were the Chinese tortures for executing condemned prisoners" (U.S. Senate 1974b, 133).[35] Elsewhere, in an alarmist tongue-in-cheek statement, he extrapolated that, at current rates of increase, noise levels would reach 225 db in 2029, far exceeding 160 db, which "will burn the hair off your head and chest or raise the temperature of your body to a lethal level," or "the 193-db barrier when you have complete modulation of the environment" (Knudsen 1955, 11). At the same time, noise is differently additive in bodies than other pollutants. As James Tunney stated at hearings on noise pollution that he chaired,

> Although noise . . . does not last in the environment for a long period of time, there is no question that the person who is the recipient of that noise, if it is excessive, and a danger to public health, can have lasting results, and can be permanently affected, and as a result of the noise he has received. So you are in a sense dealing with a similar problem to air and water pollution, and in that sense, the impact on the individual can be permanent. (U.S. Senate 1972, 441–42)

Crucially, it is not noise, or sound, that builds up in a body (which would parallel chemicals, and which is usually challenged); instead, it is the effects of noise, and, if this is annoyance, the effects of annoyance. These have consequences for things that do build up in the body: muscle tension or blood pressure (with pressure a somewhat different notion of "building up"). And though epidemiological studies of the health effects of noise tend to be serially dismissed, generally on the basis of poor correlation, there remains agreement that noise is "annoying."

With noise cast as pollution having entered the lexicon and legislation, another lawyer revisited *U.S. v. Causby* to argue for the legal grounds of noise itself on the basis of a metrics of annoyance. Joseph J. Alekshun Jr. writes, "the law's reverence for the tangible and concrete has made it insensitive to the growth of such invisible agents of disruption as noise. Early judgments of nuisance value remain in authority for today's noisemak-

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ers." Maintaining that the property line in the air is "elastic," he shifts the grounds of that line from jurisdiction to annoyance, from governmentality to perception. Drawing on (by then developed) metrics for noise measurement, Alekshun explains how this can be standardized: "The level of aircraft noise and the number of flights are both factors in the production of annoyance. In principle then, a consistent application of the *Causby* rule makes the property line elastic and jointly subject to the two factors" (Alekshun 1969, 741). Annoyance thus serves as a means of registering "noise itself" rather than extra-noise effects, casting the atmospheric as an air-body continuum in which sound is immanent in its medium, its perception significant as a register of sonic presence, a materialization of its immateriality. *Annoyance*, and more generally *the subjective*, continues to ground noise pollution as a category as it is taken up in legislation, regulation, and management. Though on the one hand this serves to make noise pollution a fundamentally unstable category, resting, as it does, on perception and thus unreproducible in its immanent immediacy, when fixed in metrics, *annoyance* is not challenged as grounds (chapter 2). Drawing noise as nuisance into noise as pollution, annoyance becomes a register of "the environment," establishing the latter's anthropocentric basis while casting human affect as entangled with external phenomena—in this case audible airborne sound whose simultaneous intangibility and pervasiveness make it most threatening.

Sounds of bird song, or the "quietest" place on Earth, are increasingly indices of climate change, marking disappearing habitats, species loss, and fantasies of a nonanthropogenic world (Krause 2015; Schafer 1994).[36] Noise's atmospheric qualities are equally significant to understanding how sound registers environmental thought in an era of climate change. As that which mars nature recordings, the wind noise in the microphone, and the driving concern for R. Murray Schafer's soundscape project, noise is also productive in and of itself, crafting the atmospheric conceptually and physically. The pervasive and systemic nature of noise pollution prefigures an atmospheric conceptualization that affords a generalized concept of *climate*. As a sensory experience, noise prepares us for the unwanted, undesirable, and unpleasant sensations of climate change—an atmosphere becoming too hot for human habitation, in which the comforts of contemporary life are potentially lost, smog hanging in air increasingly difficult to breathe. Moreover, like noise, climate change is inherently uncertain and indefinite. Yet the spatiotemporal scale of noise limits its perdurance as a concern both in itself and for environmental imaginaries. This has consequences not only for the

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parameters of "noise" that count as noise pollution but for the import of the category and its relation to environmental thought. If noise pollution had been based on something like "whistlers" (Kahn 2013), its status as an invisible, and generally inaudible, threat might have taken on a hemispheric scale. Instead, noise pollution falls away: there is no place for it in a totalizing rubric of climate change.

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