

Breathless in Beijing: Aerial Attunements and China's New Respiratory Publics

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Abstract

For all of its protean and ephemeral qualities, air exerts a remarkably muscular influence on urban form and contemporary life in China. In recent years, as the breakneck speed of China's development has altered the very chemistry of the atmosphere, the boundaries between breathing subjects and their toxic environments have become increasingly blurred. In this climate, Beijing inhabitants have sought out various modes of respiratory refuge, reorganizing the city into new spaces of atmospheric fortification. As deadly air divides Beijing into a series of protected insides and precarious outsides, life is increasingly being reoriented toward the dangers and imperatives of breathing in the Chinese city. Yet alongside the growing stratification of breathing experiences in the capital, shared exposure is also reconfiguring public life and landscapes through new solidarities and entwined fates. Engaging Beijing's emergent respiratory publics online, behind face masks, and inside conditioned air spaces, I explore how collective exposure is galvanizing new modes of atmospheric recognition in China. Specifically, I suggest that respiratory publics make invisible threats visible by mobilizing everyday objects, practices, and social life to render air both an object of concern and a site of intervention. Ultimately, by attending to how attunements to air pollution emerge through everyday practices and quotidian habits, this article expands upon a growing body of STS scholarship investigating how social life is increasingly constituted in and through atmospheric entanglements.

Keywords

air pollution; publics; China

Introduction

In December of 2015, under a billowing canopy of smog, a bride stopped at a busy intersection in Beijing to pose for photographs. She wore a fitted corset and periodically pushed a lacy veil out of her face as she chatted with curious passers-by. The gleaming white of her silhouette appeared as a beacon in the grey soup of industrial haze that blanketed the city that morning. While the

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sight of couples staging wedding photos in public areas around the capital was routine, this bride turned heads and slowed traffic as drivers and pedestrians lingered to get a better look. Kong Ning, a Beijing-based artist, had taken to the streets that day in a ten-meter long wedding dress made up of 999 3M-brand air masks (Figure 1). As part of a performative piece entitled “Marry the Blue Sky,” she dragged the train of white masks through the city in a surreal wedding march, imploring those she encountered to take public transport.

The invocation of marriage here is particularly poignant. Dramatically enacting Donna Haraway’s call to “make kin” outside the normative bounds of ancestry and species (2016), Kong’s union with the sky underscores the complex human and non-human entanglements that make up China’s air pollution crisis. Her performance not only invites a consideration of the strange intimacies of breathing in contemporary Beijing, it tactically recruits the bonds of matrimony to call for an accounting of responsibility and care (TallBear 2011; Todd 2017; de la Bellacasa 2011). As participants, witnesses, and wedding guests, Kong reminded those she met—both in person and online as her images went viral—of their duty to cut back emissions.



Figure 1. Kong Ning walks the smoggy streets of Beijing in “Marry the Sky.” Image by ChinaFotoPress, Beijing December 3, 2015.

Indeed, amid the atmospheric fallout of China's unprecedented development boom, every breath has become a reassertion of shared dependencies, complicities, and commitments. In Beijing, the acrid fog that habitually engulfs the city is made up of a mixture of nitrates, sulfates, carbons, dust, sand, and a shifting compilation of organic and inorganic chemicals (Bai 2015; Lang et al. 2017; Jia and Wang 2017). With each breath, Beijing residents draw these substances into their bodies, confirming and extending their relations with coal, electricity, factories, cars, urban construction, and the region's rapidly expanding deserts (Zee 2017; Murphy 2017). And with each breath, they reaffirm their membership in a community of breathers (Choy 2011a), collectively bearing the shared, if uneven costs of China's vertiginous growth.

Alongside the growing social and economic stratification of breathing experiences in the capital, this article examines how shared exposure is here reconfiguring public life and landscapes through new solidarities and entwined fates. Confronting increasingly toxic futures, I describe how Beijing residents are mobilizing everyday devices, objects, and settings to cultivate new modes of atmospheric attention and affinity. Recent literature in STS has explored how airborne toxicities become knowable, eventful, or significant through recorded data, national and international indexes, and in the embattled experiences of the breathing body (Choy 2011b; Mitman 2007; Fortun et al. 2014; Kenner 2018). These analyses have furthered understandings of air as a biomedical fact, an embodied engagement, and a medium of social and economic differentiation. In this piece, however, I focus on emergent modes of connection arising amid China's air pollution crisis to attend to the ways deadly air materializes within social registers. For millions of Chinese citizens that do not keep up with daily air quality readings or experience pollution as a physiological symptom, I suggest that the formation of what I call "respiratory publics" has been critical to shaping the lived experience of air pollution in China. Rather than focusing on an understanding of publics that emphasizes the linguistic or discursive terms of their constitution (Warner 2002; Anderson 1983), respiratory publics are particularly attentive to the socio-material conditions of collectivity and connection (Marres and Lezaun 2011; Marres 2012)—that is, the everyday objects and material environments in and through which groups of strangers come to collectively recognize themselves as "atmospheric subjects"—subjects for whom, as Tim Choy elucidates, "the air they breathe is precisely not second nature" (Choy 2011a, 17). In doing so, the article looks to expand STS scholarship on public participation outside of controlled experiments, pushing for a more robust consideration of the role publics play in lending epistemic weight to environmental issues.

This article draws from fieldwork conducted in Beijing from 2012-2017, archival and media sources, and critical engagements with China's public culture both online and on-the-ground (Rofel 2007). In what directly follows, I describe some of the forces that set the conditions for new modes of "atmospheric attunement" in the Chinese city (Stewart 2011). To trace these new sensibilities, I offer three sketches of what I am calling "respiratory publics"—assemblies of breathers that coalesce in and through distinct moments of Beijing's pollution crisis. Examining the efficacy of China's social media applications, the mobilization of facemasks, and Beijing's communal clean air spaces, I show how changes in the air are animating new forms of connection and convening (see Ahmann, this collection), as well as sensing and sensibility in the city. Each

section focuses on an overlapping yet distinct articulation of the air that materializes through everyday activities and habits: as, respectively, a problem space, an ethical imperative, and a common resource. Taken together, they demonstrate how quotidian practices, objects, and social life can serve as potent means to render air pollution real for breathing subjects. Ultimately, by tracking how respiratory publics take shape through these configurations, I show how air pollution not only acts as an agent of segregation and contamination, but how experiences of lived pollution might also work as a catalyst for the expansion of public life in contemporary China.

A City Under Siege

For all of its protean and ephemeral qualities, air exerts a remarkably muscular influence on urban form and contemporary life in China. In recent years, as the breakneck speed of China's development has altered the very chemistry of the atmosphere, record levels of smog have habitually smothered Beijing, swallowing up its avant-garde skyscrapers, closing airports and highways, and reorganizing the city into new spaces of insulation and fortification as residents seek out respiratory refuge (Zee 2015). In 2014, amid one of the most severe stretches of air pollution to strike the country, Premier Li Keqiang declared a "war against pollution," vowing that the state would address the problem with "an iron fist."² Broadcast over national television, Li's bellicose rhetoric both amplified and reflected a growing sense that Beijing was a city under siege. Leading up to this announcement, air pollution in Beijing had reached 30 to 45 times over the amount the World Health Organization (WHO) considers safe, with concentrations of particulate matter exceeding current scales and capacities of measurement (Greenstone and Schwarz 2018).

Caught between both the historic speed of its industrialization and the country's prolific urbanization,³ China had managed to combine the toxic potency and chemical unpredictability of what had been two separate eras of pollution for Europe and North America (Han et al. 2018). As it would turn out, mixing the particulates and sulfur dioxide of extensive coal combustion with the lead, nitrogen dioxide, and contaminants of newly introduced motor vehicles produces a novel, if lethal, late-industrial cocktail (Kulmala 2015). Recognizing the severity of the situation and the need to manage industrial holdovers alongside its modern development program, Li's declaration came as the culmination of escalating state efforts to address the quality of the

² On March 4, 2014, China's premier Li Keqiang announced to almost 3000 delegates gathered at the National People's Congress, as well as many more watching on live state television, "We will resolutely declare war against pollution as we declared war against poverty." <https://www.reuters.com/article/us-china-parliament-pollution/china-to-declare-war-on-pollution-premier-says-idUSBREA2405W20140305> On the historic and contemporary imbrications of atmospherics and war, see Masco 2010 and Sloterdijk 2009.

³ China is currently in the midst of executing a world historic urbanization program that aims to move 250 million rural residents into cities in towns within the next twelve years. If successful, it would constitute the largest human migration in history. See Zhou (2014) for a summary of the thirty-chapter document, or full details of the plan at: http://www.gov.cn/zhengce/2014-03/16/content_2640075.htm

country's air: in 2012, the state council ordered stricter air pollution monitoring standards to be implemented across cities, requiring new metrics to now include levels of ozone and P.M. 2.5, particulate matter below 2.5 microns in diameter; in 2013, it began publishing official daily readings of the Air Quality Index (AQI),⁴ making the data widely available to concerned citizens.

As the real-time quantification of air pollution transformed anonymous grey haze into color-coded systems of alarm, a visceral awareness of the perils of breathing in the Chinese city began to take shape. Endeavoring to sufficiently insulate, purify, and negotiate their atmospheres (see Sloterdijk 2009), many Beijing residents turned to the latest air monitoring devices and purifiers for home, school, and work, with pollution masks and built-in car filters to safeguard them between these points. Dividing the city into a series of protected insides and precarious outsides, filtration technologies generated new spaces of aerial segregation and "respiratory privilege" (Zee 2015),⁵ while daily AQI readings reoriented social life toward the dangers and imperatives of urban air. As one of my Beijing neighbors once remarked, "In China we are used to poisons in our water and in our food, but now, even going outside can kill you."

Noxious pollutants now migrate across and between boundaries, trespassing into countries, homes, and human and non-human bodies. Such an inability to contain, seal-off, or export the externalities of China's extraordinary growth recalls many of the hallmarks of late-industrialism (Fortun 2014). Today, even as China begins to transition away from heavy industry and manufacturing toward technology and service sectors, both the country's present and aspirational futures continue to be fuelled largely by coal (Hart, Bassett, and Johnson 2017). As the contaminants released are inhaled, normalized—even desired by a new class of Chinese consumers that covet and depend on toxic products (see Weston 2012), complex relations between eco-systems, human health, and individual choices have come to define China's late industrialism. Amid these increasingly intimate imbrications, networks of connection and affinity are taking shape to alert a growing cohort of breathers to invisible aerial hazards, cultivating new capacities to manage uncertain atmospheres in the process.

Respiratory Publics

Today, across a variety of disciplines looking to address the escalating and reverberating environmental crises that define our modern epoch, scholars are increasingly turning their attention to the atmospheres that surround them. Much of this work has been a critical examination of the violence of particular atmospheres, including gas warfare (Sloterdijk 2009), nuclear bomb testing (Masco 2006, 2009), as well as the accumulative injuries of toxic exposure and chemical infrastructures (Fortun 2001; Petryna 2013; Murphy 2013). Air pollution, like much

⁴ It is worth noting here that the US embassy began publishing hourly updates of AQI taken from the roof of its building in Beijing five years earlier, in 2008. The readings were made available on the embassy's Twitter page, ostensibly for the benefit of expats and American visitors. Twitter is officially banned in Mainland China, and inaccessible without access to a virtual private network (VPN) to jump China's firewall. <https://www.nytimes.com/2011/11/05/world/asia/the-privileges-of-chinas-elite-include-purified-air.html>

environmental fallout, is particularly insidious because it often takes the form of the uneventful: “low in immediate drama but high in long term consequences” (Nixon 2006, 18). As Rob Nixon has cogently argued, it is precisely the long duree of slow violence that renders its belated and diffuse causalities all the more difficult to account for (Nixon 2011; see also Fortun 2012)

If one of the primary difficulties of attritional calamities like air pollution is the imaginative challenge it poses to scholars, legislators, and activists alike,⁴ respiratory publics help draw attention to the amorphous qualities of the air by mobilizing everyday devices, objects, and settings to transform the atmosphere into a site of daily intervention. Indeed the potency of respiratory publics lies in their uneventful nature, evoking an atmospheric recognition based on prosaic encounters and the day-to-day experiences of “lived pollution.” Today in Beijing, as “the Chinese dream” threatens to dissolve under a veil of smog, many residents are being alerted to the dangers of their ambient atmospheres not through quantitative data or even the embodied experiences of embattled lungs, but instead through the accumulation of public responses to the reported air pollution crisis. For even as the privileged and more affluent in the city are able to bunker down and cover up, splintering the capital into new spaces of aerial fortification and containment (Zee 2015), such measures join a growing aggregate of highly-visible reactions to the air, evoking new atmospheric attunements as they reshape urban form and city life. Taken together, these responses make up what I call respiratory publics: disparate actors that initiate a process of collective attunement to the atmosphere through uncoordinated daily observations, precautions, and practices of pollution management. Emerging both online and outside, respiratory publics are composed of breathers made viscerally aware of their vital dependency on shared substances and circulations in a “world of conjoined but unequal fate” (Choy 2011, 14).

In a now infamous passage in *The Public and Its Problems* (1976), John Dewey offered the following definition of a public: “The public consists of all those who are affected by the indirect consequences of human action, to such an extent that it is deemed necessary to have those consequences systematically cared for” (15-16). Shifting the theorization of publics away from their organization, operations, and content, Dewey emphasized that publics arise amid particularly problematic effects—effects that demand a collective rather than individual response (see also Callon, Lascoumes, and Barthe 2009). In this way, Dewey looked to engage with a wide range of transformations and challenges that marked the beginning of the twentieth century, including the growing complexity and fragmentation of an increasingly technological and industrial society. With this deliberately dynamic definition, Dewey prefigured many contemporary understandings of the public that have developed in response to environmentalism and globalization by laying the groundwork for conceptualizing “communities of the affected” (Marres 2012, 43).

My conceptualization of respiratory publics draws upon Dewey to posit a public that is formed by means of the dynamic communications, connections, and temperamental atmospheres that surround particular events and issues of air pollution. In this sense, respiratory publics mimic the multiple and amorphous nature of their aerial entanglements: bound together if only

⁴ See Nixon 2006 for an elucidation of the representation bias against slow violence.

by the necessity of breath, collective action here most often takes the form of daily practices of atmospheric attunement and negotiation—acts that are anchored in and expressed through the shared experience of breathing in a polluted city. Yet as feminist scholars of STS have elucidated, toxicity is a temporally and contextually specific interaction between diverse and distributed bodies (Chen 2012; Mol 2002). In this context, Tim Choy explains, “the common-hood of breath is not one of equivalence, but partial connection and potential resonance” (Choy 2011a, 14). Relying on a reflexive recognition of both particulate and discursive circulation among an unequal and indefinite number of addressees (see Warner 2002), respiratory publics forge their legitimacy through the shared medium of air itself. Only here, air is both the medium and message.

The field of STS has sustained a keen interest in public participation since its very inception and long been an advocate of greater public involvement in science and technology. While many STS scholars have fruitfully explored the ways publics are produced by the very methodologies used to solicit their participation (Braun and Shultz 2010; Felt and Fochler 2010; Horst and Irwin 2010; Marres 2012; Stengers 2000; Tironi 2015), considerably less has been said about the ways publics might independently coalesce and mobilize outside of experimental settings and participatory exercises to render perceptible the qualitative conditions of toxicity. In this way, respiratory publics offer a critical provocation that has not been fully acknowledged in STS literature: namely, how people come to know and care about environmental problems outside of the exclusive domain of scientific expertise, whether in the lab, in published reports, or through biomedical diagnoses disconnected from everyday life (Taylor and Buttel 1992). Often including but exceeding data metrics, respiratory publics remind us that toxicity extends beyond bioscientific forms of knowledge to social and cultural understandings (Gugliotta 2003; Liboiron 2016).

Respiratory publics make invisible threats visible without the use of air sensors or embodied knowledge. Instead, they mobilize social networks to make air a public object of concern and a personal issue of significance (Calvillo 2018). A self-organized relation among strangers that might share nothing but the necessity to breath or the nostalgia for blue skies, respiratory publics approach air pollution through specific and situated instances of its effects on particular people in particular places. As Nerea Calvillo articulates, these “shorter-term and isolated forms of paying attention to toxicity” expand realms of accountability and intervention by extending regimes of perceptibility beyond quantified metrics (Calvillo 2018, 382). To explore this in greater detail, I now turn to three preliminary sketches of Beijing’s emergent respiratory publics to consider the everyday devices, objects, and settings that render air legible as an object of concern and daily intervention.

In the Air, In the Cloud

Mrs. Fan enjoys flowers in bloom, putting her own witty spin on Chinese literary quotes, and the latest fitness and beauty tips. Working at a store that specializes in traditional Chinese dresses, she has an air of constant activity about her. All of this is readily apparent from her personal feed on WeChat, one of China’s most popular social media applications. Mrs. Fan lived next door to

me in Beijing, our courtyard homes sharing an adjoining wall and tiled roof. Her teenage daughter would often seek me out for help with English homework and her husband, a China Post mail carrier, was always ready to help with any small household repairs I might need. Yet, despite my daily interactions with Mrs. Fan and her family, I often learned unexpected details about her through her online posts and uploaded photos.

From 2014 to 2016, the number of social network site users in China grew from 453 million to 514 million, with nearly 85% of those users obtaining access through mobile devices (Chen and Cheong 2019; Kantar 2015). In 2017, the number of active smartphone users in Mainland China on WeChat was just under 500 million, and in 2018 the application accounted for 34% of total mobile data traffic in the country (Iqbal 2019). Although the platform's messaging and payment services are among the most widely used elements of the application, its *pengyou quan* function, translated in English as "Moments," is another highly additive feature that allows users to share and view updates from their contacts.⁷ It is here that Mrs. Fan routinely posts photos of cute animals and links to articles on healthy eating habits. But at the beginning of a dry and frigid winter in 2015, she posted something rather anomalous: an image of a Beijing street cloaked in smog (Figure 2).



Figure 2. Beijing through the smog. Image licensed under Creative Commons.

⁷ To view WeChat's own annual report of the application's data and usage, visit: <https://support.weixin.qq.com/cgi-bin/mmsupport-bin/getopendays?from=singlemessage>

Taken on her morning commute to work, the image bore no caption. When I later asked her about why she had posted it, she initially deferred, laughing bashfully before shrugging and remarking “I don’t know...I go by there every day, [but] on that day it just looked so strange in the fog.” In Chinese, the words for both fog and smog are rendered as *wu*, the semblance pointing to a sensory as well as semantic shift in recent years as weather and pollution collide and require demarcation. In Mrs. Fan’s usage, its ambiguity is indicative of a particular moment in the Chinese popular imaginary, when a change in the air could be readily detected, but its contents and significances remained uncertain. With her photo, Mrs. Fan effectively marked this shift: both the ostensible “before” that distinguished the scene as noteworthy of documentation, as well as the dubious future it foretold.

A rendering of air uploaded into the cloud, Mrs. Fan’s photograph was hardly unique. Indeed it was likely that she herself had already come across a similar photo in her own newsfeeds. In the last decade, China’s netizens have flooded the Internet with poignant images of their own views of the pollution crisis. Today, WeChat and Weibo, China’s popular microblogging site, are routinely crowded with personal chronicles of smog.⁵ Snapping photos in front of disappeared urban landmarks, from high-rise apartment windows, or from the ground up, Beijing inhabitants avidly document their quotidian airscapes. Circulating online, they accrue a cumulative potency that at once normalizes and sensationalizes Beijing’s urban pall, drawing attention to the air as a subject worth documenting. In the early days of the crisis, before official readings of AQI were made widely available, these seemingly innocuous photos evaded state censorship and helped to establish the severity and ubiquity of air pollution across Chinese cities (Xu 2019; Wang, Paul, and Dredze 2015). Taken together, the images painted an unsettling picture of China’s shifting atmospheres and placed additional pressure on the government to act (Mina 2019). When stricter controls and standards were finally mandated for all cities, state media outlet Xinhua readily acknowledged the prominent role China’s online publics had played, noting that, “A stirring campaign on the country’s social network websites [has] gained a satisfying response from the country’s policymakers.”⁶

Perhaps most notably, 55-year-old Beijing resident Zou Yi has gained national and international attention for his meticulous documentation of the city’s air. Each day, since January 2013, Zou has photographed the Beijing Television tower outside of his living room window and posted the image. Garnering millions of views, Zou’s feed provides a visual archive of Beijing’s pollution from a vantage point that is at once singular and widely recognizable. With this daily act, Zou depicts a city transformed by air, his images resonating most deeply with those that know the city, and that particular landmark, most intimately. In this way, Zou’s photographs have become profoundly participatory, eliciting both public and private commentary while encouraging others to post their own aerial perspectives.

⁵ To be sure, Chinese netizens also love posting image of blue skies, on the more rare occasions they occur. One popular hashtag that has emerged to describe such days is “APEC *lan*,” or “APEC blue,” which references the pristinely clear skies that materialized amid the annual gathering of the 2014 Asian-Pacific Economic Cooperation in Beijing—a direct result of stringent emissions controls put into effect by the Chinese government for the duration of the conference.

⁶ <https://www.theguardian.com/world/2012/mar/01/china-air-pollution-tough-rules>

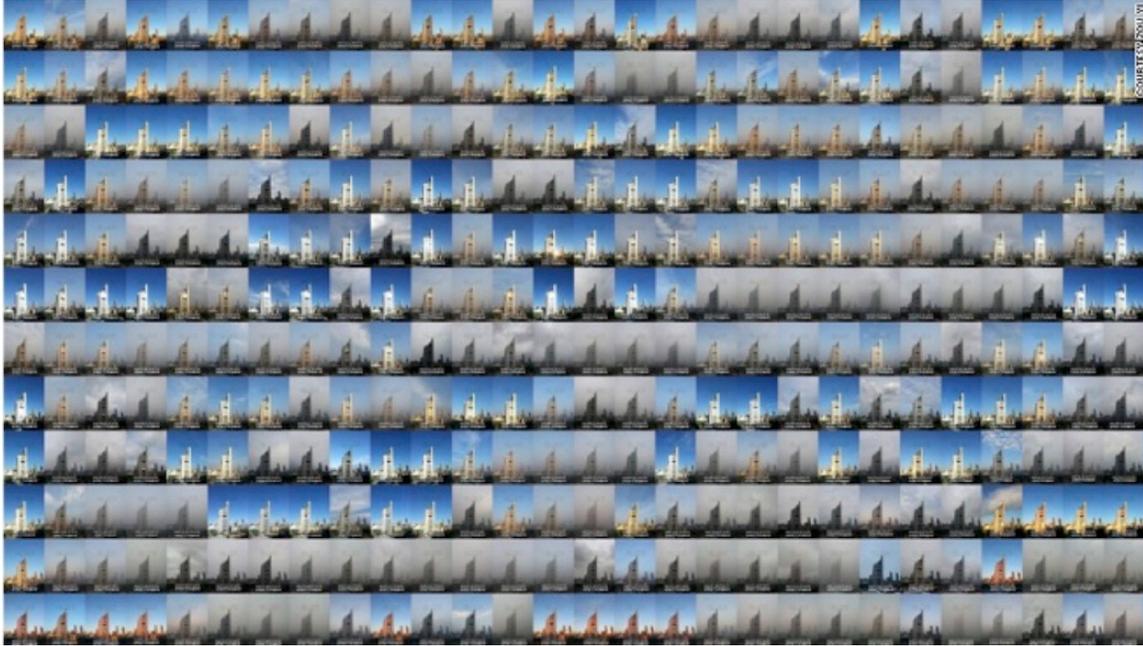


Figure 3. A mosaic of a year of Beijing's air. Image by Zou Yi, 2016.

Rendering the vicissitudes of Beijing air visible, Zou and Mrs. Fan's photos accrue potency in aggregate (Figure 3). En masse, the images redefine the speed and shape of an insidiously diffuse and protracted calamity. By providing an everyday accounting of their quotidian landscapes, the images infuse the slow encroachment of the air pollution crisis with a sense of urgency and spectacle dramatic enough to rouse public reaction and sentiment. Certainly the millions of views and comments solicited by Zou's archive, as well as the online attention that prompted the official publication of China's air quality data evidence this much. Capturing how a familiar city is made strange, these images mark the emergent attunements of a population made violently aware of changes in the air, hailing a respiratory public into being. Awakened to both the shared and shifting nature of their ambient atmospheres as they scroll their social media feeds, respiratory publics comment on, repost, and share smoggy photos of their own, drawing others into the sudden recognition of their aerial environments. For Timothy Choy and Jerry Zee, such "subjects of suspension are agitated into atmospheric recognition by proximity, into episodes and dealings with the condition of being surrounded and filled with the particles with which they share a medium" (Choy and Zee 2015, 215). In this way, an environmental crisis becomes both legible and actionable not through formal data dissemination, biomedical statistics, or even the individual experiences of breathing bodies, but through everyday practices of documentation and social networking. Circulating in the cloud, proliferating images of urban air imbed themselves in mainstream imaginaries, reflecting and reorienting urban life around the atmospheres that enfold it.

Alongside photos of urban smog, city residents have also added a growing collection of air mask selfies to their streams of content. These images have taken a variety of forms, from more light-hearted and playful portraits of “cute masks combatting ugly pollution,”¹⁸ to more solemn depictions of shrouded faces in a city transformed by the weight of its airy substantiations. In the next section, I turn from collective representations of urban air to consider the respiratory publics that have emerged around pollution masks, as technologies of aerial defense, everyday objects of care, and symbols of silent protest.

Behind the Mask

In February 2014, after six consecutive days of severe pollution warnings, students at Peking University discovered that even the statues on their campus had taken refuge behind pollution masks (Figure 5). Surreptitiously slipped over the bronze faces of historic figures during the night, the *kouzhao*, or cloth masks, bridged the promises of development with the suffocating reality of China’s economic development. As one netizen observed, “The statues would collapse if they had to breathe this smog without masks!”¹⁹ The sight of the PRC’s exalted heroes behind white masks was arresting, not least because it so succinctly conveyed the lived contradictions of narratives of progress. Here was economist Chen Daisun, liberal education advocate Cai Yuan Pei, and founding member of the Communist Party of China Li Dazhao, transformed from exemplars of a “great civilization” into nondescript urban breathers, their masked faces recasting them as anonymous and besieged respiratory systems. In this light, there was something curiously tender in the act of shielding their mouths and noses. For even in imagined vulnerabilities and exposures, air masks can be read as objects of care in a fraught urban airscape.

Such tactical urban interventions rely on the now mundane ubiquity and shared experience of donning an air mask in China. Deployed on a statue or sewn into a wedding gown by the artist Kong Ning, the mask becomes a discursive medium among otherwise distinct Chinese interlocutors. This is partly because the widespread usage of *kouzhao* in China both precedes and exceeds contemporary air pollution. Previous outbreaks of SARS (Zhan 2005), H1N1, and Avian influenza only reaffirmed what mask wearers in China had long known: the imperatives of protecting oneself from dangerous airs. Historian of medicine Shigehisa Kuriyama has elucidated the central role played by wind, *feng*, in a longer trajectory of Chinese medical conceptions of the body (1994). He explains that while a deep resonance existed between the body’s breath and its enveloping winds, there was also a significant amount of anxiety surrounding human susceptibility to chaos as their skin and pores left them open to variable and volatile currents. The mask then can be seen as the first defense in an unpredictable atmosphere (Zee 2015), an object that still invokes the embodied and existential dangers of bad air for many

¹⁸ See a catalogue of some of these mask selfies at: <https://kotaku.com/in-china-cute-masks-combat-ugly-pollution-5976347>

¹⁹ <https://www.chinasmack.com/face-masks-on-peking-university-statues-protest-beijing-smog>. Similar “silent protests” have subsequently occurred with statues in Chengdu and Xi’an.

in China. Yet as an everyday object that now recalls the fear and isolation air pollution has generated—cancelled school days, self-imposed quarantines, the sheathed faces of friends and loved ones—the mask also renders the lived effects of P.M. 2.5 visible and empathetic.

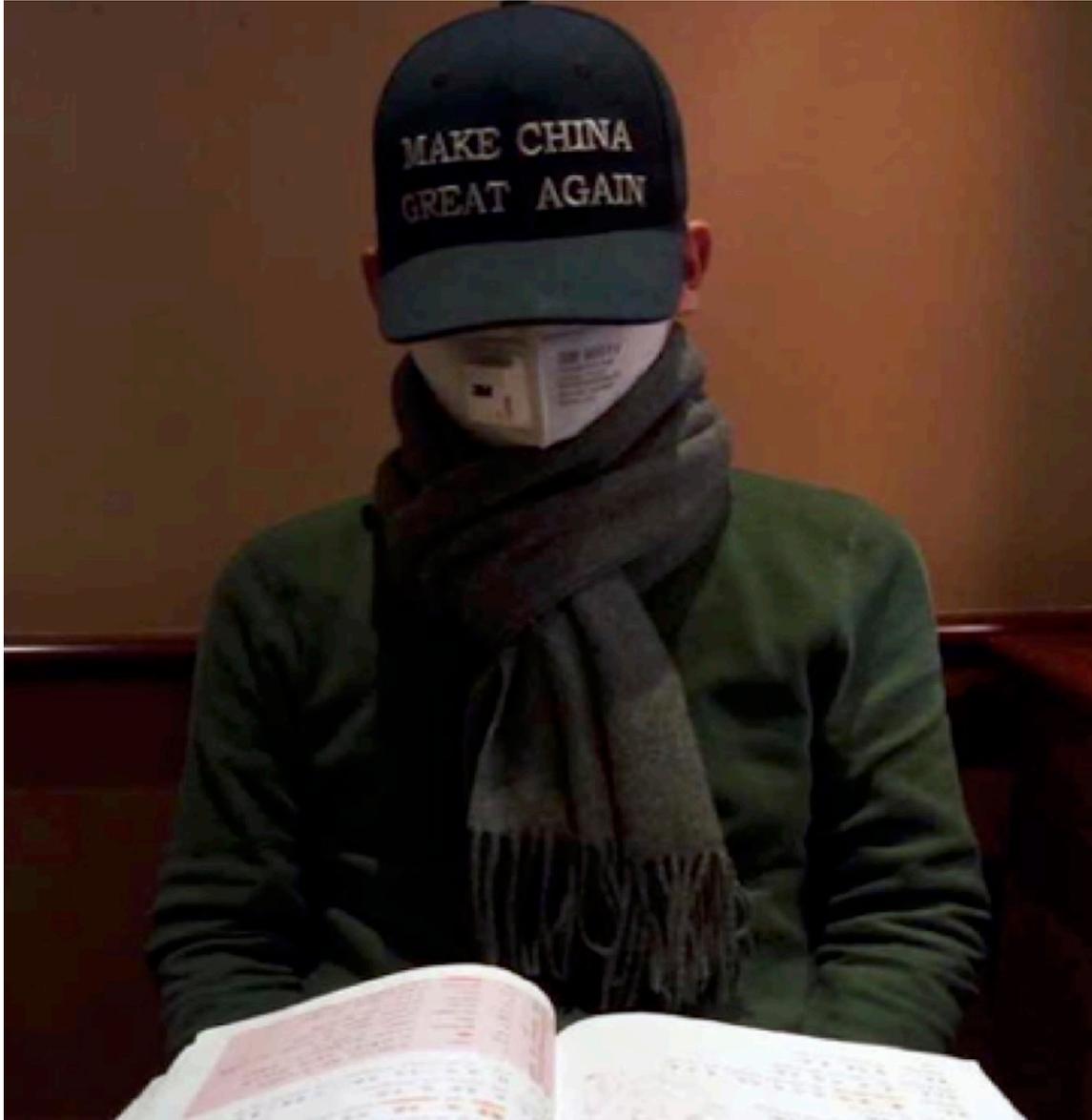


Figure 4. Photo by Author. Beijing, China 2016.



Figure 5. Peking University Statues. Image from Sina Weibo. Beijing, China, 2014.

In the historic neighborhood of Old Beijing, where grandparents assume a significant bulk of childcare responsibilities, facemasks are conspicuous objects of care; generational markers of biopolitical investments in children shaped by China's population policy. In the many conversations I have had with old city residents, any concerns about air quality that might come up were usually couched in terms of child welfare. "I don't usually wear [a mask], but these days I always make sure he wears one," one grandfather informed me, gesturing to his seven-year-old grandson. A retired driver now in his eighties, Mr. Ye lives with his wife in a modest but welcoming one-room home. His daughter has an apartment on the outskirts of the city but he frequently takes care of his grandson, picking him up and dropping him off at school when she is working long shifts at a travel company. Ye explains that he held off forcing the boy to wear a mask for some time, even against the wishes of his mother, not seeing the point in it. "But look around, now all the students wear them. There are even air purifiers in his classrooms." For Mr. Ye, it is not just that the hazards of air pollution are corroborated by collective reinforcement and social pressure, but that they are reframed as relations of care and responsibility, not for self, but others. When I gently chide him about why he does not take the same measures to protect himself, he smiles and replies, "I am already old, what use are those things to me?" With this remark, we arrive at his front door and Mr. Ye takes the mask from his grandson, folding it

carefully and tucking it into his coat pocket for tomorrow.

Transformed into an everyday object of care, the mask troubles a neat dichotomy between agency and passivity, reaffirming our vital entanglements and the precarious boundaries between people and their environments. Following Joan Tronto (1987), Maria de la Bellacasa has defined care as an expansive, “life-sustaining web”: “*everything we do to maintain, continue and repair ‘our world’ so that we can live in it as well as possible*” (2017, 3, emphasis in original). Drawing on this definition, the mask functions to both protect and preserve vulnerable loved ones as well as reaffirm the intimate entanglements between breathing subjects and the atmospheres they are embedded in. Circulating among respiratory publics, the masks decenter human agencies even as they remain close to the predicaments and consequences of human activities and choices. Finding themselves tethered together by airy emissions and transmissions, respiratory publics assert a communal vulnerability to toxic exposures—a biological imperative to breath that is slowly killing them.

As facemasks mushroom across the city, they highlight the new ethical and social imperatives that have emerged around air pollution in contemporary China. For while air pollution is clearly an assault on the systems that enable life (Sloterdijk 2009), it is also not solely or even uniformly an experience of the breathing body. In these instances, the mask itself becomes a primary vehicle for representing invisible aerial hazards, giving shape to amorphous dangers. Multiplying across urban streetscapes, masks silently address a respiratory public made cognizant of shared susceptibilities, impelling the proliferation of additional masks as a habitual necessity in the city. Drawing attention to the potential, undetected dangers lurking in the air, respiratory publics lend social and ethical weight to environmental problems that challenge awareness at multiple scales. Thus threats to health become substantiated in a schoolyard full of children donning air masks and filter technologies that make classrooms more inhabitable for formative lungs. Where images of urban air capture economies of attention by colonizing social media feeds, here the mask operates in real time to signal a collective threat, infusing the slow violence of air pollution with a sense of urgency while also offering a simple and inexpensive solution. If circulating photos of smog enforced the prevalence and persistence of an air pollution crisis, the proliferation of air masks on the urban landscape connects this abstract crisis to individual bodies, accentuating their vulnerabilities to exposure and the imperatives of defense. Donning a mask each day—or carrying one around in your pocket for a loved one—renders air pollution a material and habitual reality for many who might otherwise gloss over air quality metrics as superfluous concerns. In this way, respiratory publics that emerge around and in response to proliferating masks prompt an aerial attunement to both real and perceived environmental perils, their sheathed faces providing a powerful visualization of bodies no longer at home in their ambient atmospheres.

Aerial Commons

Two stories below Beijing’s smog-shrouded streets, inside its subterranean city (*dixia cheng*), your pollution mask suddenly seems redundant. Indeed, at the height of Sino-Soviet tensions in 1969,

a self-contained air-space is precisely what the original architects of the Beijing's sprawling bomb shelter network intended as they laid down plans for approximately ten thousand bunkers and labyrinthine tunnels (Goel, Singh, and Zhao 2012). Outfitted with elaborate ventilation systems and airshafts that could be sealed off in the event of chemical warfare, the underground city was designed to provide six million Beijing residents with respiratory refuge in the event of a nuclear or biochemical attack.²² Decades later, as these threats receded and China's economy liberalized, shelters no longer needed for strategic military and security purposes were leased out to landlords and developers who turned the spaces into shopping arcades, budget hotels, and perhaps most infamously, cheap housing for students, migrants, and service sector workers.²³ In 2015, another alternative emerged as the new Beijing start-up Digua Shequ (Sweet Potato Community) transformed its first unused bomb shelter into a renewed community space for both under and aboveground residents.²⁴ In this second life, the fortified chambers and passageways of the underground city once again offer Beijing inhabitants a form of respite against what Elias Canetti has called "the defenselessness of breathing" (Canetti 1979; Nieuwenhuis 2015). Today, however, rather than insulating the population from foreign assault, the underground city shelters residents from the noxious aerial signature of rapid development.

Down a dark concrete ramp and two winding flights of stairs, Digua is a consummately cheery place (Figure 6). Its walls are painted in yellow with colorful strings and paper crafts that hang from the low ceilings. The community center includes a library, café, exercise room, hair salon, and children's play area—all conventional neighborhood amenities, only here they are entombed in concrete several meters below ground. "It's always busier here when the pollution is bad," Lili, a community engagement coordinator, tells me. Digua realized early on that providing a respiratory refuge would be one of center's primary draws. Lili explains that creating a new kind of public space, where people could both socialize and be physically active, was a primary aim of Digua. "Especially with the air pollution as bad as it is," she adds. To this end, Digua was not only hermetically sealed off from aboveground pollutants, several high-performance air filters hummed through its corridors. As Lili and I chat, children dart from room to room, their watchful grandmas and grandpas shuffling after them. With the neighborhood's middle-aged residents still at work, Digua had managed to gather together the remaining young and elderly—

²² At the time, 6 million was approximately 40% of the population of Beijing. It was assumed that the remaining populace would evacuate or find other modes of shelter.

²³ In the 1980s, as China liberalized, many bunkers were handed over to neighborhood authorities who in turn leased them out to developers and other businesses. Most were converted to sparse living spaces rented out to migrant workers looking for an alternative to Beijing's soaring real estate prices. Residents of the underground city, disparagingly referred to as the "rat tribe" (*shuzu*) by media outlets, are able to rent units for roughly a third of what it would cost to live above ground (roughly \$77-138 USD) (see <https://www.nytimes.com/2016/03/22/world/asia/beijing-bomb-shelters.html>). However, in 2010, Beijing officials announced that residential use of underground spaces would be illegal by 2012, a deadline that was later extended to 2017. During my fieldwork from 2015-2017, there still seemed to be little to no enforcement of this ban. What to do with the thousands of people living in bunkers—estimated to range from 150,000 to one million residents—remains a pressing issue.

²⁴ The Civil Air Defense Department of Beijing presently grants one-year leases on former bomb shelters to individuals and companies.

populations most vulnerable to the effects of air pollution (Makri and Stilianakis 2008)—inside its reinforced walls.

One regular visitor, Ju Biyu, a 67-year-old retiree, tells me that these days the community center often takes the place of city parks she used to frequent for daily exercise. While she began to visit Digua out of convenience—her home just across the street—she now prefers to make use of the recreation spaces on particularly smoggy days, not least because much of her social circle has also moved indoors. “Parks and squares are nearly empty on the worst days...its better to stay inside if you can,” she notes. In recent months, both her old friends and new acquaintances have all quietly migrated into the space, occupying the tables with games of cards, perusing the daily papers, and practicing calisthenics in the activity room. “I’ve lived here my whole life but never talked to any migrants or people living in the underground units before. Now we all know each other!” Replacing open spaces and closed social networks with insulated rooms and more expansive connections, Digua entices users like Ju with neighborhood conveniences, novel settings, and the potential for new relationships, providing a pivotal respiratory refuge in the process.

Today, spaces like Digua join the Beijing National Museum and a growing number of shopping malls in the capital offering up free, purified air to the public.¹⁵ In a city increasingly characterized by the commodification of clean air—through high-priced filtration technologies, insulated offices and homes, and “lung wash” vacations¹⁶—the community center redistributes air, “the last common property,” back to the people (Canetti 1979, 13). Digua, then, is not only a community of residents, but a respiratory public united by the necessity of breath and connected by an atmosphere of mistrust as they negotiate the unseen perils outside and above. Where social media images of urban smog and the proliferation of air masks discussed above rely on everyday devices and objects to prompt atmospheric attention, Digua’s approximation of an urban neighborhood inside its insulated walls attunes breathers to the air around and outside by shifting social life inside and underground. A negative image of the city above, Digua’s interiors throw into sharp relief states of containment and exposure, protection and vulnerability, simply by offering a viable alternative to potentially contaminated airspaces. As respiratory publics increasingly move urban life and collective activities inside, they rouse awareness to the potential dangers lurking in the atmosphere. In this regard, “lived pollution” becomes all the more real for Beijing residents surveying newly abandoned outdoor spaces of leisure and congregation, or retreating indoors to join their family and friends.

¹⁵ Certainly an argument can be made here that, as spaces of capital and ubiquitous consumption, shopping malls are not truly ‘public’ spaces. I take this point but would counter that, in China in particular, shopping malls (and indeed even fast-food restaurants like KFC and McDonald’s) are more readily appropriated as public spaces where students, elderly, family members and friends meet and gather, often with no intention (or pressure) to purchase anything at all. At Raffles City, an immaculate multi-floor shopping mall not too far from where I lived in Beijing, I was impressed to see families pack full meals to enjoy in the mall’s plaza, high school students completing their homework after school in the food court, unabashedly asking for refills of free hot water, and mothers that would use the mall’s bathroom sinks to wash up their babies.

¹⁶ <https://www.forbes.com/sites/profdrwolfganggarlt/2017/01/05/chinese-online-travel-agency-publishes-haze-travel-list/#6cd8a45050dc>

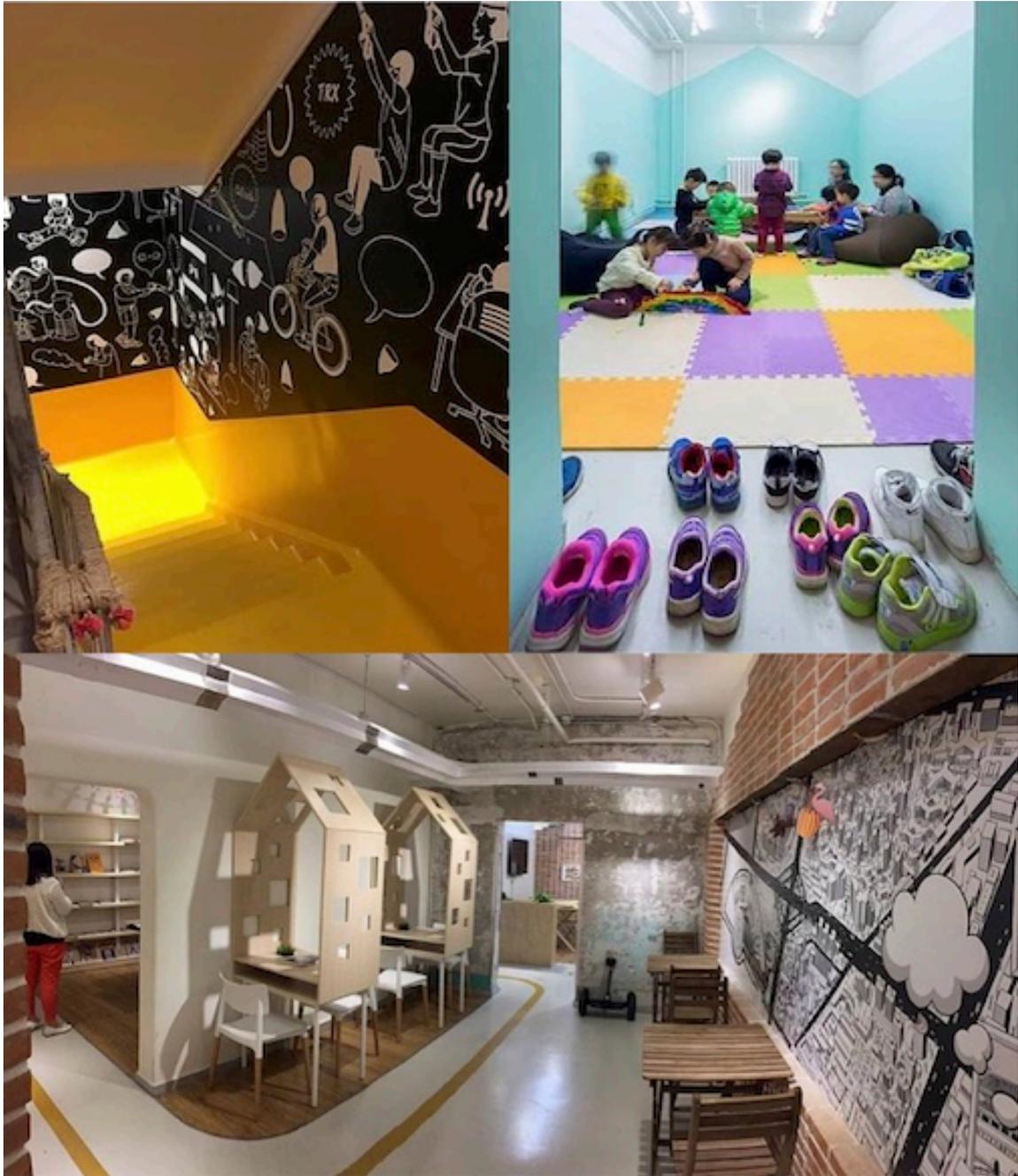


Figure 6. Clockwise from top: Stairs leading down to Digua Shequ; one of the center's playrooms; a view of the desks and library. Photos from Digua Shequ Weibo page, Beijing 2016.

Conclusion: Between Air and Qi

Modern conceptions of air are often expressed in Chinese using the word *qi*: *kongqi* (air), *tianqi* (weather), *qixiangxue* (meteorology). A foundational concept in Chinese medicine, *qi* denotes the essential life-sustaining force that undergirds and propels all things, human and non-human, animate and inanimate. *Qi* is simultaneously “that which makes things happen in stuff” and “the stuff in which happens” (Sivin 1987). The correspondences with air here are readily apparent. Life takes place in air, through air, and, amid the pall of late industrialism, is increasingly remade and unmade by air (see Latour 2005). *Qi* as air draws our attention to fundamental environmental and non-human entanglements, as well as our bodily capacities for both vitality and vulnerability. But much is also lost in the contemporary reduction of *qi* to air.

Historian Ruth Rogaski describes how laboratory definitions of air as gas were introduced to China through the term *qi* at the turn of the century, allowing Chinese physicians to establish creative correspondences between air and *qi* that encompassed gases, vital energies, as well as invisible and even transcendent forces (Rogaski 2019). Over time, however, these rich valences and intersections were supplanted by modern notions of air as a laboratory object: made up of quantifiable liquids, solids and gasses, Chinese air retained its linguistic linkages to *qi*, but lost the conceptual breadth and extra-ordinary qualities associated with the term.⁷ Thinking with respiratory publics is a step toward restoring the multivalence of air, shifting analysis beyond the sum of its discrete parts and chemical components toward the everyday relations and entanglements that give it meaning.

Attending to how China’s respiratory publics contribute to everyday experiences and understandings of air pollution also enriches STS approaches to public participation, pushing for additional analyses beyond the laboratory and the controlled settings of experiments. Public engagement does not exclusively take the form of empowering particular communities and actors, but also acknowledging how these groups might independently shape and lend epistemic weight to environmental problems. To fully account for this, STS scholars must be willing to expand their fieldsites to include everyday settings where these issues materialize for people—a particularly critical proposition when we consider the failures of late-industrial experts and infrastructures to contain the externalities of production and consumption (Fortun 2012). For while recorded data and strained pulmonary systems may make air pollution more tangible—or legally actionable—for some, the majority of those living under the haze of late-industrial air are stirred into atmospheric recognition through more quotidian modes of relation.

Rob Nixon has articulated that one of the principal challenges to addressing slow-acting environmental violence is the representational dilemma it poses to both activists and publics (2017). He asks, “How, in an age that venerates the instant and the spectacular, can one turn attritional calamities starring nobody into stories dramatic enough to rouse public sentiment?” (Nixon 2006, 1). In China’s diffuse and often opaque air pollution crisis, respiratory publics offer

⁷ Rune Svarverud offers a fascinating examination of the complex linguistic search for a Chinese translation that would be able to capture the specificities of air, a process he called “the terminological battle for air” in modern China (Svarverud 2014).

one such means to concretize an amorphous threat unequally distributed across space and time. Rather than taking on air pollution as a whole, respiratory publics are concerned with the particular contexts and practical effects of Beijing's smog—as it transforms local neighborhoods, daily habits, and social spaces. They illuminate the qualitative and lived aspects of pollution, emphasizing the importance of day-to-day practices, objects, and relations that render toxicity legible. In this view, posting a photo of urban smog, donning an air mask, or visiting a community center can be seen as the uneventful ways Beijingers live with and in air pollution, reorganizing urban life and stirring up new sensitivities and sensibilities in the process. In each of these practices, collective life—whether virtual, representative, or physical—informs how air comes to matter. Through the respiratory publics that connect online, behind facemasks, and inside purified air spaces, new attunements to the atmosphere are awakened, transforming air from the medium of everyday life to an object of concern and daily intervention.

Author Biography

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References

- Anderson, Benedict. 1983. *Imagined Communities*. London: Verso.
- Braun, Kathrin, and Susanne Shultz. 2010. "... A Certain Amount of Engineering Involved': Constructing the Public in Participatory Governance." *Public Understanding of Science* 19 (4): 403–19.
- Callon, Michel, Pierre Lascoumes, and Yannick Barthe. 2009. *Acting in an Uncertain World: An Essay on Technical Democracy*. Cambridge, MA: MIT Press.
- Calvillo, Nerea. 2018. "Political Airs: From Monitoring to Attuned Sensing Air Pollution." *Social Studies of Science* 48 (3): 372–88. <https://doi.org/10.1177/0306312718784656>.
- Canetti, Elias. 1979. *The Conscience of Words*. New York: Seabury Press.
- Chen, Mel. 2012. *Animacies: Biopolitics, Racial Mattering and Queer Affect*. Durham N.C.: Duke University Press.
- Chen, Yashu, and Pauline Cheong. 2019. "'Airpocalypse' and the China Smog Crisis: Examining Online and Offline Civic Engagement Motives, Attention, and Actions." *International Journal of Communication* 13: 693–714.
- Choy, Timothy. 2011a. "Atmospherics: On Substances and Subjects in Suspension." Paper presented at the "Fact/Value" workshop, University of Chicago, June 3–4.
- . 2011b. *Ecologies of Comparison: An Ethnography of Endangerment in Hong Kong*. Durham: Duke University Press. <https://catalog.lib.uchicago.edu/vufind/Record/8532942>.
- Choy, Timothy, and Jerry Zee. 2015. "Condition—Suspension." *Cultural Anthropology* 30 (2): 210–23.
- Dewey, John. 1976. *The Public and Its Problems*. Chicago: Swallow Press.
- Felt, Ulrike, and Maximilian Fochler. 2010. "Machineries for Making Publics: Inscribing and Describing Publics in Public Engagement." *Minerva* 48 (3): 219–38.
- Fortun, Kim. 2001. *Advocacy After Bhopal: Environmentalism, Disaster, New Global Orders*. Chicago: University of Chicago Press.
- . 2012. "Ethnography in Late Industrialism." *Cultural Anthropology* 27 (3): 446–64.
- . 2014. "From Latour to Late Industrialism." *HAU: Journal of Ethnographic Theory* 4 (1): 309–29. <https://doi.org/10.14318/hau4.1.017>.
- Fortun, Kim, Mike Fortun, Erik Bigras, Tahereh Saheb, Brandon Costelloe-Kuehn, Jerome Crowder, Daniel Price, and Alison Kenner. 2014. "Experimental Ethnography Online: The Asthma Files." *Cultural Studies* 28 (4): 632–42. <https://doi.org/10.1080/09502386.2014.888923>.
- Goel, R. K., Bhawani. Singh, and Jian Zhao. 2012. *Underground Infrastructures: Planning, Design, and Construction*. Waltham, M.A.: Elsevier.
- Greenstone, Michael, and Patrick Schwarz. 2018. "Air Quality Life Index: Is China Winning Its War on Pollution?" Chicago.
- Gugliotta, A. 2003. "How, When, and for Whom Was Smoke a Problem in Pittsburgh and Its Region." In *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region*, 110–25. Pittsburgh, PA: University of Pittsburgh Press.
- Han, Lijian, Weiqi Zhou, Steward T.A. Pickett, Weifeng Li, and Yuguo Qian. 2018.

- "Multicontaminant Air Pollution in Chinese Cities." *Bulletin of the World Health Organization* 96 (4): 233-242E. <https://doi.org/10.2471/BLT.17.195560>.
- Haraway, Donna. 2016. *Staying with the Trouble: Making Kin in the Chthulucene*. Durham N.C.: Duke University Press.
- Hart, Melanie, Luke Bassett, and Blaine Johnson. 2017. "Everything You Think You Know About Coal in China Is Wrong." Washington, D.C.
- Horst, Maja, and Alan Irwin. 2010. "Nations at Ease with Radical Knowledge: On Consensus, Consensusing and False Consensusness." *Social Studies of Science* 40 (1): 106–26.
- Iqbal, Mansoor. 2019. "WeChat Revenue and Usage Statistics (2019)." *Business of Apps*. 2019. <https://www.businessofapps.com/data/wechat-statistics/>.
- Jia, Heping, and Ling Wang. 2017. "Peering into China's Thick Haze of Air Pollution." *Chemical and Engineering News* 95(1): 19–22. <https://cen.acs.org/articles/95/i4/Peering-Chinas-thick-haze-air.html>.
- Kantar. 2015. "China Social Media Impact Report 2015." 2015. <https://us.kantar.com/tech/social/2015/kantar-china-social-media-impact-report-2015/>.
- Kenner, Alison. 2018. *Breathtaking: Asthma Care in a Time of Climate Change*. Minneapolis: University of Minnesota Press.
- Kulmala, Markku. 2015. "Atmospheric Chemistry: China's Choking Cocktail." *Nature*. Nature Publishing Group. <https://doi.org/10.1038/526497a>.
- Kuriyama, Shigehisa. 1994. "The Imagination of Winds and the Development of the Chinese Conception of the Body." In *Body, Subject, and Power in China*, edited by Angela Zito and Tani Barlow, 23–41. Chicago: University of Chicago Press.
- la Bellacasa, Maria Puig de. 2011. "Matters of Care in Technoscience: Assembling Neglected Things." *Social Studies of Science* 41(1): 85–106. <https://doi.org/10.1177/0306312710380301>.
- Lang, Jianlei, Yanyun Zhang, Ying Zhou, Shuiyuan Cheng, Dongsheng Chen, Xiurui Guo, Sha Chen, Xiaoxin Li, Xiaofan Xing, and Haiyan Wang. 2017. "Trends of PM 2.5 and Chemical Composition in Beijing, 2000-2015." *Aerosol and Air Quality Research* 17: 412–25. <https://doi.org/10.4209/aaqr.2016.07.0307>.
- Latour, Bruno. 2005. "Air-Condition." In *Sensorium: Embodied Experience, Technology, and Contemporary Art*, 104–8. Cambridge, MA.
- Liboiron, Max. 2016. "Redefining Pollution and Action: The Matter of Plastics." *Journal of Material Culture* 21(1): 87–110. <https://doi.org/10.1177/1359183515622966>.
- Makri, Anna, and Nikolaos I. Stilianakis. 2008. "Vulnerability to Air Pollution Health Effects." *International Journal of Hygiene and Environmental Health* 211 (3–4): 326–36. <https://doi.org/10.1016/j.ijheh.2007.06.005>.
- Marres, Noortje. 2012. *Material Participation: Technology, the Environment and Everyday Publics*. New York: Palgrave Macmillan.
- Marres, Noortje, and Javier Lezaun. 2011. "Materials and Devices of the Public: An Introduction." *Economy and Society* 40 (4): 489–508. <https://doi.org/10.1080/03085147.2011.602293>.
- Masco, Joseph. 2006. *The Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico*. Princeton, N.J.: Princeton University Press.

- . 2009. "Bad Weather." *Social Studies of Science* 40 (1): 7–40. <https://doi.org/10.1177/0306312709341598>.
- Mina, An Xiao. 2019. *Memes to Movements: How the World's Most Viral Media Is Changing Social Protest and Power*. Boston: Beacon Press.
- Mitman, Gregg. 2007. *Breathing Space: How Allergies Shape Our Lives and Landscapes*. New Haven: Yale University Press.
- Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham N.C.: Duke University Press.
- Murphy, Michelle. 2013. "Chemical Infrastructures of the St. Clair River." In *Toxicants, Health and Regulation since 1945*, edited by Nathalie Jas and Soraya Boudia, 103–15. London: Pickering and Chato.
- . 2017. "What Can't a Body Do?" *Catalyst: Feminism, Theory, Technoscience* 3 (1): 1–15. <https://doi.org/10.28968/cftt.v3i1.28791>.
- Nieuwenhuis, M. 2015. "On One Breath All Depend." *Journal of Narrative Politics* 1 (12): 167–79.
- Nixon, Rob. 2006. "Slow Violence, Gender, and the Environmentalism of the Poor." *Journal of Commonwealth and Postcolonial Studies* 13 (2).
- . 2011. *Slow Violence and the Environmentalism of the Poor*. Cambridge MA: Harvard University Press.
- Petryna, Adriana. 2013. *Life Exposed: Biological Citizens after Chernobyl*. Princeton, N.J.: Princeton University Press.
- Rofel, Lisa. 2007. *Desiring China: Experiments in Neoliberalism, Sexuality, and Public Culture*. Durham NC: Duke University Press.
- Rogaski, Ruth. 2019. "Air/"Qi" Connections and China's Smog Crisis: Notes from the History of Science." *Cross-Currents: East Asian History and Culture Review (e-Journal)* 30: 55–77. <https://cross-currents.berkeley.edu/e-journal/issue-30/rogaski>.
- Sivin, Nathan. 1987. *Traditional Medicine in Contemporary China: A Partial Translation of Revised Outline of Chinese Medicine (1972): With an Introductory Study on Change in Present Day and Early Medicine*. Ann Arbor: University of Michigan.
- Sloterdijk, Peter. 2009. *Terror from the Air*. Edited by Steve Corcoran. Semiotext(e) Foreign Agents Series. Los Angeles : Cambridge, Mass.: Semiotext(e); Distributed by the MIT Press.
- Stengers, Isabelle. 2000. *The Invention of Modern Science*. Minneapolis: University of Minnesota Press.
- Stewart, Kathleen. 2011. "Atmospheric Attunements." *Environment and Planning D: Society and Space* 29 (3): 445–53.
- Svarverud, Rune. 2014. "The Terminological Battle for Air in Modern China." *Wakemon* 26: 23–44.
- TallBear, Kim. 2011. "Why Interspecies Thinking Needs Indigenous Standpoints | Society for Cultural Anthropology." *Cultural Anthropology Online*. Fieldsights, Theorizing the Contemporary. 2011. <https://culanth.org/fieldsights/why-interspecies-thinking-needs-indigenous-standpoints>.
- Taylor, Peter J., and Frederick H. Buttel. 1992. "How Do We Know We Have Global Environmental Problems? Science and the Globalization of Environmental Discourse."

- Geoforum* 23 (3): 405–16.
- Tironi, Manuel. 2015. "Disastrous Publics: Counter-Enactments in Participatory Experiments." *Science, Technology & Human Values* 40 (4): 564–87.
- Todd, Zoe. 2017. "Fish, Kin and Hope: Tending to Water Violations in Amiskwaciwâskahikan and Treaty Six Territory." *Afterall: A Journal of Art, Context and Enquiry* 43: 102–7. <https://doi.org/10.1086/692559>.
- Tronto, Joan. 1987. "Beyond Gender Difference to a Theory of Care." *Signs: Journal of Women in Culture and Society* 12 (4): 644–63.
- Wang, Shiliang, Michael J. Paul, and Mark Dredze. 2015. "Social Media as a Sensor of Air Quality and Public Response in China." *Journal of Medical Internet Research* 17 (3). <https://doi.org/10.2196/jmir.3875>.
- Warner, Michael. 2002. *Publics and Counterpublics*. Cambridge MA: MIT Press.
- Weston, Kath. 2012. "Political Ecologies of the Precarious." *Anthropological Quarterly* 85 (2): 429–55. <https://doi.org/10.1353/anq.2012.0017>.
- Xu, Janice. 2019. "Communicating the Right to Know: Social Media in the Do-It-Yourself Air Quality Testing Campaign in Chinese Cities." *International Journal of Communication [Online]* 8 (20).
- Zee, Jerry. 2015. "Breathing in the City: Beijing and the Architecture of Air." *Scapegoat* 8: 46–56. http://www.scapegoatjournal.org/docs/08/ZEE_6.pdf.
- . 2017. "Holding Patterns: Sand and Political Time at China's Desert Shores." *Cultural Anthropology* 32 (2): 215–41. <https://doi.org/10.14506/ca32.2.06>.
- Zhan, Mei. 2005. "Civet Cats, Fried Grasshoppers, and David Beckham's Pajamas: Unruly Bodies after SARS." *American Anthropologist* 107 (1): 31–42. <https://doi.org/10.1525/aa.2005.107.1.031>.
- Zhou, Zhihua. 2014. "China Launches New Urbanisation Plan (2014-2020)." *East Asian Policy* 06 (02): 5–19. <https://doi.org/10.1142/s1793930514000129>.