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Dangers in the Air: Aerosol architecture and its invisible landscapes

“As of the twentieth century, air was deliberately made into a weapon, an innovation that marked a turning point for the modern mind.”

By Javier Arbona

In the late months of 2009, researchers at the Mayo Clinic in Minneapolis validated some horrifying claims by twenty-four slaughterhouse workers from two states. The workers reported symptoms ranging from numbness to paralysis. What they all had in common was that they worked at or near the “head table” in pork processing plants where pig heads are butchered. Investigations proved that they had all inhaled a mist of pig brains that triggered an autoimmune response, causing neurological disorders. It was so disgusting that it was almost unimaginable and, in fact, was a surprise to science: “aerosolized” pig brains, the microscopic industrial byproduct of mechanically blowing out every last piece of flesh from a pig head, can

impair the motor functions of anyone who breathes it.

As of the twentieth century, air was deliberately made into a weapon, an innovation that marked a turning point for the modern mind. Or so says German philosopher Peter Sloterdijk in his book *Terror from the Air* (2009), in his discussion of German use of gas warfare during World War I. Suddenly the air itself—an invisible part of the earth's environment—could be activated, differentiated, and unleashed as a killer: an anti-air. In other words, it could be “weaponized,” a buzz- word that gained traction in 2001 when someone, likely a scientist

in a U.S. army lab who later committed suicide, killed five people with anthrax that became airborne in the slight draft when the victims opened envelopes sent through the mail. As architecture theorist Enrique Ramírez has noted on his site aggregat456.com, the 1995 sarin gas attacks by the Aum Shinrikyo cult on the Tokyo subway, much like the anthrax scare, also shared a certain commonality with the use of poison gas in the wars of the past hundred years: taking advantage of the diffusing properties of common air, the attackers used the system that normally delivers the oxygen our bodies need and turned it into an instrument to kill.

For the past couple of decades, to name another kind of macabre air incident, the U.S. military has also been contaminating otherwise breathable air by shooting uranium-tipped bullets on various fronts (and this is in addition to other forms of weaponized air, as with napalm). The depleted uranium bullets become extremely hot when they are fired, which enables them to pierce the thick steel armor of tanks. They have been used in battlefields from Kosovo to Baghdad, and also on U.S. bases such as the former military practice range on Vieques, Puerto Rico. They leave an invisible plume in their wake, polluting and causing cancer among populations that have nothing to do with the military maneuvers, yet are affected through the common medium of air.

But the incident of the aerosolized pig brains, in part because it received some news coverage, could help to mark a new turn in air design. Far from being harmed by a deadly agent like sarin gas or uranium, the workers were harmed—indeed, physically incapacitated— by a substance that diffused into the air in their work environment, air that in the normal course of events *they were expected to breathe*. Of course, this wasn't exactly new. Since the Industrial Revolution, mineral extraction firms, factories, energy monopolies, airlines and cars have permanently altered the human daily air intake by aerosolizing unprecedented amounts of ancient elements once locked in the Earth's core.

AIR IN ART AND ARCHITECTURE

In the history of art, the aerosolized pig brains incident might find its place as the shock that made us pause and consider the materiality of air, how we have underestimated what air's presence does to us, and the potential side effects of our inattention. In the hands of certain artists and architects, the many qualities of air are being rethought.

In the hands of these artists, air is a variety of particles—design components, really—that can be manipulated into various textures, surfaces, and spaces. At the same time, they are transforming the scales at which architects typically work, leaving behind their most cherished and standard building sizes and usual notions of urban spaces. And they are bringing the multiple temporalities of air into play through designs that actually collect many airs from different times.

This new mentality could lead to a reformed public architecture that seizes air back from those who've controlled it, long disregarding the health of air's inhabitants. The designers who have begun this reclamation project use whimsical strategies, experimenting with tints, adhesives, odors, vapors, and airborne media to harness the latent architectural possibilities in our atmospheres.

Madrid architect Nerea Calvillo refers to urban air as “invisible layers that also are landscapes.” Her project, plainly titled *In the Air*, began in 2008 when Calvillo and a multidisciplinary team of colleagues participated in a workshop investigating “visualizations” of the less apparent geographies of cities. *In the Air* aimed “to make visible the microscopic and invisible agents of Madrid’s air.”

Visualization, a recent obsession in design and architecture, has been unlocked by widespread, inexpensive new technologies—like mobile computing and mapping mashups—for data collection and representation.

Calvillo’s team has gone boldly into this visualization territory by making a mechanical prototype of, in effect, an atmosphere, which they call a “diffuse façade.” To test the idea, the team mixed bright, organic tints with water vapors and released them into Madrid’s air. Part of the concept, as the project continues, is to demonstrate that the changing colors of these fogs can operate as an index that reveals the actual particulate content of the air. Thus, everyday air, rendered visible, can show citizens what they are breathing all the time. The atmospheres can also become parts of a building, harnessing Calvillo’s “invisible layers” to provide clear evidence of commonly unknown dimensions of the environment.

One problem, however, with visualization as this generating mechanism for form, is that it quickly becomes confusing, a sea of information that a viewer can’t sort through. The aesthetics can be beautiful, but the spectacle is just that: a razzle-dazzle data performance sans political teeth. Visualization has also been fetishized by many architects and information designers as objective and neutral— but it is not. Information that unexpectedly becomes visible is no less political, infused as it is with the ways in which it was gathered or rigged, not to mention the motives that might lie behind its dissemination. Its persuasive capabilities can be elusive as well as treacherous. But Calvillo sees the potential to help activists by creating a political instrument able to verify or disprove air quality claims made by governments or corporate polluters.

As purely architectural spaces of uncertain shape, the clouds that Calvillo produced bring to mind several other architecture experiments, most famously the *Blur* pavilion for the sixth Swiss national exposition by Elizabeth Diller and Ricardo Scofidio (2002). The objective of that project was to make a building that challenged the materiality associated with conventional buildings. They did this by using a misting-nozzle system that contingently responded to atmospheric conditions, changing as often as the atmosphere changed. All in all, it was a temporary building, which the architects hoped would force the audience to think of all buildings in a less certain way, perhaps in a more unformed and dematerialized way, as all things under contemporary capitalism potentially are. But *Blur* still worked closely within the architectural tradition of the building as a unit within a certain scale that architects are able to produce in their offices and technically manage. *Blur* also used air as a monolithic unit, in contrast to the manifold “invisible layers” treated in Calvillo’s *In the Air*.

Another example of a building as response to its air environment is *B_mu*, or *Bangkok museum*, a design created by a firm with the cryptic moniker R&Sie(n). *B_mu* was never built, but the proposal’s radical conception achieved a kind of cult status among architects. *B_mu* wrapped a conventional stack of rectilinear gallery rooms in a drooping shroud, a kind of skin. The surface of the draped shroud was to be coated in an electrostatic material that would capture particles from the polluted air of the city, the way a computer monitor attracts dust to its surface. The project drew inspiration from Man Ray’s 1920 *Dust Breeding* (Duchamp’s *Large Glass with Dust Notes*), a long-exposure photograph of dust collecting on a Duchamp work. As time passed, little by little, the building would become fuzzy and sooty.

R&Sie(n) wanted to materially harvest the air itself. However, as in the case of *Blur*, the program, organization, scale, and even the social meaning of the pollution itself remained unaltered and conventional. Though closer to the dust, viewers are no less politically alienated from the complex network of relations that enabled the pollution in the first place—most notably because visitors would have remained

cocooned in the controlled-air environment of modern art display. Perhaps a kind of coy trick was to be played on museum visitors, the very subjects of the museum's critique, one could surmise.

NEW AIRSCAPES

In light of the immense social possibilities of *In the Air*, making objects at standardized scales (*Blur*) and reinventing the architectural surface (*B_mu*) now both seem to belong to a past era in air design. Calvillo's generative designs open up something new, allowing users to "make" new atmospheres based on various personal or group agendas. Her sights are set on transforming the smallest pieces of architectural form. We are most often unaware of them, but these are everywhere. She calls them the "microscopic agents that are with us." Calvillo, her collaborators, and like-minded producers are intent on manipulating the manifold quality of air itself.

Architectural historian David Gissen has written brilliantly about the challenge of using and, especially, avoiding one type of air: smoke (most recently in *Subnature*, 2009). He has speculated about reconstructing the historical air above Pittsburgh. Here the filthy industrial past that is often forgotten, as cities create sanitized paeans to the past, would return in the form of a stratum of archivally accurate smoke. With no illusions of actually accomplishing his idea, Gissen proposed to recreate the mantle of sooty and dirty air that hung over a quadrant of the early twentieth-century city. This was meant as a provocation and a critique of the selective bourgeois tastes of the historical preservation discipline, not to mention the scales of building that are conventionally chosen for preservation.

Another experimentalist historian and architect, Jorge Otero-Pailos suggests, inversely, that it is also important to extend the boundaries of architectural preservation to embrace a smaller scale. Along these lines, he has proposed to recreate the smells of cologne and tobacco smoke in the air of the landmarked Philip Johnson Glass House in New Canaan, Connecticut, where extended salons used to take place with the likes of smokers such as Andy Warhol.

Gissen and Otero-Pailos's speculative installations capture something else that Calvillo had mentioned: we often experience the simultaneous presentation of disparate aspects of the environmental past in one place. Even when we feel that we are just breathing basic air, and are as "in the moment" as can be, we are actually inhaling a mosaic of airs that originated not just in various places, but at various historical times as well. *In the Air* extrapolates a dreamy urbanism where this mosaic becomes a real vision, and one can move through fogs of various colors, or even of different smells and perhaps of inebriants that, like Proust's scent of a madeleine dipped in tea, transport us to other mental places. (To a similar end, Bompas & Parr, architect-producers of what could only be described as *à la carte* happenings, made a cloud of breathable gin-and-tonics for a gallery in April of 2009).

The creators of *In the Air* imagine a future time when, according to their website:

Assembly instructions will be posted on the web and each user will be able to make a unit for their balconies or windows. This will generate a distributed net of visualizations, representing the data collected throughout the city. An individual can "tune" their unit to select the pollutant they are interested in tracking—this will allow for the construction of a collective map of personal environmental interests.

Many claims and assertions are made about ecology and clean air. What if, as this text suggests, we could suspend a plume of tinted air, using data from even four or five years ago, and evaluate it next to a present one? Has the air improved, or not? Is the particle density greater or lesser? Using the *In the Air* instruction manual, perhaps one could single out the air made by a polluter, and even re-situate it or blow it into a

different location—a gallery perhaps, or towards the polluter’s corporate offices. One could colorize the pollutants that hover over a prohibited landscape, like that depleted uranium cloud over the closed Vieques “wilderness refuge” (a clever U.S. government ruse for evading remediation of a Superfund site), so that it could be seen by civilians from afar. This could take air beyond neutral data and into the realm of political contestation, activating streets and public spaces. But all of this will only be possible once the idea of air is freed from mono- lithic scale, singular time, and notions that fix air as static object.

GOOD AND BAD AIR

In *Subnature*, Gissen writes that the history of architectural theory offers fleeting glimpses of the problem of vapors and dirty air, usually in discussions of chimneys, vents, and other building forms meant to exhaust smoke from spaces, while retaining the heat and the social pleasure of a fire in the hearth. Smoke that contaminates homes, work- places or entire cities has, after all, often signified urban dysfunction, lack of progress (or, conversely, modernity) and ill-health. Think of the gritty images that Ridley Scott created for *Blade Runner*, or even the hysterical media reports about the polluted air of China’s cities.

Today we are talking about ever more technologically advanced techniques for “carbon capture,” “sequestering” and then locking away fly ash in concrete for roads and buildings. These steps serve to minimize harmful emissions, and also offer a psychological palliative that that out of sight can comfortably mean out of mind. In comparison, the projects envisioned by Calvillo, Gissen, Otero-Pailos, and others have the opposite aim: questionable air is to be retained and made visible, and its political meaning manifested for more people to experience.

In other contexts, vapors, mists, and clouds are seen as alluring and mysterious, or perhaps edgy and decadent. The smoke that pervades music videos, night clubs, and rock concerts is a bit of safe danger in a controlled place. This is also a type of air use, by the way, that confounds theorists and architects, because it usually pertains to entertainment, perceived as a lowly terrain for “serious” designers. Calvillo’s *In the Air* plays with the duality of dirty air that is also made beautiful and dream-like; her major challenge is how to make air-in- motion apparent—those invisible landscapes she speaks of—while taking care not to fall into mere theatrical cliché.

The lighting and smoke effects used by some artists may seem like spectacle, but can also open up new aesthetic and social territories. This ambiguity is illustrated in the works of HeHe (Helen Evans and Heiko Hansen), which condemn polluted air while at the same time focusing sympathetically on the role of desire and human agency in pollution (a lamp that changes colors around smokers, for example).

They call their collected cloud projects “Pollstream” (See hehe.org, free.fr). These have provocatively taken shape at a variety of scales and locations, remitting us back to the earlier discussion, but in general, like Calvillo, they use colors as indexes of the combined effects of social activity and pollution. One of their most famous works, *Nuage Vert*, reprised several times in various cities, is a spectacular laser projection that traces the ghostly outlines of a plume of industrial smoke in the dark of night.

Nuage Vert’s creators write on their website of the ambiguity they wanted to convey. On the one hand, the visual aestheticizes the un- healthy products of energy consumption, changing as it does according to fluctuating energy data. Here, art displays to the public an unusually enthralling and surprising object, very different from what is ordinarily visible in the night sky, capturing the imprecise cloud shape of the plume. Consumers themselves, however, remain in the background, with the same incapacity to collectively organize in order to change their environment that they had before seeing this heavenly revelation against the dark sky. It must be noted, though, that the lengthy process of receiving permission as well as popular support for the project involved lengthy meetings and discussions with various stakeholders, a less visible

though equally significant part of the work. By reverting to overly generalized notions of monolithic air and society, the art proselytizes like a fresco in church. Afterwards, life goes on.

In another project called *Toy Emissions*, HeHe use a radio-controlled miniature model of a luxury sport utility vehicle that emits colorful fumes out of its tailpipe. As it weaves through traffic in a crowded Manhattan intersection, the playful, surprising, and rather hokey little vehicle engages its audience. There is no guarantee that *Toy Emissions* will spur anyone to modify their car addiction or their energy consumption, but it does delight the crowd, which roars its approval; a small moment of collective identity is created. If *In the Air* showed us a new model of diffused urbanism, *Toy Emissions* presents an overlooked scale of activity and event-making that most architects would be reluctant to undertake, possibly because they simply don't recognize its potential, or because their clients usually do not solicit that kind of work.

ELEMENTARY PARTICLES

The smaller scale, a contingent and changing category that entirely depends on the relationship of entities within a larger context, is rich in possibilities. Small doesn't have to mean microscopic or even very tiny. In such kinds of work, designers can succeed by displaying "small" thinking as a multiplier; that is, by thinking in multiples of particles and their social distribution instead of creating single, monumental objects beyond the reach of individual human agency. The small scale can be stealthy; it can be strategic; it can evade capture.

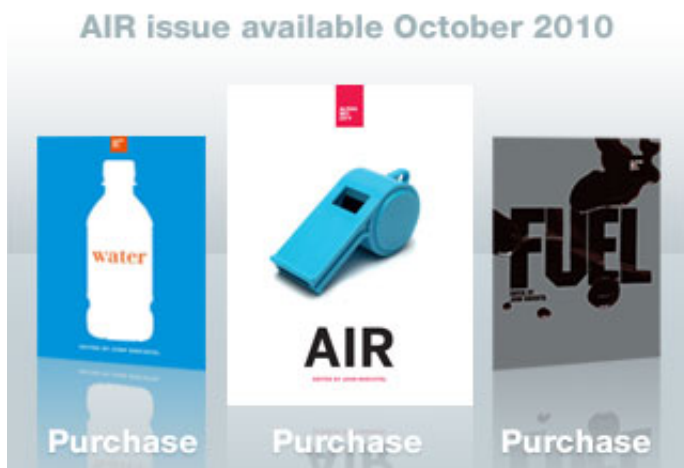
Finally, liberated air can itself be recaptured. Think of a kite, an object that to be successful must accurately embody the properties of wind as a changing force, and can demonstrate the complexity of air in motion in structural terms. Yet a kite is a small, portable object— one that I propose we take with us everywhere, not as a real object, but as a cognitive metaphor for finding ingenious ways to reclaim air. Most of the projects I have described here operate at spatial scales that are charged with opportunities for lateral movement, site occupation, or political revelations from vantage points usually discarded by hegemonic powers. What these projects ultimately suggest is that the air around us is responsive to our collective human actions. It can be changed, gathered, relocated, and molded to inspire new forms of dwelling, sociability, and community.

Image: Elizabeth Diller and Ricardo Scofidio, Blur pavilion for the 87 sixth Swiss national exposition, Yverdon-Les-Bains (2002)

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