Air Mexico

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Abstract

Despite its close proximity to the United States, the arrival and consolidation of an ecological movement in Mexico follows a distinct pattern of development. Several asymmetries divide the Mexican and American histories, even as a constant interchange of atmospheres and airborne pollutants erodes the demarcation of national boundaries.

Conceived against a background of several such significant asymmetries and exchanges, our contribution to the working group publication will consist of two components – written and visual – that aim to describe the recent history of smog, air and atmosphere in Mexico City. The primary conceptual objective for the project will be to trace and analyze through various forms of depiction and representation, through various smog events, and in relation to a range of science practices, how air becomes established as a culturally produced object. Simultaneously, our research will follow how smog begins to cohere as an object of discourse and becomes visible, not only to occupants of Mexico City, but also to architecture more generally as the principle component of what might be identified as an emerging "smog urbanism."

This condensed history of air and smog in Mexico City will be narrated around key episodes, from the 19th discourse on Mexican modernization and sanitation to more recent examples of diseased air and anxieties around contagion and air transmissibility. Among these episodes, those of 1968, the year of the Mexico City Olympics and the protest events at Tlatelolco - the massive urban housing centerpiece designed by architect Mario Pani - will be given priority. 1968 delivered an intense study of the potential hazards of "thin air" by city officials, international Olympic advisors, and local architects. Through this inquiry the question of air and performance became associated with this widely televised and photographed stage of Mexican modernity, delivering a new image of national atmospherics that ultimately led to consideration of a more dystopian climactic condition, including both the densely increasing accumulations of pollutants and the proliferating clouds of tear gas.

The poets of yesterday and today cry out; the fathers, the mothers, the brothers, the girlfriends cry without being able to do anything. What does it matter. The Tecatecuhtli said he would arrive where he needed to go; he arrived.[1] The Tecatecuhtli will retire to a mansion that cost the country more than forty million pesos, with air filtering apparatuses against the smog (and the vapor of spilled blood? And the smoke of the rifle shots? And the clouds of tear gas?), with a private cinema, with a solid gold bathtub and marble walls without impurities, like mirrors. The better to admire himself. "Everything is possible in peace." "One road: Mexico and the Mexican Revolution."

Carlos Fuentes, "La disuntiva mexicana" [The Mexican Dilemma], *Tiempo Mexicano* (Mexico City: Joaquín Mortiz, 1971) 154

Fuentes, writing from Paris in 1968, makes the connection for us; Mexican president Gustavo Díaz Ordaz' smog-proof mansion here is an emblem of supreme disconnection from the city, a hygienic compartment free of industrial particulates and tear gas. Mexico City was by the 1960s a familiar image of explosive urban expansion, gigantic population, and a certain air of promise and increasing economic power. The last player in this account is the city's famously polluted air. The capital's sky is seemingly everywhere in the late 1960s, filled with parade confetti over John F. Kennedy's convertible limousine during his June 1962 visit, above Mario Pani's newly-completed Nonoalco-Tlatelolco housing complex (1962-64), traversing the ventilation ductwork of the city's prismatic high-rises, and entering the lungs of athletes at the 1968 Olympics. As it passes through these bodies and spaces, the city's air also passes through the Functionalist *licht und luft* priorities of architects such as Alvaro Aburto, Juan Legarreta, and Juan O'Gorman; it is measured by atmospheric chemists at the National Autonomous University of Mexico (UNAM) and registered by physiologists who accompany the Olympic athletes.

We track the Olympic process from award in 1963 over competitors Detroit, Lyon, and Buenos Aires to the commencement on October 12, 1968. The Olympic graphic branding appears at all scales and with increasing urgency as commencement approaches. This choreographed image of Mexican modernization culminates in the televisual image; Mexico City's Olympics were the first in which color images of ceremonies were broadcast internationally. The image of the city, shown on telecasts and network news, replaces those of government repression, only ten days past, with placid and telegenic views of the Olympic venues. Participating through air waves and air space, Mexico City conjures a moment of unavoidable attraction—radiating lines of pink and orange from the Olympic Stadium supergraphic, the capital becomes a city televised from the air in a narrative of Mexican ascendancy.

Smog Urbanism

The Olympic broadcasts also depicted the atmospheric unconscious of Mexico's escalation. Behind the logo sculptures, around the floating inflated Olympic rings and as omnipresent background to the footage of new Olympic buildings, Mexico City's photochemical sky invaded the image. Within a history of Mexican air, the potency of Mexico City 1960's pollution is remarkable. In photographs and other documentation it is evident that by 1968 Mexico had become accustomed to an aerial condition of intense smog urbanism.

Yet, equally remarkable, Olympic broadcast commentary rarely mentions the atmosphere. The simultaneous hyper-visibility of the polluted air and the seeming absence of its observation and description repeats a mode of perception common to the city's politicians, much of its population, and its architects. Indeed, systematic measurement of the city's atmosphere was not initiated until the 1970's.

One of the more methodical studies of the modernizing city was an ongoing aerial photographic record constructed from 1930 onwards. Now housed by the ICA (Ingenieros Civiles Asociados, Association of Civil Engineers) archive, these images record every major construction project in the city during the decades of the city's headlong midcentury industrialization. Repeating the architectural obsession with construction armature, the archive is a self-portrait of modern Mexico City under construction.

[1] In the Aztec social structure, the term Tecatecuhtli designated a supreme spiritual and military authority, the "Chief of Men." Under early phases of Spanish rule the term was retained to designate the colonial ruler over Tenochtitlán.

These images record the increasing deployment of steel skeletons and glazed curtain walls in large scale construction across the city; they are not only taken from the air, but in another sense, record the city's background, visible through the steel frames and over the construction sites. The buildings are often arrested before envelopes and perimeters are installed, and the photographs reveal the atmospheric background against which a building will seal itself. In a pairing that appears in modernisms elsewhere, the buildings become filtering mechanisms that invest themselves in modernist visual transparency even as they produce an atmospheric opacity.

The curtain wall, of course, is a primary strategy by which modernism dissolves the structural perimeter and decorative surface. As Mexico City industrializes, the components that constitute this thin perimeter are increasingly degraded and dissolved.

The link between modernist architecture and Mexico's development in an international economic context can be understood, then to play out across these vertical surfaces and sealed envelopes. The air over the basin receives the aerosol ingredients of the city's expansion: concrete dust, asphalt, carbon monoxide, sulphur dioxide, lead, and later, ozone and more contemporary mixtures of volatile organic compounds. The result is a constructed atmosphere whose ingredients and particulate hazes are contingent on the city's expansion and numerous construction projects.

Colonial Dust

If the aerial mixture over the city corresponds to historical patterns of development, industrial expansion, and metropolitan sprawl, it also contains mineral dust, an admixture that emerges from the city's construction as a colonial capital. If the presence of ozone, for example, is directly linked to the internal combustion engine and industrial exhaust, this dust may be traced to desiccated alkaline land on the city edges and to the immense colonial effort to drain Lake Texcoco. The ubiquitous dust of Mexico City, then, emerges not only from the combination of prevailing winds and exposed soil; its haze is an inscription in the atmosphere, inseparable from the city's history and national mythology.

Even a brief account of modern architecture's preoccupation with environment (in Mexico and elsewhere) must make reference to the relationship between hygiene and air cleansing. If the identity of a nineteenth-century industrialized metropolis is inseparable from its atmosphere of dust and smoke, the countersign produced by early twentieth-century modern architecture was the hygienic interior. Indeed, modern architecture's air handling equipment, which underwent increasing articulation in subsequent decades, was seemingly deployed to articulate this dialectic, constructing the atmosphere of a modern city, interior by interior. This is doubly curious considering modernism's parallel investment in thinning and dissolving its own perimeter. Thus, even as space purportedly flowed freely from the architecture into its surroundings, the building increasingly sealed itself against the dust and particulates of the modern metropolis.

We can examine the historical artifact of Mexico City air, with its aerosols, hazes, refractions and occlusions, against modern architecture's air filters and universalizing ethos. In the years leading up to 1324 the Valley of Mexico was a network of Olmec settlements around the saline waters of Lake Texcoco and its smaller companions. The monumental urban nucleus of Tenochtitlán, constructed after Aztec settlement, was serviced by freshwater aqueducts and a system of dikes to regulate the city's water level. With the imposition of Spanish rule in 1521, large parts of the lake city were destroyed and reorganized to follow the Spanish charter, a code that was itself informed by Albertian urbanist principles. The Spanish, whose forces destroyed the dikes and canal system when they laid siege to Tenochtitlán, would later make numerous unsuccessful attempts to regulate the city's water level. The city the German explorer Alexander von Humboldt had called the "Venice of the New World" was transformed into a monumental engineering project as the Spanish attempted to drain water from the expanding colonialist base. The floods began in 1604, and were followed by increasingly destructive inundations in 1607 and 1629; they would continue as a sequence of projects failed to produce an equilibrium between the city and the network of lakes.

With the construction of interlinked tunnel and canal projects in the eighteenth century, areas of land emerged from the shrinking lake and portions of the valleys became semi-arid. The city suffered, paradoxically, from a

chronic water shortage and sinking ground at the city center.[2] As a direct result of the drainage, the dry lakebed exposed an increasingly large alkaline surface. While the soil proved too saline for cultivation, it often yielded "tolvaneras," clouds of particulate blown aloft that remain suspended above the city.

The migration of these particulates into the Mexico City air, then, is a repeating event whose inception predates the city's mid-Twentieth Century industrialization. The familiar haze and color of the city's sky is partly attributable to the effects of these colonial engineering projects. These projects were themselves motivated by at least two desires: first, to obliterate the Aztec metropolis and construct a colonial capital on a renaissance model; second, to mitigate anxiety over the supposed effects of still water, miasma and disease. Mexico City's dust emerges as a colonial side effect that predates and accompanies the city's expansion to its present size. The mineral particulate haze hung over the 1810 War of Independence and the 1910 Revolution; it is in the sky over Tlateloco in October 1968, and remains suspended above in the present moment. This Mexican haze not only persists as the city expands; at present it contributes to the city's photochemical smog.

The dust and haze above the city had been present long enough that it became not only ubiquitous, but naturalized. As the city added infrastructure and accelerated its industrialization in the 1940s, the country opened itself to foreign investment and Mexico City's air was injected with the airborne materials of mid-century industry and transport. In this moment of private investment and urban construction, the haze both reduced visibility and disguised the newer aerosol wastes injected into it.

This was precisely the atmospheric composition against which the Post War high-rise would seal itself. The Mexican curtain wall formed the barrier between International Style and local particulate. The city's modernization, further, was scoured by alkaline particulate that did not exist in transhistorical suspension; the atmosphere of Mexico City, rather, is a historical artifact whose traces are registered in the instruments of atmospheric chemistry and the bureaucracy of metropolitan air sampling. If modernist air management attempted to produce an optical transparency as it constructed an environmental opacity, the city's particulate eroded both components of this pairing. The city's airborne dust, occluding vision, resisted architecture's strategies of transparency; adhering to the building envelope and drawn into ventilation supply ducts, the cloud overwhelmed architecture's filtering mechanism.

Historical accounts describe the sometimes-unstable construction of modernist ideology in Latin America. There were numerous debates among Mexican architects about its deployment in the city.[3] In these discussions, the relationship of a Mexican architecture with internationalism was one of the main points of contention; articulations of this issue tended to imagine ways in which "local" aesthetics could "inflect" international architectural production. While modernism would frequently understand these techniques as a species of local admixture, in Mexico this debate is imbricated into the discourse of "plastic integration." In this scenario, the concept of a unity of the arts is appropriated to "integrate" local modes of production with European-derived architectural internationalism.[4]

The perception that the air is full of naturalized haze is symptomatic of other misreadings of Mexico City's air. The idea of plastic integration can be read less as an appropriation of modernist tactics than an obsession with the relationship between modernism and localized exterior surfaces (through the application of murals, tilework, and bas-relief monumental sculpture). Even as the ambition of plastic integration gathers force, the real conditions of the city's haze occlude the architecture's integrated surfaces.

[2] For an account of the various projects intended to manage and eventually drain Lake Texcoco, see Ernesto Aréchiga Córdoba, "El Desagüe del Valle de México, Siglos XVI-XXI: Una Historia Paradójica," in *Arqueología Mexicana*, Jul.-Aug., Vol. 12 Issue 68, 60-65.
[3] For several key documents in this discussion, see "Pláticas Sobre Arquitectura: México, 1933" in *Raíces: documentos para la historia de la arquitectura mexicana*, reprint of the 1934 edition (Mexico City: UNAM, 2001).
[4] A list of large-scale projects to emerge from *integración plástica* would include the Chrysler factory designed by the team of Rosell de la Lama, Lorenzo Carrasco, David A. Siquieros and Leopoldo Méndez (1952) and perhaps most famously, Juan O'Gorman's murals and design for the Central Library at UNAM (1954).

Refraction

While air pollution monitoring in Mexico City began in the late 1950s, efforts were sporadic and increasingly hampered by industrial interests and denials of government funding. While the next decades would yield fragmentary samples and studies, the archive of airborne particulate and aerosols before 1970, during this time of the city's extraordinary expansion, is largely absent.[5] The occlusion produced by the city's dust is perhaps matched by the Mexican government's acquiescence to industrial interests and misapplication of measurement techniques by many of the scientists who did attempt to sample the air.[6]

Thin Air

Of all forms of atmospheric refraction [and episodes of misconstrual] that occurred through the 1960's, arguably the most consequential and paradoxical took place during the period leading up to the 1968 Olympic games. After the International Olympic Committee (IOC) awarded Mexico the games in 1964, a prevalent interpretation emerged of a developing nation elevated to membership in an elite association of advanced industrial nations. Simultaneously, anxieties about this elevation played out in several directions.

International concerns about the physiological effects of Mexico City's high altitude led to a condition that the IOC would eventually identify as "altitude psychosis."[7] Within Mexico, a more sanguine response to the city's altitude prevailed, though the expectation of economic elevation and a narrative of national ascension governed Olympic preparations. Following questions of atmospheric health that had circulated through late nineteenth-century Mexico, demonstrations of sanitation and hygiene were routinely offered as evidence of the country's emerging modernization. Yet by the 1960's, the narrative of ever-increasing modernization, seen in urban growth, new construction methods, and technological expertise would be relocated from atmosphere to administration, and to the ability to successfully manage the Olympics and escalate the modernization of Mexico through a more expansive building program.

If Mexican Olympic architecture was burdened with the demands of national elevation, consternation over the height of Mexico City's plateau compelled the IOC and other participating Olympic nations to conduct a series of scientific studies. The city became a site of atmospheric testing to measure and evaluate the effects of Mexico's "thin air" on athletic bodies and their performance. Mexico City's altitude was figured both as a technical problem and a threat. Physiologists, concerned with the rate of athletes' environmental adaptation, worried that sudden exposure to this thin air, coupled with strenuous activity, would endanger the athletes' lives.

A database of oxygenation was compiled. The French Olympic delegation collected data on the respiratory behavior and oxygen concentration of Bolivian miners and added to results from the Mexico City tests. Despite repetition in IOC literature, scientific papers, and the popular press, anxieties around thin air eventually dissipated, only to be replaced by speculation on the effects of the increasing concentration of athletic performance testing. The conception of the athlete as nothing more than a breathing apparatus optimized by calibrated exposure to elevational differences and to oxygen intake began to haunt the Olympics and Mexico City. The notion of a "laboratory champion" controlled remotely by test results circulated within the IOC.[8]

This symptomatic concern over testing procedures and the excessive scrutiny of air and atmosphere would undergo a further displacement. The IOC soon focused on the complication of altitude in relation to doping and the use of the performance-enhancing drugs. If the "laboratory champion" was understood to be antithetical to the spirit of athleticism, the danger of impurities in the athlete's blood (another laboratory fabrication) was exposed as an even greater threat to the Olympic ethos. The IOC, assisted by various testing organizations, asserted that doping would have lethal effects at higher elevations.

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[5] Qing Wen Tian and Peter Brimblecombe, "Managing Air in Olympic Cities," *American Journal of Environmental Sciences* 4 (5): 439-444, 2008, 440.
[6] Interview with Dr. Humberto Bravo Alvarez, Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México (UNAM), July 2009.
[7] Comite International Olympique, *Newsletter* No. 2, November 1967, 12.
[8] Comité International Olympique, *Newsletter* No. 2, November 1967, 10.

From thin air to doping, and through this series of air alarms, the question of Mexico City's altitude exacerbated anxieties around the Olympics, and, arguably, around the country's international ascension. The displacement of these anxieties onto the altitude and the atmosphere by the IOC and other observers, further, produced a curious cross registration of Mexico City's absent atmospheric record. The athlete's bodies served as surfaces of atmospheric inscription, as sites of oxygen crises and as concentrations of contaminants. Through the production of the athlete's body as sensitive recording mechanism and as target of empirical observation, Mexico City's Olympics and its air pollution were bound together in at least two ways. First, the athletic body would become the supplement to the absent archive; second, both the Olympics and air pollution would be understood as inevitable byproducts of a national modernizing telos.

Because of (or despite) this Olympic coupling, the attention to thin air, the increased scrutiny of physiology and air conditions becomes increasingly uncanny in relation to the ongoing misconstrual of Mexico's air pollution. If not entirely invisible to the visiting delegations and the IOC, the city's polluted air was viewed as unremarkable. Its urban haze was noted but dismissed as "unfortunately experienced by every modern town."[9] This familiar pollution was seemingly understood as the cost of Mexico's ascent into advanced industrialization. Repeating similar occlusions and refractions, the city's airborne contaminants were barely noteworthy; the haze over the modern city was already ubiquitous, while the thinness of the air, largely chimerical, produced years of intensive examination.

Tear Gas, October 2 1968

Another more familiar Olympic coupling links the games with the infamous massacre at Tlatelolco. On October 2 1968, 10 days before the opening of the games, following months of marches, demonstrations and political tension, students and other protestors gathered in the Plaza las Tres Culturas found themselves surrounded by Mexican police and army troops, tanks, helicopters and marksmen. Tear gas and grenades were launched, guns were fired, protestors were pursued, stabbed with bayonets and arrested. Many were killed, hundreds injured, thousands arrested.

While the massacre and earlier student protests are commonly positioned as the result of the Olympics, in advance of the games, the terms of this causality have been elusive. The relationship is read across a range of coordinated events and effects: the temporal proximity to the Olympic opening; the pre-Olympic repression by the federal riot police; the violation of the autonomous space of the university; the involvement of the CIA; the necessity of an image of political stability; and the accident of the 1968 date of the Olympics intersecting international 1968 student movements elsewhere.

The indeterminacy of this relationship belongs to a general ambiguity and confusion around the Tlatelolco massacre. Descriptions by protestors list the sound of bullets, the haze of the tear gas, the smoke from shots, and the air beaten by helicopters. Despite attempts at clarification–Raúl Álvarez Garin and others present at the massacre recorded the sound of gunshots and their duration to arrive at an estimate of seventy thousand rounds fired–the disorientation of the violence and the atmospheric disorientation have collaborated in obscuring the events and their political motivation.[10]

Yet, within the development and production of Mexican air as a type of cultural object the conversion of the Olympic anxiety around thin air to the terror of the thick air of Tlatelolco is remarkable and seemingly more direct. This was not only an accidental conjunction of air episodes, but also a peculiar inversion of the biopolitical control and instrumentalization of the athletic test body in relation to air and oxygen deprivation. At Tlatelolco the tear gas targeted the respiratory apparatus of bodies as an initial assault; cloud first, bullets after. In this sense, the localized gas and haze of the attack, at once obscuring and facilitating the violence of the event, was a militarization of air and atmosphere.[11] Moreover, the attack reproduced and transformed the concern over the potentially lethal effects of thin air. It delivered a curious and sinister coda to the Olympic investment in the problems of altitude and the potential disorientation of Mexico's atmosphere.

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[9] Comité International Olympique, "The Effects of the Altitude in Mexico," Bulletin du Comité International Olympique No. 93, February 1966, 82.

[10] Holzfeind, Heidrun. *Mexico 68/CU* (Baden: Kodoji P, 2009)

[11] This formulation is described at length as "atmoterrorism" by Peter Sloterdijk in his *Terror from the Air* (Los Angeles: Semiotext(e), 2007).

Thin air: 1968 Olympics in Mexico City

Thick air: Tlatelolco massacre

Equal to the disorientation of the atmospheric event is the peculiarity of location. The Plaza de las Tres Culturas, designed by the then omnipresent architect Mario Pani, was the centerpiece of the Nonoalco-Tlatelolco housing development. Built between 1962 and 1964 its site results from a slum clearance project. The project contains 102 building and 2000 units distributed over eight building types that correspond to

resident income levels. The massive scale of the project, the emphatic modernism of its expression and organization, and the populism of its public housing contributed to its identity and deployment as symbol of national advancement. Yet, because the plaza incorporates the Franciscan church of Santiago Tlatelolco and ruins of the ancient Tlatelolco city this advancement is inflected toward an idea of historical resolution and reconciliation.

Tlatelolco and the plaza became showpieces for the Mexican government in the 1960's, and were repeatedly offered as evidence of post war modernization. When the Kennedys' visited Mexico in 1962 they were led to the site, still under construction. In a very conventional sense, the plaza and the project were positioned as a staging ground and as backdrop for political spectacles. While the certainty of this spectacle function and national identity were considered by the protestors on October 2nd, a perception of the symbolic force of the site was evidently and oddly absent from the decision to suppress the protest.

The reading of the plaza as a tactical location rather than as national symbol seems to have prevailed. Surrounding low-rise apartments were used as vantage points for the snipers that fired on the protest. The inevitable architectural outcome, beyond all trauma and tragedy, was the instant recoding of its strict modernism as sign of repression and authoritarian identity.

The Mexican curtain wall that had served as atmospheric barrier also came under assault at Tlatelolco. While its ambition had been to isolate a space free of dust and to declare an interior atmospheric isolation, at Tlatelolco curtain walls were pierced by bullets, punctured and lost in a cloud of gas and perceptual confusion. The clarity of atmospheric separation was not the only architectural victim of the attack. Amid the aftermath of Mexico 1968 Mario Pani's previously unquestionable authority soon declined. Indeed, arguably, with Olympics not yet begun, the authority of this era's Mexican Modernism and a coordination of its atmospheric logic began to unfold.

Following Fuentes, then, we can read the air-conditioned insularity of Díaz Ordaz' house as a space cleansed not only of photochemical smog and alkaline particulate, but also of accusation and indictment. Seen in the low-resolution color images of the Olympic telecast, and full of both contemporary and historical pollutants, the city's air is briefly cleansed by the uncertain weather over the October 12, 1968 opening ceremonies. The showers of two weeks past would be displaced by the fair weather forecast that coincided with the Olympics, a temporary meteorological condition that would soon yield to the air's volatile mixture of Mexican particulate and variable visibility.