4 Atmospheres of Communication

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'Active Air'

From the Wireless Fields of Poldhu in Cornwall, to Signal Hill in St John's, Newfoundland, the first transatlantic wireless telegraph transmission took place from a temporary fan aerial to a distant kite. Guglielmo Marconi had boarded a ship to Canada in the middle of the winter to receive the invisible transmission of three telegraphic dots that formed one letter: *S*. After several failed attempts, Marconi declared the transmission successful on 12 December 1901, even as detractors suggested he was simply diving the static. Crackling and popping through the atmosphere, and travelling thousands of miles from their source, the dots were scarcely audible. Yet this faint detection proved that wireless waves could both travel without cables and also issue beyond the curvature of the Earth.[1] 'Dot … dot … dot' then arrived as a curious precipitation, signalling not just the extended distance over which messages could travel, but also new formations in the atmosphere of communications.

Marconi's experimental broadcasts (together with numerous other developments in wireless taking place at the time)[2] contributed to the rapid ascendancy of wireless transmissions. Yet the wireless waves that ping across the electromagnetic spectrum also require distinct apparatuses for their transmission and reception: telegraphs, radios, televisions, telexes, radars, satellites, mobile phones, and wireless computer networks. While these devices are often considered the 'medium' of wireless (with the radio set referred to as the 'wireless' for some time), in fact wireless is the mode of communication that, as the definition goes, 'does not require a medium of transport.' Of course, this refers literally to transmission without intermediary cables or wires. The

wireless receiver or transmitter stands in for the 'medium' of wireless, so that the space through which signals travel is apparently mediumless. But wireless signals draw our attention to this space in between, the atmosphere through which wireless waves travel, the intervening medium of the air.

The Wireless Fields where Marconi's signal first sparked are now a barely legible ruin, comprised of slumping foundations and a sea-worn monument. Yet what drifts more suggestively through this space are the wide sky and ocean, those spaces of traversal and resonance that were drawn together through the first wireless transmissions. The wireless ruins draw attention to this horizon, and the atmosphere through which wireless signals made their migration. At one time, the space of communication was imagined as an etheric expanse, a medium of its own that exerted a pull upon whatever travelled through its elastic force fields. Even when the ether was scientifically reputed, there remained a language and imagination for describing this hazy space where messages and energy accumulate and transfer. Today, this language and imagination continue to have relevance. Information, as architect Toyo Ito notes, is 'active air' (Dunne 1999, 26). This active air constitutes the medium and spatiality of communication – a spatiality that is atmospheric and dynamic. In many respects, communication – wireless or otherwise – exceeds the devices, interfaces, and wires through which we typically conceive of the *medium* of communication. Indeed, we find there is another medium, an atmospheric medium, through which we can divine more than dots. This chapter charts how that first wireless exchange of 'dot … dot … dot' relocates from the ocean to the city, and multiplies towards a concentration of wireless exchanges that give rise to expanded ecologies of transmission. This chapter then explores how an atmospheric mode of communication – like the ether, resonant and electric – delineates a much different type of urban space that gives rise to emanation, presence, and surround.

City of Sparks

From the time of telegraphy and radio, wireless signals have permeated the city. Exchanges among people and increasingly among machines take place through wireless 'clouds' of communication suspended over the city. While the language of networks may prevail in discussions of urban communication, increasingly more fluid metaphors, from clouds to liquid topologies, are emerging to describe the dynamic character of

communication and mobility in the city.[3] As this chapter suggests, mobile and wireless communication in the city is atmospheric. In this sense, the wireless city is best understood through the drift and pull of its electromagnetic spectrum. From radio to sensor, distinct frequencies establish invisible circuits – not arcades and thoroughfares, but atmospheres of communication – that draw the city together as a space of multiple correspondences (Sheller 2004, 47). In the city of clouds and sparks, furthermore, we encounter fields of energy, or what Vilém Flusser calls 'flections.' 'When we are talking about a "new urbanism," Flusser writes, 'it is more useful to construct the image of the city as a field of flections' (323). The city contains zones of energy, registers of communication, mobility and magnetic attraction. These flections describe the energy and 'field of relations' through which the city 'gains contours.' Flusser further explains this city of intensities and correspondences:

> The relations among human beings are spun of differing densities on different places on the net. The denser they are, the more concrete they are. These dense places develop into wave-troughs in the field that we must imagine as oscillating back and forth. At these dense points, the knots move closer to one another; they actualize in opposition to one another. In wave-troughs of this type, the inherent possibilities of relationships among humans become more present. The wave-troughs exert an attraction on the surrounding field (including the gravitational field); ever more intersubjective relationships are drawn into them. Every wave is a flash point for the actualization of intersubjective virtualities. Such wave-troughs are called cities. (Flusser 2005, 325–6)

The trough, an in-between space, is the magnetic space of relation – it not only exists between, it attracts.[4] These troughs, furthermore, might be described as spaces of communication, as atmospheres of wireless exchange.

As zones of energy, the city is then multiply located, surfacing through intensities of exchange. Overlaid on the hard grid of pavements and architectural edges, an urban weather collects, a weather of messages and connections. 'A striking aspect of this image of the city,' Flusser writes, 'is its immateriality.' Within these flections, 'there are neither houses nor squares nor temples that are recognizable, rather only a network of wires, a confusion of cables' (Flusser 2005, 326). By allowing the usual hard and fixed image of the city to fade into the background, we can begin to take note of the ways in which seemingly

more immaterial exchanges, as transferred through wireless devices or electronic media, alter the ratio and intensity of space and time in the city. These wireless frequencies mobilize more than just media and technologies – they mobilize orders of energy in the city.

Energy is a way of understanding the intensities of space and time. It is just such an intensive reading of electronic, or 'new,' media that Marshall McLuhan called for. We should not inquire into the workings of media and communication as discrete and linear operations, McLuhan suggested, but rather as intensive and environmental phenomena, or experiences of depth (McLuhan 1994c). This depth is atmospheric. An atmosphere is composed of intensive gradations. It drifts and fluctuates between clarity and noise. It becomes saturated and weighed down with pressure, a fog of messages. And it breaks, shifts with electric, lightning-like pulses. Wireless signals collect and transmit intensively, across electromagnetic frequencies. These frequencies draw together registers of space and time. The charged transmission of electric messages then assembles orders of space and time intensively, rather than extending with blank and infinite regularity. When attempting to locate ourselves within these electric, intensive, and even topological orders of the city, we further find that we must redraw our urban maps and courses of connection. In this respect, Flusser suggests that 'the new city is not geographically locatable,' but rather, 'it is everywhere where humans open up to one another' (2005, 327).

Since their inception, wireless technologies have stimulated speculation about the new topologies that emerge through previously unimaginable connections. Indeed, correspondence via the electromagnetic spectrum was bound to draw us into radically altered conceptions of space and time. Professor W.E. Ayrton, after reading Marconi's discussion of wireless technologies published in *Electrical Review* on 15 and 22 June 1901, made a statement before the Society of Arts in London about how we might locate ourselves – electromagnetically. Ayrton envisioned a time within the not too distant future, 'when if a person wanted to call a friend he knew not where, he would call in a loud, electromagnetic voice, heard by him who had the electromagnetic ear, silent to him who had it not. "Where are you?" he would say. A small reply would come, "I am at the bottom of a coal mine, or crossing the Andes, or in the middle of the Pacific." Or, perhaps, in spite of all the calling, no reply would come, and the person would then know that his friend was dead.' Such correspondence between electromagnetic organs across unfathomable distances seemed capable of spanning almost as far as the

grave. Those endowed with these highly tuned organs could exchange messages that would be audible to no one else. So unreal did these conjectures seem at the time that Ayrton could only say that this was 'almost like dreamland and ghostland, not the ghostland of the heated imagination cultivated by the Psychical Society, but a real communication from a distance based on true physical laws' (1901, 820). When locating ourselves electromagnetically, we seem to inhabit some ghostly geography. But the ghosts, in this case, are real. They are the flickerings of an elusive, atmospheric spectrum. This spectrum, however ghostly, constitutes a space of extended inhabitation.

Spectral Ecologies

As we can see with these considerations of the spectral qualities of wireless transmissions, an atmospheric view of communication is not without precedent. Ideas about an ether of electrical or magnetic force were prevalent in the nineteenth century. The ether was originally conceived as a medium through which light or gravitational forces travelled. This 'material and vibratory medium' predated the discovery of electromagnetism, and it was understood to be the stabilizing and guiding invisible substance through which forces moved. The ether, as a stabilizing medium, only gradually fell out of favour after the delineation of the electromagnetic spectrum. Yet even with this dismissal, the ether remained a potent metaphoric device. Infused with poetic and energetic qualities, the ether was simultaneously a medium and an environment. It was an invisible yet all-encompassing atmosphere, constituting an 'undulating spatial foundation upon which the mobile contents of radiant energies were propped' (Clarke and Henderson 2002, 21). In this sense, it was even conceived of as jelly – as though all of space were 'filled with jelly' – and as an elastic medium through which energy and 'lines of force' travelled (21). This jelly, atmospheric broth, or elastic medium resonates with what Jeffrey Sconce discusses as the 'etheric "ocean" of the nineteenth century. He writes, 'The advent of wireless at the turn of the century heralded a radically different vision of electronic presence, one that presented an entirely new metaphor of liquidity in telecommunications by replacing the concept of the individuated "stream" with that of the vast etheric "ocean" (Sconce 2000, 14).[5] Even as the ether came to be discredited, wireless technologies then gave renewed attention to an oceanic or atmospheric view of communications.

Indeed, while one version of the ether fell into disfavour, multiple other versions grew up in its place. Joe Milutis (2006) notes in his study on the ether that 'Hertz and Helmholtz found the ghost of the visible-light spectrum and translated the luminiferous ether of the nineteenth century into the electromagnetic spectrum of the twentieth' (38). The ether quickly transformed first into the electromagnetic spectrum and then into a series of 'standardized wavelengths' that were cordoned into designated uses by the U.S. Radio Act of 1911 (78). With this designation, the ether seemed to move closer to earthly territory. Indeed, the current delineation of the radio portion of the electromagnetic spectrum reads as an elaborate property map, drawn as it is in bands of varying width. Radio or wireless frequency allocations appear more as an urban grid, than as fuzzy zones of sky that correspond to a jumble of transmitters and receivers. Multi-modal and multi-mobile, the chart delineates a confluence of spaces, from sea to air and land; and a convergence of uses, from radio to mobile devices and weather satellites. Yet this 'spectral' space is perhaps best characterized, not as regions with sharp boundaries, but rather as overlapping, simultaneous, and even interfering electric atmospheres. The spectrum, with its electromagnetic fields of the sort that nineteeth-century physicists imagined, contains 'neighbourhoods' of electricity and populations of intensity (Lockhurst 2002, 75-88). These spectral neighbourhoods are less topographical and more topological. In this respect, Milutis suggests, 'one might want to call the ether (as distinct from the ownable plots of the electromagnetic spectrum or the unattainable vibrations known to the third eye) a fabric of signs that is both material and phantasmic, an electronic rain that is continuously decoded and received in common or poetic ways' (Milutis 2006, 85).

What is it that this material and phantasmic ether still allows, even when science declares its inaccuracy? What do these spectral ecologies enable that might otherwise be lost in the hard logic of frequency allocations? As Michel Serres (1982) suggests, the fuzzy space of the spectrum may allow us to open our eyes to the expansive, even atmospheric, space between previously conceived sharp boundaries. He writes:

> The Devil or the Good Lord? Exclusion, inclusion? Thesis or antithesis? The answer is a spectrum, a band, a continuum. We will no longer answer with a simple yes or no to such questions of sides. Inside or outside? Between yes and no, between zero and one, an infinite number of values appear, and thus an infinite number of answers. Mathematicians call this

> new rigor 'fuzzy': fuzzy subsets, fuzzy topology. They should be thanked: we have needed this fuzziness for centuries. While waiting for it, we seemed to be playing the piano with boxing gloves on, in our world of stiff logic with our broad concepts. Our methods can now be fine-tuned and in the process, increased in number. (57)

Neighbourhoods within the electromagnetic spectrum are located not necessarily side by side, but through connection, emanation, and intensity. As McLuhan points out, electricity is, importantly, not about containment, but rather about relation and position between bodies. 'Again, as more is known about electrical "discharges" and energy, there is less and less tendency to speak of electricity as a thing that "flows" like water through a wire, or is "contained" in a battery. Rather, the tendency is to speak of electricity as painters speak of space; namely, that it is a variable condition that involves the special positions of two or more bodies' (McLuhan 1994a, 347). This variable and electric condition is atmospheric. It provides an expanded frame of reference for conceiving of communication – wireless and otherwise – in the city.

Atmospheric Medium, Wireless Milieu

The space that wireless communications seems to cancel from view – the ether, air or atmosphere – then emerges here as a necessary area of investigation. This hazy, electric, and intermediary space is, by many accounts, the medium that enables us to communicate in the first place. As Serres (1982) writes, the atmosphere is at once an intervening and enabling medium. It is far from the airless world of black and white categories and simple systems, which is an 'imaginary world' only possible 'on the moon,' Serres argues, 'without any atmosphere' to provide the basis for differentiation, where 'no one can see a thing.' In this sense,

> The atmosphere, the air, the milieu (the medium), makes light diffuse; it outlines obstacles, lights the other side of walls, single-point light sources producing scallops and patterns. In order to have only light, one would have to live at the single-point light source, or the medium would have to be removed, creating a vacuum. As soon as the medium intervenes, the ray of light wanders about the world. We see only because we see badly. It works only because it works badly. Every system is a set of messages; in order to hear the message alone, one would have to be identical to the sender … As soon as we are two, there is a medium between us, the light

> ray is lost in the air, the message is lost in the interceptions, there is only a space of transformation. (69–70)

When Marconi discerned the 'dot … dot … dot' of the first transatlantic wireless transmission, he had to listen through the atmospheric static for a legible sign. Yet this same static that seemed to impede a clear reception was the very medium that allowed the transmission to take place. In the attempt to detect signals out of atmospheric static, Marconi further placed emphasis on the communicative equipment that continues to occupy the centre of attention today. Here were fan aerial and receiver, telegraphic signal and decoded message. The surrounding atmospheric medium may have fallen from view, but it has continued to lurk in the background as an inevitable aspect of communication. From media ecology to mediology, from mediasphere to media environment, various notions of a media surround have been employed to convey the idea that the medium does not begin and end with the screen, cable, box, or receiver. In this respect, Régis Debray (1996), who works through the concept of the 'mediasphere,' suggests the sphere of media cannot even be limited to something external, but is, again, something more topological. As Debray writes, 'Mediological man does not cohabitate with his technological surroundings, he is inhabited by his habitat; constructed by the niche he has constructed' (111). As this chapter suggests, the medium of wireless technology can be approached as just such a habitat, as a milieu that is as atmospheric as fixed.

The medium, as writers from Friedrich Kittler to Régis Debray have suggested, is a field of relations. Rosalind Krauss points to 'the medium's aggregate condition' as evidence of the difficulty of drawing a boundary around any medium. This aggregate or 'compound idea of the "apparatus" refers to all of the medium's supports: in the instance of film, from celluloid to projector, light, screen, and beyond (Krauss 1999).[6] But the apparatus, or medium, is even more than its raw material. It also includes economic, political, and social contexts; spatial and temporal registers; cultural practices and modes of circulation. These elements can never be scrubbed away from the planar dimensions of the interface, or from the seemingly innocuous glow of the latest gadget. While the 'medium' may acquire its distinctness by its instantiation and use – a radio, for instance, conceived of as a certain frequency, broadcasts, and a transmitter encased in a black plastic box with antenna and dial – it also inhabits a larger landscape that spans from the history of wireless to Clear Channel. In this sense, perhaps the

distinctness of the radio as radio is not necessarily undone, but the idea that radio is only 'the radio' is.

The question that emerges is whether we should then locate the medium in the physical artefact, the screen, the message, the wires, the network, or all of the above. What the Wireless Fields indicate is that we may even reconsider the 'medium' as an assemblage or, in other words, as an atmospheric media landscape. Every formation of 'the medium' gives rise to a shifting media landscape, and delineates a dynamic space in and through which we forge our understanding of communication and its apparatuses. How these atmospheric landscapes are traversed, inhabited, and extended becomes the very basis for understanding the medium. In this respect, Debray (1996) writes, 'The error of futurologists and disappointment of futurists commonly arise from overestimating the *medium's* effect by underestimating the *milieu's* weighty plots' (16-17). In this estimation, the medium is at once a process of mediation and a middle space, an environment. When answering the question 'what is a mediasphere?' Debray suggests, 'the chronological unifier can be called the *mediasphere, or middle ground, setting or environment* [milieu] *of the transmission and carrying* [transport] *of messages and people*' (26). The medium, as milieu, importantly involves the exchange and mobility of signals. In this respect, Debray writes, 'A mediasphere's space is not objective but trajective. It would therefore be necessary to hazard the term "mediospace," the relation of a given surface area to a duration. The "ball of earth" as a mediospace of the graphosphere is not the same as that of the videosphere. The one has a circumference of three years (Magellan) and the other of twenty-four hours (Airbus)' (29). Clearly, the spheres, spaces, and milieu that Debray draws out have important connections to this inquiry into the atmosphere of communications in the wireless city. We arrive in this discussion not just at an awareness of the environment of communications, but also of its emergent and contingent properties. The *atmosphere* is quite literally the space through which wireless signals travel, but it is also the historic and poetic substance that has enabled the speculation towards communication without wires, as well as a social, political, and economic apparatus. An atmospheric construct further enables a sense of the relation between electromagnetic trajectories and new geographies, whether the 'ball of earth' or cities. Wireless technologies do not just connect spaces; they give rise to new and shifting spatial and temporal orders.

In addition to Debray's discussion of Magellan and Airbus above, we can then add such wireless spheres as Nikola Tesla's (1995) 'World

Wireless System.' Another early pioneer of wireless, Tesla was responsible for critical developments within wireless technology. Yet his proposition for a 'World Wireless System' ultimately fell short of commercial success or practical use. With his 'World Wireless System,' for instance, Tesla proposed nothing less than the wholesale excitation of the earth through the application of wireless energy. As he elaborates, this system

> makes possible not only the instantaneous and precise wireless transmission of any kind of signals, messages or characters, to all parts of the world, but also the inter-connection of the existing telegraph, telephone, and other signal stations without any change in their present equipment. By this means, for instance, a telephone subscriber here may call up and talk to any other subscriber on the Globe. An inexpensive receiver, not bigger than a watch, will enable him to listen anywhere, on land or sea, to a speech delivered or music played in some other place, however distant. These examples are cited merely to give an idea of the possibilities of this great scientific advance, which annihilates distance and makes that perfect natural conductor, the Earth, available for all the innumerable purposes which human ingenuity has found for a line-wire (Tesla 1915, 87).

Tesla's system quite literally performs the mobilization of the earth in its entirety as a wireless electrical system. This excitable planet would be in comprehensive and instant communication, enshrouded in an atmosphere of signals (Tesla 1995). With this mobilization, matter becomes electrical, and the planet acquires a new climate of wireless energy. Following upon Michel Serres and Bruno Latour, Steven Connor remarks on the contemporary movement towards such conceptions of matter that are more volatile, 'gaseous,' and informational. 'If history is marked by the movements, not from element to element, but between different states of the same element,' Connor (2004) writes, 'then time (*temps*), as Serres often takes pleasure in pointing out, becomes indistinguishable from temperature – or weather (*temps*). Solidity is just another way of naming speed …' (105-17). With Tesla's 'World Wireless System,' planetary time has condensed to a matter of seconds. With this condensation comes an increasingly atmospheric conception of matter. Wireless technologies facilitate the movement towards fluidity, speed, and instantaneity. By extension, the time or *temps* of wireless then has a distinctly atmospheric *temps* or weather. How can we begin to discuss this distinctive weather in the wireless city to encompass the gaseous, the mercurial, and the meteorological?

Data clouds

It is no accident that urban wireless networks put in place today bear the name of 'cloud networks.' One of the primary wireless providers in London, which charges for its service, is known as The Cloud, or Cloud Network. The Cloud is currently extending is atmospheric coverage over London by developing a citywide system of transmitters in lampposts. While these clouds may come at a price, they move towards a more localized version of Tesla's proposal for an expansive wireless system. With the development of these clouds, the city acquires an atmosphere of communications, a weather of signals. McLuhan suggests that early developments in the telegraph actually enabled the further refinement of weather forecasts, and that in many ways this technology enabled a new attention to 'weather dynamics.' As McLuhan (1994b) writes, 'It is clear that telegraph, by providing a wide sweep of instant information, could reveal meteorological patterns of force quite beyond observation by pre-electric man' (257). In many ways, this statement reveals how the telegraph not only brought attention to the weather, but also created weather, and came to operate as weather. Instant, electric, and global, telegraphic and wireless signals offered improved means for monitoring shifting and dynamic climatic phenomena because they also were shifting and dynamic technologies of atmospheric proportions.

Clouds then become apt descriptors of the wireless city on many levels. Clouds appear to be at once material and immaterial, emerging through a simultaneous process of formation and dissolution. They are visible only to become invisible, spectres of transformation. Airborne and ephemeral, they also graze structures and deposit residue. Clouds layer onto other architectures, moving through and transforming these seemingly impermeable forms. All that appears immobile at another level mobilizes through the transfer of energy. Hubert Damisch (2002) aptly describes these qualities of clouds through a discussion of painting when he writes, 'On a conceptual level, a "cloud" is an unstable formation with no definite outline or color and yet that possesses the powers of a material in which any kind of figure may appear and then vanish' (31). These clouds often stand in contrast to the representational devices of fixed perspective, because 'the sky does not occupy a place, and cannot be measured; and as for clouds, nor can their outlines be fixed or their shapes analyzed in terms of surfaces. A cloud belongs to the class of "bodies without surfaces," as Leonardo da Vinci was to put it, bodies

that have no precise form or extremities and whose limits interpenetrate with those of other clouds' (124). Like the remote reverberation of wireless signals, clouds are beyond perspective and elude the fixed horizon; they travel in a space that does not exclude but is neither settled into lines. In many respects, the drift of these clouds – wireless, electric, informational – requires that we reconsider the city through the air. Instead of fixing on the pavement, we can begin to consider the more atmospheric transmissions and dynamic relations of cities.

The Public Electric

Through these more atmospheric dynamics, moreover, we can gain insight into the shifting publics that emerge in the wireless city. As Mimi Sheller (2004) suggests, 'Publics, in this formulation, are special moments or spaces of social opening that allow actors to switch from one setting to another, and slip from one kind of temporal focus to another' (48). Such switching and mobility reveal yet another aspect of the atmosphere of wireless communications, where the weather of messages provides access to a collective sense. This collective sense emerges in many discussions of media, electricity, and the ether.[7] McLuhan makes frequent reference to a media sensorium, where the 'central nervous system' is 'outered' to become a technological field (McLuhan 1994b, 247). So, too, does Milutis (2006) refer to the 'electric sensorium' of the ether (78). These electric and mediatized sensoriums in many ways are attempts to draw together a space of collective sensation that is persistently elusive. The electric sensorium is just as nebulous as the ether, a charged space of electrical storms that must draw us together into some atmospheric exchange. This electric sense is the sixth sense; it is that electrical sensation that reportedly we once had but have since lost. While animals such as sharks have a distinct ability to detect and respond to electrical fields, we can only conjecture through the shadow of sensory memory what the effects and trajectories of wireless signals and electricity induce. Our mobile and wireless devices may allow a dim prosthetic access to this electric sense, but the public electric remains largely a project of the imagination. But this is not necessarily a bad thing. Perhaps it is exactly these moments of imaginative induction that give rise to considerations of where public space is located in the spectrum of the wireless city: not just as a delineated frequency, but as a necessary interpretation at the juncture of multiple and complex social and technological processes.

In the early development of wireless, another inventor working simultaneously to Marconi took a much different approach to this technology. J.C. Bose, an Indian physicist working in Calcutta, began orchestrating wireless effects in 1894, at the same time that Tesla was making proposals for wireless and radio communication. Using wireless transmissions of electromagnetic waves, Bose sent sparks through gunpowder and rang bells at a distance. Bose went on to meet Marconi, but he was deliberately not interested in developing wireless for commercial use.[8] In the work of Bose, the spectrum remained an open space, a commons for the electromagnetic public. The spectrum as commons is perhaps a much less popular notion today, even though it seems self-evident on many levels that nothing could be so public as the air. Writing on the public aspect of radio, Gillian Beer (1996) notes that 'radio produced a new idea of the public, one far more intermixed, promiscuous and democratic than the book could cater for' (150). The unimpeded storm of messages travelling over the airwaves assembles as a space of potential connectivity, a space 'we switch in and out of' (149). On the airwaves there exist potential publics that can shift, assemble, and disperse at any time. This spectral commons reconfigures the city to suggest that we no longer map the virtual or physical, but rather register the intensity of electric atmospheres of communication. Indeed, Sheller (2004) writes, 'publics are no longer usefully envisioned as the open spaces or free spaces in which diverse participants could gather,' but rather 'the capacity for publics to emerge remains a property of the structures of connectivity' (50).

The technological medium operates as a charged electrical environment that informs how urban spaces and publics emerge. New public spaces and actions emerge through the spectrum, whether on the 'amateur' band or at proliferating sites of transmission and reception. Such a conception resonates with another set of atmospheres – the 'Atmospheres of Democracy' explored by Bruno Latour and Peter Weibel in the recent 'Making Things Public' exhibit at the ZKM in Karlsruhe. In the catalogue for this exhibition, Latour explains that by investigating the atmospheric qualities of democratic assembly, the show attempts to understand the more fleeting or event 'phantom' qualities of publics. Publics and public space are not only mobile, they are also potentially transitory, formed through shifting assemblages of 'things' or issues of concern that are continually coming into being (Latour 2005). To make things public is an atmospheric concept and practice. As this paper suggests, atmospheric modes of communication

open up spaces for thinking through the energies and possibilities of these public assemblies. In the wireless milieu, intensive and imaginative ways of configuring publics – and cities – emerge as a distinct potential of this atmospheric mode of inquiry.

NOTES

1 Marconi reportedly stated that, at the time of the transmission, 'the chief question … was whether wireless waves would be stopped by the curvature of the Earth. All along, I had been convinced that this was not so. The first and final answer came at 12:30 when I heard ... dot ... dot ... dot' (Briggs 2001).
2 As many historians and scholars of wireless technology have noted, Marconi did not necessarily 'invent' wireless technology, nor was he the only pioneer working in this field at the time. Many scientists across the world, including Nikola Tesla, J.C. Bose, and A.S. Popov, were involved with wireless developments. Marconi, however, is often considered the first person to achieve success with *commercial* applications of wireless technologies. See Hong, 2001 for further discussion of the rise of wireless technologies and contested lines of authorship.
3 For more on the contrast between network and fluid models of urban mobilities, see Sheller, 2004. As Sheller writes, 'Whereas networks connect smaller units into larger entities, and such entities in turn form their own networks which constitute still larger social organisations, a gel is something in which such levels are not distinct. If we understand socialities as always grounded in physical space and time, but in contexts of sheer messiness, we may need to think about social life in nonnetwork terms' (47).
4 Régis Debray similarly notes in his study on the mediasphere, 'It is in reality the intermediate spaces and time, the betweenness of two things or periods, the trough of the wave [les entre-deux], that are decisive; but our language works the opposite way: it spontaneously subordinates the signs of relation to those of being, and doing to being' (1996 [1994], 11).
5 See also Connor 2004 on similar conceptions of electricity as atmospheric 'effluvium' or networked circuitry.
6 See also Kittler, 1991.
7 For more discussion on wireless technologies and the urban sensorium, see Gabrys 2007a.
8 See Bose, 1927.