Scott McQuire, 'Immaterial architectures: urban space and electric light', *Space and Culture*, vol. 8, no. 2 (May 2005) 126-140.

Immaterial architectures: urban space and electric light

Scott McQuire

> Electricity is the pervading element that accompanies all material existence, even the atmospheric. It is to be thought of unabashedly as the soul of the world. [Goethe, 1825]
>
> Electrification + Soviet Power = Communism [Leninist slogan of the 1920s]
>
> If you build buildings with lights outside, you can make them indefinite, and then when you're through with using them you shut the lights off and they disappear. [Andy Warhol,1975][1]

From the first moment of its recognition as an independent phenomenon, electricity has been a source of profound wonder. Romantics rapidly identified it with a universal life force, dramatised in the archetypal modern creation scene of Mary Shelley's 1818 *Frankenstein* and distilled by no lesser authority than Goethe into 'the soul of the world'. A century later, the prospect of widespread electrification literally dazzled the industrializing world, inspiring entrepreneurs, artists and revolutionaries alike with irresistible visions of a dynamic, electrified future. The electrification of industry and transport, combined with the extension of electrical grids into public streets and private homes, has been one of the key vectors of technological change demarcating industrial modernity from previous social forms.

Yet, while there are a plethora of biographical accounts of the discoveries and business strategies of inventor-engineers such as Edison and Tessler, and numerous economic histories of the ferocious patent wars and internecine political struggles to form some of industrial capitalism's most powerful corporations such as General Electric and Westinghouse, there is a relative dearth of social histories examining the impact of electricity on everyday life.[2] Even scarcer are accounts of the way in which electricity has contributed to the formation of a distinctively modern sense of space, most dramatically through the electrical illumination of the modern cityscape, altering the city's appearances, rhythms and modes of social inhabitation.

However, in the absence of systematic accounts, what can be found are snippets scattered through the writings of artists, architects, journalists, filmmakers and other observers of the modern city.

One thing most of these reports make clear is that, even from the first, electrical illumination exceeded a purely functional role.[3] In this essay, I want to trace this excessive use of light to argue that the inception of electrical lighting in the period from the 1880s up to the second World War marks a fundamental threshold in the psychogeography of modern urban space. This threshold both parallels and converges with the effects of modern media technologies, resulting in the creation of lived environments in which the traditional function of architecture as a stable ground for experience has increasingly given way to a growing mutability and fluidity of appearances.

Electricity and the technological sublime

As early as 1885, when Edison's incandescent lamp was less than a decade old and the illumination of public space a rarity, a scheme was mooted for lighting the entire city of Paris with what was grandly dubbed an 'artificial sun'.[4] The plan comprised one hundred 200 000 candlepower lamps mounted on a single tower soaring 1100 ft in the Tuilleries Gardens. The fact that the scheme was both impossible, because lamps of such magnitude hadn't yet been invented, and impractical, because lighting the cityscape from one point would cause enormous contrasts of light and shadow, merely underlines the extent to which the very idea of electrical illumination has long had a powerful symbolic pull. By the 1880s, when electrical systems began to be widely adapted to practical uses, electricity was seen as the key to achieving a new level of control over the lived environment. The ability to convert night into day at the flick of a switch offered the most striking proof of the superiority of the modern present over the past, the most compelling evidence of the ability of technological progress to subdue even the basic diurnal rhythms of nature.

Equally telling is the rapture with which many people greeted their first sight of electric light. Only four months after Edison's famous demonstration outside his laboratories at Menlo Park in December 1879, the city fathers at Wabash hired the Brush Company to set up four 3000 candlepower arc lights on the courthouse. The event attracted 10 000 visitors to the small town. The local paper reported:

> People stood overwhelmed with awe, as if in the presence of the supernatural. The strange weird light exceeded in power only by the sun, rendered the square as light as midday ... Men fell on their knees, groans were uttered at the sight, and many were dumb with amazement. (Quoted in Nye 1990: 3)

While it is probably wise to take such a tale with a grain of salt — after all, boosterism is grist to the mills of small town papers, which also reported that local farmers could expect giant pumpkins and corn stalks as a result of the new light— the report of the spectators' reaction shouldn't be discounted too quickly. Even read as an apocryphal tale in the genre of credulous cinema audiences fleeing the image of the Lumière Brother's onrushing celluloid train, it registers the extent to which electricity departed all previous protocols of illumination.[5] Prior to the 1880s, artificial light came only from various forms of fire. Candles, kerosene and even gas were smoky, potentially dangerous flames whose ability to illuminate was clearly linked to their consumption of fuel. By contrast the enclosed, vacuum-sealed incandescent light bulb was a paradox; a light which was smokeless, fireless and seemingly inexhaustible. Moreover, its intensity vastly exceeded anything previously seen or experienced, leading some female onlookers to resort to parasols so as to protect

their complexions. Electric light seemed an anomaly which contravened natural laws, but it was experienced by most nineteenth century observers as miraculous rather than monstrous.

The image of the Wabash public gazing at arc lights in silent awe indicates the extent to which electrical illumination belongs to what Leo Marx (1965) has aptly called the technological sublime. In the Romantic tradition, the sublime was linked to the grandeur of nature, and the ambivalent feelings of wonder and terror natural phenomena evoked. For Marx, the 'technological sublime' describes the widespread transference of these feelings onto technology around the end of the nineteenth century. One of the key sites for this transference was the appearance of massive industrial machinery such as the electrical turbine, an apparatus which generated not only electrical current, but a seemingly irresistible series of concepts and metaphors. As electricity entered everyday life in industrializing cultures during the 1880s, 'live wires', 'human dynamos' and 'electrifying performances' all became recognisable descriptors for a specific form of modern energy. To feel electricity in the air became synonymous with excitement, arousal and even love.

Bright lights, big city

It was in this context that electricity spread through the modern cityscape in several waves. Initially confined to isolated sites such as the mansions of the wealthy and a few department stores seeking a novel means of attracting shoppers, it gradually expanded into public street lighting schemes along major transport routes, before finally extending into large numbers of private homes.[6] While public lighting had been recognized as an important technique in policing public space since its origins in the sixteenth century, the spread of electric light exceeded any rational desire for maintaining public order.[7] As noted above, the first demonstrations of electric light proved capable of themselves attracting large crowds of fascinated onlookers. This realization inspired progressive entrepreneurs to install electric lighting as a novel form of advertising, particularly around city centre businesses such as theatres and department stores. Other businesses learnt to organize block street lighting, often via deals with electricity supply companies, as a way of attracting shoppers to their precinct at night. Electricity suppliers were happy to offer cheap power to increase the intensity of street lighting, recognizing its potential as a load-builder, since a brightly lit street required corresponding increases in lighting of shop windows and signage. Adjoining areas were often forced to sign up too, as a defensive action. As Nye notes, this dynamic was a key to the extension of electric light in US cities prior to World War I:

> Shopkeepers understood lighting as a weapon in the struggle to define the business centre of the city, dramatizing one sector at the expense of others. (1994: 177)

While these changes produced significant effects on the look of the city, they were ad hoc and unevenly distributed. The first systematic explorations of the possibilities for using electric light to alter the appearances and ambiance of urban space occurred in the controlled environments of the World's Fairs from the 1880s to World War I. It was here, in what Benjamin (1973: 165) aptly dubbed 'places of pilgrimage to view the fetish Commodity', that governments and corporations combined to produce coherent visions of a fully electrified society for public display.[8] The 1876 Philadelphia Exhibition is notable in being the last major exhibition based on steam power; it was also one of the last which closed at night. After the 1879 London Exposition featured Edison's new incandescent bulb as a chief attraction, subsequent fairs became key sites for lighting innovation.

Electric signs, flashing signs, the searchlight, the spotlight and the floodlight were all first publicly displayed at World's Fairs.

Electrical lighting of the fairgrounds undoubtedly had utilitarian appeal, extending the hours available for leisurely consumption in the same manner that factory lighting had already extended the productive hours demanded of the working class.[9] However, far more striking was the excess over pure utility, as each city sought to outdo its rivals in the number of lights and the power of their illumination. The Chicago World's Fair of 1894 not only had more lights on its Electrical Building alone than were used by the entire Paris Exhibition of 1889 for which the Eiffel Tower had been built; the Chicago fairgrounds also contained more light than any contemporary city in the United States. As Nye (1990: 37) points out, millions of visitors to these fairs saw more artificial light than they had ever seen in their lives.[10] They also saw it used in dramatic new ways; to delineate the outlines of buildings and pathways, to illuminate fountains and water jets, to probe the depths of the night sky. *Cosmopolitan*'s reporter described the scene at Chicago in what can only be called glowing terms:

> Look from a distance at night, upon the broad space it fills, and the majestic sweep of the searching lights, and it as if the earth and sky were transformed by the immeasurable wands of colossal magicians and the superb dome of the structure that is the central jewel of the display is glowing as if bound with wreaths of stars. It is electricity! When the whole casket is illuminated, the cornices of the palaces of the White City are defined with celestial fire. (Quoted in Nye 1990: 38)

By the early twentieth century the emphasis began to move away from the sheer quantity of lights to the use of hidden lighting which enabled buildings to be displayed as striking forms in integrated artificial landscapes. Electric lighting granted a far greater level of control over appearances than had the softer light of gas lamps which required manual lighting and extinguishment. Electrification, with its capacity for automating and coordinating a range of 'actions-at-a- distance', accentuated the possibilities of orchestrating rapid changes in lighting across large surfaces. Lighting effects enabled buildings to be variously represented as a collection of independent architectural details, or, alternatively, abstracted into a sculptural whole carved out of the surrounding darkness. Moreover, this process could be enacted as a time-based spectacle for a mass audience, who experienced in the outside world a succession of effects previously reserved for the interior spaces of the theatre, panorama and diorama. The world's fairs showcased the potential for electric lighting to establish a new rhetoric of urban space, opening the way for the city to be transformed into a performative space in which fixity of appearances would give way to increasing flux.

The new lighting techniques migrated rapidly from the idealised urban spaces of the World's Fairs into more prosaic but no less fantastic environments such as the amusement parks on Coney Island outside Manhattan. Maxim Gorky's visit to Luna Park in 1907 found him entering a fabulous terrain composed of 1.3 million lights:

> With the advent of night a fantastic city all of fire suddenly rises from the ocean into the sky. Thousands of ruddy sparks glimmer in the darkness, limning in fine, sensitive outline on the black background of the sky shapely towers of miraculous castles, palaces and temples. ...

> Fabulous beyond conceiving, ineffably beautiful, is this fiery scintillation. (Quoted in Koolhaas 1994: 29)

In the city centre, the installation of street lighting and interior lighting for major businesses, was followed by the adoption of electrical signs as a widespread form of spectacular illumination. The first blinking sign, spelling E-D-I-S-O-N, had been shown at the London Exhibition of 1882. By 1900, the use of commutators made it possible to organize visual sequences capable of producing the illusion of motion, exploiting the same effect of persistence of vision used by cinema. By 1910, more than twenty blocks on Manhattan's Broadway were covered in electrical advertising. The intensity of illumination lent the thoroughfare its famous sobriquet, and the 'Great White Way' would soon be imitated by countless cities laying their own claim to being 'modern'.

Such dramatic shifts in urban appearances did not go uncontested. As early as 1896, the proliferation of advertising signs in New York led William Dean Howells to observe:

> If by any chance there is any architectural beauty in a business edifice, it is spoiled, insulted, outraged by these huckstering appeals. … It seems as if the signs might eventually hide the city. That would not be so bad if something could be done to hide the signs. (Quoted in Nye 1994: 187)

Electric lighting greatly accentuated the prominence of advertising signs, leading to the formation of associations in major cities such as New York and London with the aim of having objectionable signs removed or their construction blocked. Undaunted, large corporations in the US took brand promotion to a new level by floodlighting their skyscrapers. Icons of the age, beginning with the Singer Building in 1907, were baptised in light, the expense justified by their conversion into blazing symbols visible to millions. The Woolworth Building, which took over the mantle of world's tallest in 1913, had exterior surfaces designed with electrical illumination in mind.

If the messy commercial reality of this electrified environment offended the *beaux-arts* aesthetic, with its preference for the orderly neo-classical lighting and idealized urban spaces on display at the world's fairs, it proved ready-made for the European *avant-garde*. On his arrival in New York in 1917, Marcel Duchamp famously declared the entire city to be a work of art. When the great revolutionary poet and modernist proselytizer Vladimir Mayakovsky visited New York in 1925, he was impressed above all by the lights of Broadway:

> The street lamps, the dazzling lights of advertisements, the glow of shop windows and windows of never-closing stores, the lights illuminating huge posters, lights from the open doors of cinemas and theatres, the speeding lights of automobiles and trolley cars, the lights of the subway trains glittering under one's feet through the glass pavements, the lights of inscriptions in the sky. Brightness, brightness, brightness...'. (Quoted in Woroszylski 1971)

Filmmaker Sergei Eisenstein's first impressions of New York register its vertiginous impact in strikingly cinematic terms:

> All sense of perspective and of realistic depth is washed away by a nocturnal sea of electric advertising. Far and near, small (in the *foreground*) and large (in the *background*), soaring aloft and dying away, racing and circling, bursting and vanishing — these lights tend to abolish all

> sense of real space, finally melting into a single plane of coloured light points and neon lines moving over a surface of black velvet sky. It was thus that people used to picture stars — as glittering nails hammered into the sky. (Eisenstein 1963: 83)

While Eisenstein was prone to conceptualising a wide range of phenomena, from literary images to Marxist dialectics, in terms of cinematic montage, his comparison alerts us to the extent to which the electrification of the modern city created a new perceptual matrix which strikingly paralleled the experience of cinema. The coincidence is still worth remarking. At the same moment in history that electric light charged the cityscape with spectacular effects previously reserved for specialized showplaces, the spread of new modes of rapid transit and the proliferation of glass architecture functioned to set every urban traveller's eye on a collision course with this shimmering, phantom city. This fusion of light, highly reflective surfaces and mechanized movement rapidly became a hallmark of the modern city, establishing a spatiality which was both exhilarating and disorienting to its inhabitants. What emerges for the first time is an *other* city, an oneiric city which exists only at night and whose dream forms have only tenuous connections to the prosaic spaces of the waking day.

The oneiric city

The experience of the modern city seen at night under electric lights conferred a novel sense of mutability on the previously immutable and monumental, converting the stasis historically associated with architecture into a play of dynamic surfaces and seemingly plastic forms. The new skyscrapers of Chicago and New York, pierced by ever-greater windowed areas, or skinned entirely with glass curtain walls, proved most susceptible to the growing sense of architectural ephemerality. To some observers, light seemed capable of dissolving their mass entirely. After visiting New York in 1910, Ezra Pound was moved to describe the evening city as the most beautiful in the world:

> It is then that the great buildings lose reality and take on their magical powers. They are immaterial; that is to say one sees but the lighted windows. Squares after squares of flame, set and cut into the aether. Here is our poetry, for we have pulled down the stars to our will. (Quote in Kenner 1975: 5)

In France, where electric lighting operated on a far more restricted scale than in the US, Le Corbusier's characteristic enthusiasm for new technology emphasized the possibilities for the transformation of architecture:

> One Armistice Day in the evening, M. Citroën offered us that undreamed of revelation: a floodlit Place de la Concorde. Not just lit up by its street lamps, or the Republic's standardized little gas flames, but illuminated with all the floods of light made possible by electricity. The idea had come from America, the projectors from the war. It was (and continued to be every evening) one of the most astounding lectures on architecture that it would be possible to attend "in this wide world". Sublime straight lines, and oh, sublime French rigor! On that Armistice night a dumbfounded crowd standing in the square, held in the grip of a grace unshadowed by a single jest, – on the contrary, of a grace imperious in its command – that crowd was able to listen *to architecture itself*. (Corbusier 1964: 178)

Corbusier's vision of electric light converting mute architecture into a living, *speaking* entity situates the uncanny resonance of the new technological cityscape. In his famous 1919 essay on 'The Uncanny', Freud (1955: 219-252) defines the concept to include experiences in which inanimate objects seem to come to life, suggesting the sensation of the uncanny emerges in situations in which the boundary between the animate and the inanimate has become uncertain.[11] What Corbusier describes above as a command performance in the *son et lumiere* tradition, in which controlled light is used to unlock the tongues of buildings, was becoming an increasingly important part of everyday experience, particularly in the United States where nightly 'floods of light' converted the city into a dynamic field of shifting intensities. The alteration of customary relations of dimension, distance, and materiality, as architecture came to life under the influence of lights, created a strange environment which no longer easily conformed to the stable 'ground' of the traditional city. The apparent loss of physical solidity, the rapid alteration of scale and proportion, the intermingling and overlapping of previously discrete spaces intensified the ambiguous relations between reality and fantasy, the animate and the inanimate, which characterize the urban uncanny.

The concept of the uncanny, like that of the 'technological sublime' with its heightened mix of fascination and fear, is useful in focusing our attention on the ambivalence which dogs the ideal of the electrified city, undermining every attempt to split the rational precept of Corbusier's 'radiant city' from its supposedly irrational double, the overcrowded Manhattan which gave birth to what Koolhaas (1994: 10) dubbed the 'culture of congestion'. In practice, the orderly use of light as an integrated element of rational design has inevitably been overtaken by the *excessive* use of light for spectacular forms of display. In this regard, it is important to recognize the extent to which the city flooded with light and its double, the shadowy city at the dark heart of expressionism and film *noir*, are recto and verso of the same developmental forces of commodity capitalism. Nevertheless, the dream of their bifurcation has structured many of the key theoretical treatises of modern architecture, as well as a host of popular narratives. Exemplary of the latter is Thea von Harbou's novel *Metropolis* (which formed the basis for husband Fritz Lang's epic film in 1926):

> The workman No. 11811, the man who lived in a prison-like house, under the underground railway of Metropolis, who knew no other way than that from the hole in which he slept to the machine and from the machine back to the hole – this man saw, for the first time in his life, the wonder of the world, which was Metropolis: the city, by night shining under millions and millions of lights.
>
> He saw the ocean of light which filled the endless trails of streets with a silver, flashing luster. He saw the will-o'-the-wisp sparkle of the electric advertisements, lavishing themselves inexhaustibly in an ecstasy of brightness. He saw towers projecting, built up of blocks of light, feeling himself seized, over-powered to a state of complete impotence by this intoxication of light, feeling this sparkling ocean with its hundreds and thousands of spraying waves, to reach out for him, to take the breath from his mouth, to pierce him, suffocate him ... (von Harbou, n.d: 50-51)[12]

More noteworthy than von Harbou's florid prose is her recognition that, as much as the absence of light in the worker's underworld is at issue in the vertically stratified metropolis, so is the excess of light in the pleasure zones above. Unlike God's own light, which served to clarify truth for Descartes in his moment of radical doubt, electric light not only illuminates but intoxicates, doubling and redoubling the city, recreating the material bulk of its buildings, streetscapes and squares as floating, dematerialized zones.

In this 'ecstacy of brightness' the modern subject experiences the apotheosis of the technological sublime. The wholesale alteration of familiar spatial relationships promoted a new sense of fantasy, or rather, transformed the night city into a scene of fantasy. As Zizek (1992:8) points out, 'fantasy space functions as a kind of screen for the projection of desire'. The oneiric night city rapidly became a key site, the symbolic screen on which the contradictory desires of the twentieth century's 'new man', split between restless ambition for the endless conquest of new frontiers and a nostalgic longing for the security of a stable home, would be projected and played out.

The recto/verso dynamic of spectacular illumination is also important in appreciating the way electrical lighting has contributed to the creation of a new 'map' of the city. Not only did lighting illuminate key urban landmarks, it effectively deleted others, casting unattractive areas into impenetrable darkness. This capacity for architectural erasure was clearly appreciated by Andy Warhol, who shot his most notorious film, the eight hour *Empire*, following the floodlighting of the Empire State Building in 1964. 'The Empire State Building is a star', Warhol declared in his characteristic deadpan fashion, and for most of the film, the building literally is the star, continuously visible for over seven hours in an unmoving frame. Around 2.00 am the floodlights are switched off, and the last forty-five minutes of the film are almost totally black. In an interview in 1975, Warhol commented:

> The best, most temporal way of making a building that I ever heard of is by making it with light. The Fascists did a lot of this 'light architecture'.
> If you build buildings with lights outside, you can make them indefinite, and then when you're through with using them you shut the lights off and they disappear. (Quoted in Angel 1994: 15) [13]

Lights enables modern skyscrapers, clad with glass curtain walls, to assume dazzling, indefinite forms, and then, finally, to disappear, as if their monumental forms are no more than a conjuror's trick. The extension of electrical illumination, from individual structures to selected blocks and 'great white ways', and finally to the entire city created a whole whose impact vastly exceeded the sum of its individual parts. Electrical lighting provided the means through which the complexity of the modern city could be edited down to a few essential sites illuminated by floodlights, or grasped from above as a simplified pattern interspersed with unimportant blanks. The possibilities for wholesale architectural substitution via lighting effects resembled the selective appropriation of the cityscape that photography had been promoting at least since its industrialization in the 1880s. Submission of urban space to what Walter Benjamin dubbed the 'selection' of the camera had generated the enormously popular genre of tourist postcards depicting urban landmarks, creating a territory of images which would increasingly help to shape the materiality of built urban form.[14] By World War I, a key cultural artefact of modern urbanity was the city skyline seen at night. By the start of World War II, what had once been mostly a hallucinatory promise capable of drawing millions of migrants and tourists had already become a familiar experience for many, transforming everyday apprehensions of urban space. In the process, deeply ingrained assumptions about the social relations of space were increasingly brought into question.

Relational space and the cinematic city

In conjunction with the proliferation of transparent and highly reflective surfaces, the ability to illuminate the cityscape in new ways introduced an important new dimension into urban design, one

which belonged to neither architecture nor sculpture as traditionally understood. What emerges in the modern city is a new environment increasingly characterised by the overlap of material and immaterial spatial regimes, as distance becomes subject to new exigencies and urban surfaces increasingly function as illuminated screens. This 'mixed reality' is an inherently dynamic and unstable environment: if appearances can shift rapidly, so can meanings.

A 1912 editorial in the New York Times underlined the impact of new communication technologies such as telephone and wireless radio on traditional spatial boundaries such as solid walls:

> All through the roar of the big city there are constantly speeding messages between people separated by vast distances and ... over housetops and even through the walls and buildings are words written by electricity. (Quoted in Kern 1983: 64)

Coupled to the impact of electrical light, many fundamental spatial parameters seemed to be shifting. In their famous 'Technical Manifesto' of 1910, the Italian Futurist painters responded to the effects of 'electricism' (one of Marinetti's prospective names for his movement) by proclaiming the abolition of space:

> Space no longer exists: the street pavement soaked by rain beneath the glare of electric lamps, becomes immensely deep and gapes to the very centre of the earth... (Reprinted in Appollonio 1973: 28)

While similar manifestos announcing the annihilation of space and time were a founding tenet of twentieth century modernist culture, the theme is perhaps more accurately described as a *recurrent* moment in the technological transformation of modern life. As Schivelbusch (1986: 10) has observed, similar narratives had emerged in the 1820s, when the invention of the steam-powered train literally changed the way that people saw and experienced the landscape. The increased speed of travel, the elevated perspective offered by embanked rail lines, and the closeting of train travellers in windowed carriages which minimized physical interaction with the landscape, all combined to alter the balance between foreground and distant elements. This tearing of the accustomed envelope of spatial continuity was widely described in terms of the 'annihilation' of time and space for several decades from the 1820s— at least until the new mode of travel was routinized, and people were able to contemplate travel at thirty miles an hour with equanimity.

Schivelbusch's work is useful here in two ways. Firstly, it can help us to understand that the discourse of the 'annihilation' of space is part of an historical cycle of rupture and recuperation which recurs throughout industrial modernity. In the first phase of this cycle, older forms of spatial continuity are emptied out and made redundant, a process which, for the most part, is grasped reactively in the language of 'annihilation'. In a second phase, intuitive and creative uses are made of the new 'discontinuity'. A key site for this process in modernity has been art, exemplified by the emergence of cubism, and new techniques of representation such as collage and montage. Here the key spatio-temporal experiences of industrial modernity—acceleration, fragmentation and simultaneity— became the subject of new forms of visual experimentation which influenced all subsequent developments in modern art.

Schivelbusch's account also implies a third phase, in which the narrative of 'annihilation' subsides as the new social experiences are subsumed into the dominant cultural ensemble. What deserves greater emphasis here is the extent to which this process of habitualization is itself dependent on a gradual paradigm shift in the social relations of space and time, as new continuities are established at a more 'abstract' level.[15]

The development of cinema is a particularly relevant point of reference in this context. Early film has been influentially described by Tom Gunning (1989) as promoting an 'aesthetic of astonishment' in which the experimental disintegration of space-time in film was an integral part of the spectator's pleasure. In the period from about 1907-1914 this diverse experimentation gradually solidified into a new set of 'continuity' rules establishing the spatio-temporal framework underlying the model of 'classical narrative cinema' that came to dominate film production. This shift altered the cadence of cinema, as it moved from a marginal cultural form to an institutionalized mass entertainment. It also opened the way for the gradual re-integration into popular culture of the radical challenge cinematic vision posed to the coherence of the modern subject. The fragmentation and re-assemblage of the visual field which the cinematic apparatus promotes brought with it a radical potential to destabilize the accustomed stability and centrality of the viewing subject. The development of an institutionalized form of narrative cinema was the means by which this potential has been subsumed into modern culture, not so much as a decentring of the self but as the basis for a heightened sense of individual autonomy and mastery. While this recuperation of cinematic form as mainstream culture is neither total nor stable, it indexes an important shift in the social relations of space and time. Narrative film has been an important means by which the modern subject has integrated the new plasticity of space and time evident in a world crossed by global flows of images and information, without fatally disturbing the narcissistic, omniscient sense of individual mastery promoted by commodity capitalism a dominant subjectivity. This dialectic of rupture and recuperation situates the constant arguments as to whether cinema is capable of revolutionizing perception, as Walter Benjamin famously prophesied, or whether it has become part of the industrial techno-culture which 'drills' the modern subject in the logic of increasingly abstract social relations of space and time. (McQuire 1998: 71-81)

The spatial relations emerging from the dynamic interactions between electric light and urban space can also be profitably understood in terms of this cycle of rupture and recuperation. In the first decades of the twentieth century, the electric city no longer provided a stable grid against which time and space could be measured in traditional terms. If electric light helped to turn the city into a promise—'bright lights, big city'— capable of drawing millions out of the countryside and across the oceans, the spatial experience of the illuminated city profoundly challenged customary understandings of place, boundary, dimension and locatedness. In doing so it crystallised one of the defining dilemmas of modernity: enhanced possibilities for individual freedom and self-expression are counterpointed by a growing sense of displacement and loss of traditional forms of identity. The historic function of city design as a map of social and political order, as well as a repository of collective memory, began to give way to a new spatial organization in which the co-ordinates of self, home and community would have to be plotted in new ways. In particular, any and every physical location now had to be reckoned in relation to its potential displacement by the activation of a circuit or the overlay of an image flow. Insofar as the illuminated city suspends historically recognisable living co-ordinates, it could function as a screen for the projection of the quintessential

modern fantasy of personal freedom to re-invent the self, a fantasy off-set for many by its price tag of increased alienation and chronic identity crisis

One of the most influential and effective ways of representing the spatial complexity of the new urban environment emerged in cinema, itself an off-shoot of the incandescent light bulb and a desire for new forms of spectacular display. If cinema has become an indelible frame for the way in which the modern city is seen, this is in no small part because we have increasingly come to experience the modern city *as* cinematic. Saying this, I don't mean simply that we experience the city as an *image*, a surface without material substance, but rather as a complex, dynamic space produced through the interaction of light and movement. In cinema, the pleasures and confusions of the modern city were intensified and put on display. The editing and systematic erasure enabled by the illuminated cityscape was paralleled in film, where the presumption of continuous spatial field gives way to a new awareness of juxtaposition, dislocation, and interpenetration. But equally, cinematic montage emerges as one of the principal techniques for re-connecting the dispersed fragments and fractured moments of the modern universe, generating new models for grasping the abstract space-time of the modern world.

This theme was influentially explored by Walter Benjamin, drawing on Georg Simmel's analysis of the psychological conditions of the modern metropolis, and Freud's work on human adaptation to battlefield shock. Benjamin (1973: 252) famously offered cinema as the historical device necessary to school the 1930s 'man in the street' in the new exigencies linking phenomena such as 'big-city traffic' to world-historical political events. Cinema's abrupt switchings, sharp juxtapositions and capacity to generate meaning from seemingly random collisions, all seemed peculiarly tailored to the staccato rhythms and spatial dispositions of urban life. If such an approach reached a formal peak in the 1920s 'city symphony' films of Walter Ruttmann, Dziga Vertov, Alberto Cavalcanti, Joris Ivens and others, a similar logic informed creative work across disciplines, including painting, architecture, photography, literature, and poetry. Artists in all these domains sought appropriate means to choreograph their heightened awareness of spatial multiplicity and temporal simultaneity through techniques of collage and montage.

The critical aspect of all these forms of cultural production was their foregrounding of spatial contingency. In comparison to the integral spatial envelope which dominated the classical world and its key visual forms such as the geometric perspective of European oil painting, modern spatiality loses its submission to a stable centred point of view. Once rendered dependent on individual points of view — or, as Albert Einstein famously put it, the observer's frame of reference — space is increasingly experienced as a relative rather than absolute value. Relational space lacks integral qualities. Its properties are contingent rather fixed, dependent on a complex of unstable and shifting relations measured by statistical probability rather than precisely defined co-ordinates. Relational space is exemplified by the ephemeral Brownian motion of anonymous city crowds whose tidal movements became the hallmark of big city life.

By the first decades of the twentieth century, the absolute values of space and time which defined the Newtonian universe had already been dethroned in physics by quantum mechanics and relativity theory. The electrification of the city, in conjunction with the deployment of new media such as cinema, telephony and radio, were perhaps the most spectacular manifestation of a parallel

dislocation of the *social* relations of space and time. In fact, this kinship can be pushed further to argue that the electrification of urban lighting is an integral part of the creation of modern media environments.

Long ago Gaston Bachelard reminded us that: 'Everything which casts a light sees'. (Quoted in Schivelbusch 1988: 96) What I have suggested here is that electric lighting, with its unprecedented intensity, precision and automated control, set in motion a complex psychogeography of seeing and being seen which has become integral to the contemporary cityscape of promiscuous display and everyday voyeurism. The extension of electric lighting created the foundations for the camera-laden city of postmodernity, with its ubiquitous circuits of surveillance and counter-surveillance, but also established experimental zones of space creation foreshadowing the mutual commerce of lighting, electronic media and urbanism in the present. As we witness the current widespread deployment of sophisticated systems of computerized lighting and visual projection, the proliferation of giant screen televisions in shopping malls and public squares, and the development of 'smart buildings' which eschew the modernist glass wall for screen walls capable of chameleon shifts, we are once again becoming conscious of significant redefinitions in the ambiance of urban space.[16] What remains to be seen whether this new phase of 'rupture' further extends the dominance of commodified space in the contemporary cityscape, or, in the gap created by the disturbance of existing spatial dispositions, opens it to a new political critique.

References

Angel, C. (ed.) (1994), *The Films of Andy Warhol: Part II*, New York, Whitney Museum of American Art.

Appollonio, U. (ed.) (1973), *Futurist Manifestos* (trans. R. Brain et al), London, Thames and Hudson.

Asendorf, C. (1993), *Batteries of Life: on the history of things and their perception in modernity* (trans. D. Reneau), Berkeley: University of California Press.

Bazerman, C. (1999), *The Languages of Edison's Light*, Cambridge, MA and London, The MIT Press.

Benjamin, W. (1973), *Illuminations* (trans. H. Zohn), London, Fontana.

Benjamin, W. (1973), *Charles Baudelaire: A Lyric Poet in an Era of High Capitalism* (trans. H Zohn), London, NLB.

Le Corbusier (1964 ; originally 1935)*The Radiant City: Elements of a Doctrine of Urbanism to be used as the basis of our Machine-Age Civilization,* (trans P. Knight, E. Levieux and D Coltman), The Orion Press, New York.

Eisenstein, S. (1963), *The Film Sense* (trans. J. Leyda), London, Faber and Faber

Freud S, (1955), 'The "Uncanny"' (1919) in *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (trans. under the general editorship of J. Strachey) vol. XVII, London, The Hogarth Press and the Institute of Psychoanalysis, 1955, pp. 219-252.

Gunning, T. (1989), 'An aesthetic of astonishment: early film and the (in)credulous spectator', *Art & Text* 34: 31-45.

von Harbou, T. (no date), *Metropolis*, London, The Reader's Library.

Kenner, H. (1975), *A Homemade World: The America Modernist Writers*, New York, Morrow, p. 5.
Kern, S. (1983), *The Culture of Time and Space 1880-1918*, Cambridge, MA, Harvard University Press.
Koolhaas, R. (1994), *Delirious New York: A Retroactive Manifesto for Manhattan*, Rotterdam, 010 Publishers.
Lash, S. (1994) 'Reflexivity and its Doubles: Structure, Aesthetics, Community' in Ulrich Beck, Anthony Giddens and Scott Lash *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*, Oxford, Polity, pp. 110-173.
Lenin*, Collected Works*, vol. 31, Moscow, Foreign Languages Publishing House.

Lozano-Hemmer, R. (ed.) (2000) *Vectorial Elevation: Relational Architecture No.4*, Mexico, City, Conaculta Press.
McQuire, S. (1997), 'The Uncanny Home', *Paradoxa: Studies in World Literary Genres* vol. 3, no. 3-4, pp. 527-538.
McQuire, S. (1998), *Visions of Modernity: Representation, Memory, Time and Space in the Age of the Camera*, London, Sage.
Marx, L. (1965) *The Machine in the Garden: Technology and the Pastoral Ideal in America,* Oxford University Press.
Morus, I. (1998) *Frankenstein's Children: Electricity, Exhibition and Experiment in Early Nineteenth Century* London, Princeton, NJ, Princeton, University Press.
Nye, D. (1990) *Electrifying America: Social Meanings of New Technology 1880-1940,* Cambridge, Mass and London, MIT Press.
Nye, D. (1994) *American Technological Sublime*, Cambridge, Mass., MIT Press.
Nye, D. (1997) *Narratives and Spaces: Technology and the Construction of American Culture*, Exeter, University of Exeter Press.
Platt, H. (1991), *The Electric City: Energy and the Growth of the Chicago Area, 1880-1930*, Chicago and London, University of Chicago Press.
Ranaulo, G. *Light Architecture: New Edge City*, Basel and Boston, Birkhäuser.
Riley, T. (1995), *Light Construction*, New York, Museum of Modern Art.
Robinson, C. and Bletter, R. (1975) *Skyscraper Style: Art Deco New York*, Oxford University Press.
Schivelbusch, W. (1986) *The Railway Journey: The Industrialization of Time and Space in the Nineteenth Century*, Berkeley, University of California Press.
Schivelbusch, W. (1988), *Disenchanted Night: The Industrialization of Light in the Nineteenth Century* (trans. A. Davies), Berg, Oxford.
Schor, N. '*Cartes Postales*: Representing Paris 1900', *Critical Inquiry*, 18 (Winter 1992).
Woroszylski, W. (1971), *The Life of Mayakovsky* (trans. B. Taborski), New York, Orion.
Zizek, S. (1992), *Looking Awry: An introduction to Jacques Lacan through popular culture*, Cambridge, MA, MIT Press.

Endnotes

[1] Goethe quoted in Asendorf (1993: 153); Lenin' statement 'Communism is Soviet power plus the electrification of the whole country' was made in 1920 and reprinted in Lenin (1966); Warhol quoted in Angel (1994: 15.

[2] The notable exceptions are historians David Nye (1990, 1994) and Wolfgang Schivelbusch (1988), although Schivelbusch's main focus is gas rather than electric lighting.

[3] This excess over and above any pure functionality was already apparent in the earlier generation of public experiments with electricity conducted by those such as Sturgeon and Saxon in London in the 1830s. Morus (1998) has emphasized the spectacular nature of their displays, concluding that the creation of special effects such as giant sparks was an indispensable element not only in attracting public attention but in winning the battle of public opinion.

[4] Nye (1990:29) discusses this plan published in *Electrical World*. Schivelbusch (1988:3-5) discusses a similar proposal by architect Jules Bourdais to erect a 360m tower near the Point-Neuf with arc-lights strong enough to illuminate the entire centre of Paris, noting that it was one of the final two projects considered for the celebration of the centenary of the French revolution. It eventually lost out to another engineering triumph, Gustave Eiffel's tower.

[5] The first demonstrations of the Lumière brothers'pioneering *cinematographe* at the Grand Café in Paris included the now famous short film, *L'arrivée d'un Train en Gare La Ciotat*, showing a train pulling up to the station platform. For years, the tale of the audience fleeing this apparition were widely circulated, and served to prove both the traumatic realism of the new medium and the credulity of the early audience. While more recent scholarship is agnostic as to the factual basis of these accounts, I would argue they can be profitably read as indexes of the revolution in the social relations of representation that the new medium produced.

[6] A good account of these common phases for the spread of electrification is found in Platt's (1991) economic history of the electrification of Chicago. While electrification of the world's major cities began in the 1880s and was an established fact by World War I, the electrification of regional cities, like the extension of power to rural areas, was a much slower and more uneven process.

[7] Schivelbusch (1988: 83-99) discusses the origins of public lighting schemes in Europe in the sixteenth century and their linkage to the extension of the Absolutist state which controlled an enormous amount of people's daily routine. During the various nineteenth century rebellions in Paris (1830, 1848, 1871), lantern smashing constituted a collective act of rebellion against state authority. While I am not concentrating on the relation between lighting and the policing of public space here, it is important to recognize that the light retains a major role in the imposition of social order, demonstrated by the chaos following black-outs such as those which affected New York in 1974.

[8] The World's Fairs also played a critical role in securing venture capital to finance the development of electrical technology and the roll-out of electrical infrastructure. Bazerman (1999) provides a detailed account of Edison's machinations in relation to the major fairs of the 1880s, which included payments to key members of the technical juries evaluating competing electrical systems, as well as the more conventional techniques of modern public relations.

[9] On the electrification of factories in the United States, see 'The Flexible Factory' in Nye (1994: 185-237).

[10] While World's Fairs and similar exhibitions were not profitable in themselves, the National Electric Light Association in the US noted their value as 'load builders' instrumental in increasing demand for street lighting and other uses of power.

[11] On the relation of the uncanny to space and architecture, see also McQuire (1997).
[12] According to Lang, his film was itself originally inspired by a visit to New York: 'I first came to America briefly in 1924 and it made a great impression on me. The first evening, when we arrived, we were still enemy aliens so we couldn't leave the ship. It was docked somewhere on the West Side of New York. I looked into the streets — the glaring lights and the tall buildings — and there I conceived *Metropolis'*.
[13] The reference to 'the fascists' is probably to Albert Speer's radical use of dozens of searchlights pointed vertically into the night sky to construct a vast stadium of light for Hitler's rallies.
[14] See for example Schor, (1992).
[15] It is important to appreciate that these three 'phases' I am describing are overlapping rather than linear, and that 'abstract' is a relative term, referring in particular to the emergence of the reflexive subjectivity conditioned by the heightened role of media and communication technologies in everyday life. See, for example, Scott Lash (1994: 110-173).
[16] Interactions between light, new media, architecture and urban design have been the subject of increasing attention in the last decade. See, for instance, Riley (1995), Lozano-Hemmer (2000) and Ranaulo (2001).

Author/s:
MCQUIRE, SCOTT

Title:
Immaterial architectures: urban space and electric light

Date:
2005

Citation:
McQuire, S. (2005). Immaterial architectures: urban space and electric light. Space and Culture, 8(2), 126-140.

Publication Status:
Published