Revolutionary Climatology:
Rings of Saturn, Ringed by Red Lightning
Sarah K. Stanley

Reveal to these depraved, O Republic, by foiling their plots, your great Medusa face, ringed by red lightning. (Workers' song, 1850)[1]

Introduction
Walter Benjamin recognised that architecture and technical media taken together were capable of generating a new materialism. Benjamin saw the arcades as a form of infrastructure, consisting of a glass iron structure set atop the narrow passageway between dwellings. It was literally a street transformed into an interior, selling products destined for domestic interiors and the fashions that people wore while parading in public. The arcades were no longer fashionable by the time Benjamin arrived in Paris; many had been destroyed during the Haussmann renovation. The structures had begun to show the edges of ruination as an outmoded form, just as media archaeology seeks out the dead ends of technological history.[2] It was only a failed architecture that could become the object of study for an historical materialist.

Benjamin elaborated his concept of historical materialism in his last work, 'On the Concept of History', explaining how it involves learning from the tradition of the oppressed and the emergency situation that had become the rule.[3] Benjamin's practice of historical materialism becomes a media archaeology activated through literary montage and photo philosophy. He elaborated cues from a range of architectural sources. Foremost, he redeploys

Sigfried Giedion and Laszlo Moholy-Nagy's *Building in France* within *The Arcades Project* drawing upon not only its content, but also its layout design.[4] The layered reassembling of the book's graphic and textual elements becomes a media environment, rather than a mass of quotations, as *The Arcades Project* is often dismissed. Benjamin's unique contribution is the multiplying of sources by choosing highly charged passages closer to image than historical writing. With this in mind, the methodical indexing and cross-referencing of the citations from hundreds of sources contains the potential for a proto-electronic archive. It becomes possible to uncover the 'primal history' of nineteenth century architecture that lay beneath narrative by unfolding smaller variegated facets of the historical text.

Media archaeologist of the arcades
Central to Benjamin's mode of writing are his site-specific diagrams outlined in 'A Berlin Chronicle'.[5] Benjamin's encounter with architectural theory of the early 1920s (Giedion, Moholy-Nagy, *G* Magazine) sparked his interest in industrial architecture, including how the structures appeared in photographs. The genesis for *The Arcades Project* was the literary work *Le Paysan de Paris* by Louis Aragon, and its mode of literary and graphic montage.[6] The book contained a photograph of the Passage de l'Opéra, one of the earliest glass-covered passageways that had become the meeting place chosen by Aragon for the gatherings of Dada. Also influential to Benjamin's methods must have

been Karl Kraus's satirical-literary techniques using a *détournement* of quotations.[7] Literary montage transforms text into a medium closer to cinema, and maybe even to the weather, considering Benjamin's frequent references to rain, sky, clouds, atmospheres, auras, air, breath and breathing, gas lighting and lightning storms.

Benjamin's writing takes a literary, autobiographical turn after he joins the editorial meetings of *G* magazine in 1923, and starts writing for newspapers on a regular basis. He writes the first drafts of 'One-Way Street' using sections of letters he had written in 1923, published in 1928.[8] These experiments lead him to develop the revised method of scholarly research that he undertakes in *The Arcades Project*.[9] What had begun as the usual routine of writing outlines and collecting research materials eventually evolved into an archival project. What distinguishes *The Arcades Project* is that the collections of quotations were longer and more extensive, and sorted under broader themes, than ever would be undertaken for a single book project. He had become a future librarian of the highly fragmented circulation of textual passages that half a century later has become the underlying logic of the Internet. Without academic affiliation, Benjamin spent a good portion of his time in the library, an architecture of information and indexing technologies. The Bibliothèque nationale in Paris (1868) contained some the most innovative uses of lightweight iron construction, combined with the first interior gas lighting and glass oculi. During long hours of copying out notes, it is likely Benjamin absorbed the technical systems of both the architecture and informational systems as methodological resources.

Very few of the many publications about *The Arcades Project* focus upon architecture, perhaps because Benjamin sought to rework the traditional schemes of architectural history, paying little or no attention to architects or their buildings. Detlef Mertins, in his essay 'Walter Benjamin and the Tectonic Unconscious', discusses how Benjamin changes Sigfried Giedion's *Building in France* 'into optical instruments for glimpsing a space interwoven with unconsciousness'.[10] Mertins downplays Giedion's engagement with film and photography already intrinsic to *Building in France*, designed by Moholy-Nagy, foremost film and photo theorist. Eve Blau has argued that Giedion's use of images (still and moving) in his publications explore 'duration and immanence', and the images are relational rather than determinate.[11] Nevertheless, Benjamin's theory of the optical unconscious applied to tectonics does evoke media archaeology as a nonhuman world made visible. This can be seen most clearly in his preference for gas lighting, discussed further on. As will be made clear in the following discussion of Benjamin's photo philosophy, he never emphasised visuality for its own sake, since he had been tutored by German artists who had absorbed Soviet Constructivism.[12]

Benjamin studied *Building in France* for its content and imagery, yet most crucial was the design by which the information is presented. Similar to *The Arcades Project*, sections of *Building in France* make use of long strings of direct quotations, introduced as 'instead of derivations, some voices from various moments of the period.'[13] The entries resort to the same type of punctuated language that Benjamin favours in his choice of passages. For instance, the encyclopaedic sounding 'Henri LABROUSTE (1801–75). Attempts for the first time to combine engineer and architect in one person: architect-constructor.'[14] Giedion adds very little analysis or commentary in much of the book, the exact method that Benjamin decides to utilise for his own decade long project. *Building in France*'s design reflects the functional clarity of the new architecture through a parallel information architecture, which Benjamin recognised.

Never before was the criterion of the minimal so important […] the minimal element of quantity: the 'little', the 'few.' These are dimensions that were well established in technological and architectural constructions long before literature made bold to adapt them.[15]

Benjamin was motivated to transform knowledge production generated by the printed book. 'The book is already an outdated mediation between two different filing systems', he wrote.[16] An archaeological method is laid out in 'A Berlin Chronicle' (1931): 'He must not be afraid to return again and again to the same matter; to scatter it as one scatters earth, to turn it over as one turns over soil. For the matter itself is only a stratum.'[17] These earthen excavations were the 'so many thousand printed characters run through the fingers' every week at the library, the physical act of opening hundreds of printed books to scavenge a few lines. 'Rather than attempt a historical account of this process, we would like to focus some scattered reflections on a small vignette which has been extracted from the middle of the century (as from the middle of the thick book that contains it)'.[18] Other references to archaeology abound throughout the volume, such as methods for dislodging the episteme out of its shell. 'If the object of history is to be blasted out of the continuum of historical succession, that is because its monadological structure demands it.'[19] The practice of media archaeology often evokes the nonhuman, the point at which media itself are capable of cutting loose epistemic objects.[20]

Benjamin's reception of photography is crucial to his engagement with *Building in France*.[21] The ways Benjamin references photographs in *The Arcades Project* are linked directly into Giedion's cache of images. Just as photography disrupted the very terms of artistic engagement through its technical character, a similar operational change was underway within architecture. Along these lines, *The Arcades Project* explores the media that emerge from within architectural structures and infrastructure, rather than as simple representation, which is the equivalent of the façade. Architectural media emerge from the glassed passageways in 1820, the same time period photography is invented and gas lighting is first introduced into interiors. Likewise, the photographic exposure imparted to metal and stone is an animation of the material world that cinema would further accelerate. 'These stones were the bread of my imagination', Benjamin wrote in his essay on Marseilles, which aligned his thinking more with primitive architecture than modernism.[22]

Architects were writing books and publishing magazines that brought together industrial structures and technical equipment through photographic layouts. Moholy-Nagy's numerous publications drew from Berlin Dada and De Stijl, as well as from Le Corbusier's graphic design created for *L'Esprit Nouveau*.[23] His first book *Buch Neuer Künstler* (1922) followed Le Corbusier's method of juxtaposing machine technology with works of art or design. In one illustration, the metal engineering structures of a bridge is presented with the Constructivist art of El Lissitsky.[24] Photography and film were central to Giedion's revised historical methods, while as an artist, Moholy-Nagy was engaged in making films from animated storyboards freely mixing graphic elements, photographs and text. [fig. 1]

Benjamin's encounter with Dada artists and Bataille, known for their dictionary entries and creation of encyclopaedias, may have led to his development of the alphabetical ordering system. 'The father of Surrealism was Dada; its mother was an arcade.'[25] 'This work has to develop to the highest degree the art of citing without quotation marks. Its theory is intimately related to that of montage.'[26] By adopting the cutting skills of the film editor, Benjamin broke apart the older printed media, making the text into an 'image' ready for swifter

modes of search and retrieval. *The Arcades Project* calibrates a new method of information retrieval through an indexical code assigned to each block of text that could then be cross-referenced. This shift into paratextual devices and epigrams prefigures the linking of text via hypertext markup language (html).[27] These passages could potentially multiply from their bound books, communicating automatically without a human narrator. 'How gratings – as allegories – have their place in hell.'[28] This liberated lexicon orchestrates a media archaeology that has only just begun to be realised on digital platforms, what Proust intends with the experimental rearrangement of furniture.[29]

The so-called 'Exposés' written as the sole commentary to *The Arcades Project* contain an outline for a media archaeological praxis. 'The historian today has only to erect a slender but sturdy scaffolding – a philosophic structure – in order to draw the most vital aspects of the past into his net.'[30] Engels studies the tactics of barricade fighting; Benjamin appropriates architectural theory to rework the Marxist tactics of historical materialism. He considered Alfred Gotthold Meyer's tectonic theory published as *Eisenbauten* (iron constructions) in 1907 as a prototype for materialist historiography. Meyer is critical of the Berlin tectonic school inaugurated by Schinkel, which had sought to apply the same architectonics used in stone and wood for iron construction.[31] Benjamin refers repeatedly to Sigfried Giedion's photo of Pont Transbordeur spanning the industrial harbour in Marseilles, built by Ferdinand Amodin in 1905. In the steel supports of a transporter bridge, Benjamin identifies the thin net and streaming as its fundamental qualities: 'through the thin net of iron that hangs suspended in the air, things stream – ships, ocean, houses, masts, landscape, harbour.'[32] Similarly, indexical systems rather than chapters opened passageways to be read more fluidly.

All photographs did not hold the same value for Benjamin. He often quoted Brecht about how the information presented by photography can also mislead, and that this must be made explicit. 'Reality proper has slipped into the functional. The reification of human relationships, the factory, let's say, no longer reveals these relationships. Therefore something has actually to be constructed, something artificial, something set up.'[33] Constructivist photography is fully operational in *Building in France*. Most other photographs of the Eiffel Tower emphasise its height and placement in the landscape, while Moholy-Nagy's photographs in the book were taken from within the structure, looking up from below into the meshwork of multiple points and angles. This presents a vertiginous volume of interpenetrating lines that emphasise the tower's capacity to transmit electrical signals (for radio and TV). [fig. 2]

Prefabricated parts assembled on site reduced the labour and human interaction required. 'Each of the twelve thousand metal fittings, each of the two and a half million rivets, is machined to the millimetre […]. On this work site, […] thought reigns over muscle power, which it transmits via cranes and secure scaffolding.'[34] Clearly the ironworks that comprise its frame were crafted with more than functional requirements in mind, yet despite this Gustave Eiffel stressed its engineering and scientific uses. The optics develop less from the views seen from the actual structure than its constant presence felt in every part of the city.[35] It organises the way other urban architecture becomes visible, just as the Paris arcades caused new passageways to open in the middle of the city. Prior to the construction of the arcades, no safe, sheltered pedestrian walkway existed on the street.

Moholy-Nagy also had been drawn into photography by its technical-reproductive capacities, similar to the possibilities of a new architecture based upon methods of fabrication. Much like Benjamin in

Fig. 1: Dynamik der Gross-Stadt (Dynamic of the Metropolis), Laszlo Moholy-Nagy in *Malerei, Fotografie, Film* (1925), 122–137.

'A Short History of Photography' and 'The Work of Art in the Age of Its Technological Reproducibility', Moholy-Nagy saw the limitations of photography as the reproduction of innumerable images but without the capacity to reveal social conditions.[36] His call for a new photography in his 1922 essay 'Produktion-Reproduktion' is now well-known: 'we must endeavour to expand the apparatus […] used solely for purposes of reproduction for productive purposes.'[37] Moholy-Nagy's productive aims share the qualities that Benjamin ascribed to the optical unconscious, to expose social conditions that otherwise remained hidden. Benjamin quotes Brecht in 'A Short History of Photography', saying that the present situation is 'complicated by the fact that less than at any time does a simple reproduction of reality tell us anything about reality. A photograph of the Krupp works or GEC yields almost nothing about these institutions.'[38] The slave labour used by Krupp during World War II is now widely documented through court testimony, a shocking exposé compared with the large archive of company photographs that feature heroic steel armaments prepared for promotional purposes.

In 'Saturn's Ring, Notes on Iron Construction', the only essay on *The Arcades Project* prepared for publication, Benjamin emphasised outmoded media: 'The arcades are the scene of the first gas lighting.'[39] His sensibilities are made clear when he expresses regret over the changeover from gas lamps to electric lights: 'The old gas torches that burned in the open air often had a flame in the shape of a butterfly, and were known accordingly as papillons.'[40] These butterfly lights, the flame resembling fluttering wings, were demonstrated almost on command in the newspaper offices in *Citizen Kane*.[41] Kane steps up onto a chair to adjust the brightness of the gas flames as he examines the final daily news proofs, a fitting tribute to Walter Benjamin's own forays as a journalist and storyteller for radio. Cinema was only made possible with electricity, yet the arcades presented a proto-cinema with its gas and overhead lighting.

The methods employed in producing *The Arcades Project* were continuations of insights Benjamin had gained through writing and research. His discovery of the relaying of practice into theory was first realised through drawn diagrams. In 'A Berlin Chronicle' Benjamin asks some questions about his past, and answers become inscribed: 'to open the fan of memory never comes to the end of its segments, only in its folds does the truth reside, that image, that taste, that touch'.[42] Automatic writing favoured by the Surrealists played a part, yet Benjamin describes the use of diagrams to organise and even produce the writing. He explains how he carried a sheet that contains a diagram drawn while sitting in a café in Paris, eventually lost, but later the schema was recalled while writing about Berlin. He writes a chronicle of his life in Berlin through the diagram's way-finding, much like his first experimental writing. 'One-Way Street' is a compilation of urban sites orchestrated with large title headings that read like advertisements, or diagrams.

Underground works: excavations in progress
The diagram Benjamin describes is a series of branching trees, outlining a genealogy of his ideas as connections to other literary works (what would later be called intertextuality). The diagram brings together relations to other texts and interactions that then form passages, a method to transcribe events that merge memory, sensations and urban sites.

Underplaying personal relationships in favour of nonhuman ones he notes, 'the veil that gets covertly woven over our lives shows people less than the sites of our encounters'. Benjamin's attention to the nonhuman contributed to his practice of historical materialism in *The Arcades Project* in ways that also develop in his urban writing.[43] He speaks of insights appearing to him 'with the force of illumination'. He

Fig. 2: Eiffel Tower with Lightning, 1900. Source: Wikimedia Commons

Fig. 3:   Bibliothèque nationale, (Henri Labrouste 1868), photo: Georges Fessy.

Fig. 4:   Interior 1, Plantings, State Library Kulturforum (Hans Scharoun), 2015, photo: author.

attributes the premise of sudden awakening to the constellation of things that make their appearance on the streets of Paris, the walls and quays, the places he had paused, the collections and rubbish, the railings and the squares, the arcades and kiosks. Primary in this mode of writing was the importance of entering into the flow of events without explaining how or why they happened. Benjamin uses the example of how Herodotus prefaces a story by noting that a very wonderful thing is said to have happened.[44] A well-known example is the story of Arion the renowned harp player who was saved by a dolphin after being forced by bandits to jump into the ocean. This was another way of supporting the marvellous of the everyday important to Surrealist literary interventions.

In 'A Berlin Chronicle', Benjamin's recalls a charged site: as a young man, he looked into the glass-enclosed bar at an Ice Palace owned by his father. Although unable to speak with her, he gazes at a woman dressed in a tight sailor suit. He describes the memory as an intense sexual awakening of transgendered desire. In another instance, he has forgotten the address to the Synagogue or got lost on his way, yet feels with a great force the sudden liberation from family duty. The scene is only remembered through the use of a diagram, an immense pleasure at letting things take their course, and the process of transforming relations with his surroundings. 'Diagrams must be conceived as Hammers and Songs.'[45] This mode of writing becomes a tool for excavating urban sites through metal and stone structures (architecture) and signage (advertisements). Benjamin writes in 'One-Way Street', 'What makes advertisement superior to criticism? Not what the moving red neon says – but the fiery pool reflecting it in the asphalt.'[46]

Benjamin continually downplays language in favour of affective images closer to cinema. Neon lighting was invented in Paris with the first neon signs appearing in 1910 produced by a gaseous liquid that Benjamin preferred to electrical lighting. A neon sign on the side of a building spelling out 'Amour' in red, illustrating neon in a book, shows how photography captures these atmospheric effects. For Benjamin, sites are mapped through his interaction with the media found on streets, nonhuman worlds that only emerge through a wilful 'letting go' of human volition. These writing modalities Benjamin outlined as a diagram contribute to the marking out of sites as intensive encounters, which were erotically charged to varying degrees.

To the public: please protect these new plantings

The atmosphere of the surrounding environment is frequently evoked in *The Arcades Project*, often through Benjamin's own immediate situation in architecture. In libraries for example, Benjamin pursued his project beneath the ornamented vaulting of the reading room of the Bibliothèque nationale in Paris, and 'the glassed-in spot' facing his seat at the Staatsbibliothek in Berlin: [figs. 3–4]

> These notes devoted to the Paris arcades were begun under an open sky of cloudless blue that arched above the foliage; millions of leaves, the breath of the researcher, the storm, the idle wind of curiosity, covered with the dust of centuries. For the painted sky of summer that looks down from the arcades in the reading room of the Bibliothèque nationale in Paris has spread out over them its dreamy, unlit ceiling.[47]

He asks, 'What is "solved"? Do not all the questions of our lives, as we live, remain behind us like foliage obstructing our view?'[48] The second floor of Berlin's State Library contains a large installation of plants and trees. The ceiling is lined with large skylights, ocular lenses shaped like the round pores of plants, while a long glass wall extends along the entire length of the library. It is a long building, much like the ones Fourier had envisioned for social housing. The interior contains an open plan space with few barriers and open decks that float above

Fig. 5: Interior 1, Purple Haze, State Library Kulturforum (Hans Scharoun), 2015, photo: author.

the ground, illuminated from all directions. During the day, natural light enters from the rows of ocular portals that cover the entire ceiling, and at dusk, the darkening purple sky presses its atmospheric light against the three storey glass wall. [fig. 5]

The aura that Benjamin defined was much vaster than any surrounding a single work of art. It was closer to an atmosphere.[49] It was the organisation of the senses in an urban corridor, a series of events unfolding in the landscape, the far-off mountain range, mediated by passing clouds, the branch of a tree. Glass architecture appears first in a photomontage, a medium that created fluid relations between the older stone architecture and industrial materials that appear as an environment. As for the new architecture, it appears like a storm in Mies van der Rohe's Glass Skyscraper Project (1922), blowing the wreckage of history into a single towering glass wedge. It rises on the skyline as climate, and reappears in 1950s midtown Manhattan generated by capital flows related to the sale of luxury products, the same immaterial systems of wealth that had drawn Benjamin to study shopping arcades. 'With the destabilising of the market economy, we begin to recognise the monuments of the bourgeoisie as ruins even before they have crumbled.'[50] Although Benjamin mostly certainly knew of Mies van der Rohe through both their associations with *G* magazine in Berlin in the 1920s, he never mentions the architect or his work, yet does make references to Le Corbusier's urban writing, never his architecture. This is no doubt due to his deliberate neglect of the so-called victors of traditional historical writing.

Benjamin's choice of research subject during his exile follows the troubled Germany economy. By 1935, the German economy was geared solely towards massive public works projects in order to finance the printing of money to break free from its debt obligations. Benjamin chose the subject of iron construction, the same iron and steel works so crucial to German military rearmament. Benjamin would have become aware by 1931 when the news broke that Germany had been secretly remilitarising, organised through industrialists like Krupp who constructed Hitler's war machine and ensured his political power. It was begun as a strategy to force the French and British national banks to end the heavy debt burden imposed after the First World War, yet the tragic outcomes still reverberate today. During the Second World War the iron and steel industries would utilise prison labour from concentration camps, an extreme case of worker exploitation within capitalist production. Benjamin reveals his political project in *The Arcades Project* to be class struggle that results in ecological devastation. 'The later conception of [human] exploitation of nature re-enacts the actual exploitation of [humans] by owners of the means of production. If the integration of the technological into social life failed, the fault remains in this exploitation.'[51]

In *The Arcades Project*, the research is concerned with the genealogy of tectonics. Housing reform in 1920s Berlin had produced a vast new housing stock using long rows of prefabricated buildings. The *Siedlungs* or housing estates, created during the Weimar Republic using new financing schemes, had a close relation with Fourier's elongated communal structures, yet this goes unmentioned.[52] Instead, Benjamin notes that locomotives required iron tracks, while the rail then becomes the first prefabricated iron component, the precursor of the girder. He then notes, 'iron is avoided in home construction but used in arcades, exhibition halls, train stations – buildings that serve transitory purposes.'[53] The sites were passageways, streets and bridges. Architecture becomes fluid as is suggested at numerous points in *The Arcades Project*, just as the liquidation of the interior took place during the last years of the nineteenth century, in the work of Jugendstil.

The nearest stop to Benjamin and Hegel's University of Berlin is Friedrichstrasse Station, the stop prior to the Hauptbahnhof (Central Station). The newer brick façade dates from 1950, but the covering over the platform dates from 1927. The station requires walking down one level that contains shops and cafes, and walking up again using an escalator. Compared with the Hauptbahnhof, the roof is a heavier metal structure with pitched roof and yellowing opaque panels of glass. Today, travelling by train from Berlin Hauptbahnhof south towards Frankfurt is to follow the route Benjamin travelled to the University of Frankfurt in 1928, in a final attempt to find support for his dissertation, and to Paris in 1933, fleeing Berlin.

Siegfried Giedion notes in *Building in France*, 'the artistic draperies and wall-hangings of the previous century have come to seem musty.'[54] Likewise, the train platforms are covered by the rounded glass ceilings that resemble curtains or woven textile. The Hauptbahnhof is a new station with a wide spanned glass ceiling that covers a four storey shopping arcade. The plan for the modern arcades has expanded to include the train station platform and shops, a common design feature in Berlin and elsewhere in many cities.

The glass shell roofs that now cover rail terminals no longer require structural supports, yet still use the small panes of glass in order to make a curved expanse – large pieces of glass do not bend. Upon arriving at the Hauptbahnhof platform, the wide glass ceiling is a net stretching from one side of the large building to the other. It offers 'a wide angle lens' that allows a peering out at once to sides of the street and the full expanse of sky. A photo taken of the glass canopy appears in the small rectangular screen the size of a celluloid negative, while the lifesize digital camera advertisement on the platform promotes the camera's nonhuman eye. The sweeping glass arcade roof infrastructure matches the latest high-speed digital cameras, even while some of the freight trains passing through are from another era altogether.

Revolutionary climatology

> For over 100 years, anecdotal reports have appeared in the scientific literature describing brief luminous glows high above thunderstorms. They were given little more credence than UFO sightings until 1989, when university researchers accidentally captured a 'red sprite' on a lowlight video camera. Red Lightning Sprites are now known to flicker like transient, phantasmagoric auroras in the mesosphere, at the very edge of space, whenever unusually powerful lightning flashes within storms far below.[55]

More than architecture, *The Arcades Project* reports on the weather. [fig. 6] Arcades share a genealogy with planetariums, star-gazing architectures, and also with greenhouses. Scientists did not believe Red Lightning Sprites existed, until it was registered on infrared video. Meanwhile, the cause of lightning itself still remains a mystery. What is known is that lightning and all its related displays are intrinsic to the functioning of the earth's weather systems, such as rainfall and heat distribution. 'Or Goethe: how he managed to illuminate the weather in his meteorological studies, so that one is tempted to say he undertook this work solely in order to be able to integrate even the weather into his waking, creative life.'[56] *The Arcades Project* was written as a literary way-finding system, in order to gain access to what Benjamin called the constellation of awakening. *The Arcades Project* presents an infernal archive, a would-be guide and manual to generate dialectical images, to awaken from the internalised mythologies of capitalism.

Dialectical images cluster momentarily; the subtractive powers of media evaporates language in a hum of electrical impulses. Light/ning is the

electrified plasma or neon tube lighting. Red Sprites become a charged image of weather systems at the intersection of electrical and electro-magnetic forces. 'His nerves had become so sensitive to atmospheric electricity that an approaching thunderstorm would send its signal over them as if over electrical wires.'[57] To watch a filmed recording of lightning seeking to make contact on the ground, it extends what is called a stepped leader, or jagged bolt that must connect with a similar line extending upward. On earth, the lightning frequency is approximately 40–50 times a second or nearly 1.4 billion flashes per year. Taken together, a cosmic neuronal system flashes into view for a brief second.

Other technical media, namely lighting and photography, activate the arcades as media compared with the darkened enclosures of nineteenth century interiors. The protected passageways provide shelter from inclement weather while the gas lighting and sunlight exhibit climatic conditions. Benjamin's own sensitivity to climate was evident. 'Are we not touched by the same breath of air which was among that which came before?'[58] In 'On the Concept of History' Benjamin quotes Fourier, one of the iconic figures of *The Arcades Project*:

> According to Fourier, a beneficent division of social labor would have the following consequences: four moons would illuminate the night sky; ice would be removed from the polar cap; saltwater from the sea would no longer taste salty; and wild beasts would enter into the service of human beings. All this illustrates a labor which, far from exploiting nature, is instead capable of delivering creations.[59]

In the fields with which we are concerned knowledge exists only in lightning flashes. Sigrid Weigel elaborates upon how Benjamin's flash of knowledge operates in relation to text and image, or his concept of denkbild, or thought-image.[60] The connection between *The Arcades Project* and other writings suggests that Benjamin was testing out

how to construct a literary apparatus for producing new forms of knowledge. In his essay on Surrealism Benjamin explicitly maps out the revolutionary power of writers, and his intention to make use of what he had learned from reading them.[61] *The Arcades Project* does open large passageways into the future of the book. More than scholars, it has been artists that have attempted to make new work using the materials from *The Arcades Project*. 'Velocity, tactility, proximity – these were to be the principles of a radical new criticism. "One-Way Street" made this plain with its own distinctly metropolitan literary architectonics.'[62] It was taken up with the practice of *détournement* by the Situationist International, announced in the inaugural journal as the 'integration of present or past artistic productions into a superior construction of a milieu'.[63] There has been at least one sustained effort to generate a hypertext document using materials from *The Arcades Project*. In addition, a recently published nine hundred page book, *Capital*, claims to use *The Arcades Project* as its model for unwinding the twentieth century of New York City, covering many of the same topics found in *The Arcades Project*. It largely succeeds in becoming a literary vehicle that Benjamin had imagined for his own work.[64]

The Arcades Project organises an urban archaeology of the recent past that began with the photograph of an arcade, the Passage de l' Opéra, before moving underground: 'Nadar's superiority to his colleagues is shown by his attempt to take photographs in the Paris sewer system: for the first time, the lens was deemed capable of making discoveries.'[65]

The charged revolutionary potential of the mass actions planned for COP21 (the Paris Climate Conference) were intensified by the terror attacks just two weeks prior, confirming Benjamin's sentiment that the chaos of emergency events is the rule. Climate change and globalised terror provide a backdrop for Benjamin's own life as a refugee,

Fig. 6: Exterior 1, Test Patterns, Kulturforum (Hans Scharoun), 2015, photo: author.

living in Paris while working on *The Arcades Project* (1933–40).

Often the entries in *The Arcades Project* create a continuum between materiality and technique. The ring of Saturn becomes an iron railing, and the painted foliage on the ceilings of the Bibliothèque nationale: 'as one leafs through the pages down below, it rustles up above', when the lightning flash of dialectical imagery sends out its shock waves, the past is allowed to resurface into the present.[66] Benjamin suggests that this way of knowing always involves a 'stillstehen' or 'zero-hour': 'The read image, by which is meant the image in the now of recognizability, bears to the highest degree the stamp of the critical, dangerous moment which is at the basis of all reading.'[67]

This is how the architecture of the arcades functions in *The Arcades Project*, old media glowing from the interior of an empty mollusc shell, the natural allegory Benjamin often uses to describe nineteenth century interiors: 'arcades dot the metropolitan landscape like caves containing the fossil remains of a vanished monster: the consumer of the pre-imperial era of capitalism, the last dinosaur of Europe'.[68]

The text is the thunder rolling long afterwards.

Notes

1. Adolf Stahr, *Zwei Monate in Paris*, vol. 2, (Oldenburg, 1851):199, cited in Walter Benjamin, 'Exposé of 1935', in *The Arcades Project*, ed. Rolf Tiedemann, trans. Howard Eiland and Kevin McLaughlin (Cambridge, MA: Belknap Press/ Harvard University Press, 2002), 12. In his 'On the Concept of History', trans. Dennis Redmond ([1940] 2005) Benjamin suggests this idea of an abrupt, violent and destructive revolt, possible at any time, with incalculable consequences, accessed 30 January 2016, https://www.marxists.org/reference/archive/benjamin/1940/history.htm.

2. 'Past media are not dead, but undead, principally to be re-activated and thus in a radically present state of latency'. See Wolfgang Ernst, 'Media Method-Method and Machine' (Lecture at Anglia Ruskin University, Cambridge, 18 November, 2009), accessed 30 January 2016, https://www.medienwissenschaft.huberlin.de /de/medienwissenschaft/medientheorien/ernst-in-english.

3. Benjamin, 'On the Concept of History'.

4. Sigfried Giedion, *Building in France, Building in Iron, Building in Ferro-Concrete,* trans. J. Duncan Berry (Santa Monica, CA: The Getty Center, [1929]1995).

5. Walter Benjamin, 'A Berlin Chronicle', in *Reflections: Essays, Aphorisms, Autobiographical Writings*, trans. Edmund Jephcott (New York: Random House, 1995).

6. Louis Aragon, *Paris Peasant,* trans. and intro. Simon Watson Taylor (Boston: Exact Change, 1994), appeared in installments in La Revue européenne before being published as a single text, *Le Paysan de Paris*, in 1926. It comprises four sections: 'Preface to a Modern Mythology' (*'Préface à une mythologie moderne'*), 'The Passage de l'Opéra' (*'Le Passage de l'opéra'*), 'A Feeling for Nature at the Buttes-Chaumont' (*'Le Sentiment de la nature aux Buttes-Chaumont'*), and 'The Peasant's Dream' (*'Le Songe du paysan'*) – the last was added for the 1926 publication. Benjamin himself stated that Louis Aragon's *Le Paysan de Paris* 'stands […] at the very beginning' of the Arcades research in 'Benjamin, letter to Adorno (from Paris)', 31 May, 1935, in *Theodor W. Adorno and Walter Benjamin: The Complete Correspondence 1928–1940*, ed. Henri Lonitz, trans. Nicholas Walker (Cambridge: Polity Press, 1999), 88.

7. Walter Benjamin, 'Karl Kraus' in *Selected Writings*,

vol. 2, part 2, 1931–1934, (Cambridge, MA: Belknap Press/ Harvard University Press, [1931] 1999).

8. Walter Benjamin, 'One-Way Street' in *One-Way Street and Other Writings*, trans. J. A. Underwood (London: Penguin Classics, 2009). An epistolary novel is written as a series of documents, usually letters, although diary entries, newspaper clippings and other documents are also included. *Le Paysan de Paris* draws upon this mode of writing, and so does 'One-Way Street'.

9. Graeme Gilloch, 'Paris and the Arcades' in *Walter Benjamin: Critical Constellations* (Cambridge: Polity, 2002) provides a detailed overview of references that tie together *The Arcades Project* with Benjamin's ongoing writing production. According to Gilloch, all of Benjamin's writings from the autumn of 1927 until his death in 1940 derive from research generated by *The Arcades Project*.

10. Detlef Mertins, 'Walter Benjamin and the Tectonic Unconscious: Using Architecture as an Optical Instrument' in *The Optic of Walter Benjamin*, ed. Alex Coles (London: Black Dog Publishing, 1999), 198.

11 Eve Blau, 'Transparency and the Irreconcilable Contradictions of Modernity', *Praxis* 9 (2008), 52.

12. Mertins claims that by linking decorative architecture to the mythologies of Capitalism, industrial architecture to social revolution, Benjamin 'radicalised and politicised social conflict'. This was also the basis of Soviet Constructivism that had been an active artistic force in Berlin throughout the 1920s, often featured in *G* magazine, and that then had become the reigning ideology at the Bauhaus. See Mertins, 'Tectonic Unconscious', 197–99.

13. Giedion, *Building in France*, 94–97.

14. Ibid., 94.

15. Benjamin, *Arcades Project*, F4a,2.

16. Benjamin, *One Way Street*, 60.

17. Benjamin, 'Berlin Chronicle', 314.

18. 'Ring of Saturn or Some Remarks on Iron Construction' (1928), in Benjamin, *Arcades Project*, 885.

19. Benjamin, *Arcades Project*, N10,3.

20. 'Media archaeology is both a research method in media studies, and an aesthetics in media arts […] it denominates the nonhuman procedures which happen in media themselves.' See Ernst, 'Media Method-Method and Machine', accessed 30 January 2016, https://www.medienwissenschaft.huberlin.de /de/ medienwissenschaft/medientheorien/ernst-in-english.

21. Benjamin, 'A Short History of Photography' (1931), trans. Stanley Mitchell, *Screen* (Spring 1972), 5–26.

22. Benjamin, 'Marseilles '(1929), in *Reflections*.

23. The arrival of Moholy-Nagy in Berlin, the third largest city after New York and London, was part of the internationalisation of art and architecture that took place after the First World War.

24. Laszlo Moholy-Nagy and Ludwig Kassák, *Buch Neuer Künstler*, (Zurich: Lars Müller, 1996). Originally published in Vienna in 1922 as a propaganda piece for Constructivism in art, architecture, music, and technology.

25. Benjamin, *Arcades Project*, 883.

26. Ibid., N1,10.

27. The paratextual has been defined as all that precedes the content of the book or prepares the reader to gain access to the information, such as titles, chapter titles, headings and subheadings, indexes.

28. Benjamin, *Arcades Project*, C1,1.

29. Ibid., 883.

30. Ibid., N1a,1.

31. A. G. Meyer, *Eisenbauten* (Esslingen, 1907), cited in Benjamin, *Arcades Project*.

32. Giedion, *Building in France*, 7.

33. Benjamin, 'Short History of Photography', 24.

34. Meyer, *Eisenbauten*, cited in Benjamin, *Arcades Project*, F4a,2.

35. Roland Barthes, 'Eiffel Tower' in *A Barthes Reader*, ed. Susan Sontag (New York: Farrar, Straus and Giroux, 1982).

36. Laszlo Moholy-Nagy, 'Space, Time and the Photographer', in *Moholy-Nagy, An Anthology*, ed. Richard Kostelanetz (New York, Praeger, 1970).

37. Moholy-Nagy, 'Production-Reproduction', in *Moholy-Nagy*, ed. Krisztina Passuth (New York: Thames and Hudson, 1985), 289–290.

38. Benjamin, 'Short History of Photography', 526. A disturbing post-war testimony discloses how slave

labour from internment camps was used by the Krupp industrial complex throughout the Second World War, accessed 30 January 2016, http://forum.axishistory .com/viewtopic.php?t=64075.

39. Walter Benjamin, 'Paris, the Capital of the Nineteenth Century (1935)' in *Arcades Project*, 3.

40. Benjamin, *Arcades Project*, T1a,6.

41. *Citizen Kane* (1941), directed by and starring Orson Welles.

42. Benjamin, 'Berlin Chronicle', 6.

43. Ibid., 30.

44. Walter Benjamin, 'The Storyteller' in *Selected Writings, Volume 3, 1935–1938* (Cambridge, MA: Belknap Press/ Harvard University Press, 1999), 143–66, 'Half the art of storytelling [is] to keep a story free from explanation.'

45. Sanford Kwinter, 'The Hammer and the Song' in *OASE Journal for Architecture*, special issue *Diagrams*, no. 48 (1998), 31 accessed 30 January 2016, http://www.oasejournal.nl/en/Issues/48 / TheHammerAndTheSong#031.

46. Benjamin, *One Way Street*, 59

47. Benjamin, *Arcades Project*, NI,5.

48. Benjamin, *One Way Street*, 51.

49. Walter Benjamin, 'The Work of Art in the Age of Mechanical Reproduction' in *Illuminations*, trans. Harry Zohn (London: Collins/ Fontana, [1936] 1973).

50. Ibid., 13.

51. Walter Benjamin, 'Paris, Capital of the Nineteenth Century (1939)' in *Arcades Project*, 17.

52. Markus Jager, *Housing Estates in the Berlin Modern Style*, ed. Jörg Haspel and Annemarie Jaeggi, (Munich and Berlin: Deutscher Kunstverlag, 2007).

53. Benjamin, 'Paris, Capital (1935)', in *Arcades Project,* 4.

54. Giedion, *Building in France*, 3.

55. Walter A. Lyons, et al., 'The Hundred Year Hunt for the Sprite', *Eos* 81, no. 33, (August 15, 2000), 373–377. I was curious whether Red Lightning actually existed, and that is how I found out that it is only a recent discovery based on an accident with an infrared video camera that captured a flash while engaged in another experiment.

56. Benjamin, *Arcades Project*, DI,3.

57. Dolf Sternberger, *Panorama* (Hamburg, 1938), cited in Benjamin, *Arcades Project*, S9,3.

58. Benjamin, 'Concept of History', II.

59. Ibid., XI.

60. Sigrid Weigel, 'The Flash of Knowledge and the Temporality of Images: Walter Benjamin's Image-Based Epistemology and Its Preconditions' in *Visual Arts and Media History*, *Critical Inquiry* 41, 2 (2015), 365.

61. 'Surrealism' (1929) in Benjamin, *One-Way Street.*

62. Gilloch, *Walter Benjamin: Critical Constellations*, 101.

63. For a definition of *détournement*, see *Situationist International Online*, http://www .cddc.vt.edu/sionline/ si/definitions.html.

64. Kenneth Goldsmith, *Capital*, (New York: Verso, 2015), accessed 30 January 2016, http://www.poetryfoundation.org/harriet/2011/04/ rewriting-walter-benjamins-the-arcades-project/.

65. Benjamin, 'Paris, Capital (1935)', in *Arcades Project*, 6.

66. Benjamin, *Arcades Project*, S3,3.

67. Ibid., N3,1.

68. Ibid., R2,3.

Biography

Sarah K. Stanley is a writer, editor and media consultant based in Berlin and London working with international architects and artists since 2005. She studied art and architectural theory, media and politics at the Institute of Fine Arts, Hunter College and Columbia University. Her recent publications include 'Design Theory of Japanese Modernism' in the journal *Site* (Sweden), and 'The Philosophy of Photography' in a book published by Saarland Museum (Germany).