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## Cinema and/as infrastructure in interwar avant-gardes and empire aviation documentaries

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### Abstract

This article analyses cinematic exposition of aeriality in empire documentaries and avant-garde cinema from the interwar period to interrogate cinema as infrastructure, its weaponisation and deployment in the imperial project, and its convergence with aerial infrastructure which united the perception of Empire with the experience of modernity. I argue that the use of aeriality in the aestheticisation of infrastructures in avant-garde films like *De Brug* (Joris Ivens, 1928) and *La Tour* (Rene Clair, 1928) cannot be divorced from the ideology that is on overt display in Empire aviation documentaries such as *Wings over Everest* and *Contact*.

### Keywords

modernity, infrastructure, cinema, aeriality

## Introduction

Steel transforms our landscape. Pylon forests replace centuries-old trees. Blast furnaces replace hills ... Superimposition lends a fantastic appearance to the most precise machines and in front of a milling machine, covered in muddy oil, heavy debris and dripping water, one thinks of Dostoyevsky ... Bridges penetrate space. Trains break the horizon with a deafening roar ... And here is the Eiffel Tower, a bell tower of acoustic waves. Its incongruous monstrosity surprises and irritates ... Airplane, elevator, wheel,

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with which some humans soar to the kingdom of birds, suddenly change even our natural element.[1]

Cinema, modernity, and infrastructure are inextricably entangled. Modernity has a distinctly technological and infrastructural bent. Among other things, modernity is an acute awareness of time, first brought about by the mechanised clock. Lewis Mumford famously posited the mechanical clock as the key machine of the industrial age.[2] Hence, giving precedence to temporality and our experience of time, Charles Baudelaire defined modernity as the 'ephemeral, the fugitive, the contingent, the half of art whose other half is the eternal and the immutable'.[3] This mechanisation of time was an attempt to record and capture the ephemeral and eternal – the documentation of history in numerical values is one proof, cinema and photography are another. Modernity, claims John Peters, is also 'a proliferation of infrastructure'.[4] To be modern is to be in sync with infrastructure. It is 'to live within and by means of infrastructure'.[5] Modernity's relationship with infrastructure is not simply of the latter inducing the former. Modernity contextualises infrastructure and vice versa. The two co-construct each other.

Cinema is emblematic of modernity. It compresses and captures time and space. Since its inception, cinema has depicted infrastructural flow. In 1895, when the Lumière Brothers captured a train's arrival at La Ciotat station, they participated in making sense of modernity by depicting the flows of railway infrastructure. The short footage of the train entering the station did not just display cinema's potential to record and replay; the rolling in of the train into the station, which could be played repeatedly, was also proof of the smooth flow of railway infrastructure. As Tom Gunning has claimed, cinema transforms the shocks of modernity into flow.[6] Cinema has also been integral to depicting infrastructural imaginaries by imaging the many futures of modernity. Georges Méliès' sci-fi/fantasy film *A Trip to the Moon* (1902) did precisely that when the scientist-wizards charted a path to the moon, constructed the rocket, and completed a round-trip. In this early narrative film, infrastructure and modernity, image-making and imagination converged into a fantastical future realised some six decades later in the 1969 moon landing.

In film theory, the relationship between cinema and infrastructure has been used primarily to theorise early cinema and modernity. In his essay 'Modernity and cinema', Gunning shows how infrastructures, such as telephone, railway, and telegraph, impacted film narratives and editing practices.[7] Gunning's work gave a material specificity to the term 'modernity', which has an unfortunate tendency to slip into the abstract. Such infrastructural readings of the medium have been particularly useful in juxtaposing seemingly disparate objects. Paul Virilio's book *War and Cinema*, demonstrating the fatal interdependence between technologies of vision and warfare, exemplifies the rich potential of an infrastructural approach to cinema. That such readings are only now gathering steam in recent film and

media scholarship is a testament to the fact that infrastructures tend to be invisible and mundane while interfaces sparkle.

In 2015, Lisa Parks called for consuming media through an ‘infrastructural disposition’, or to take the framed object as a hermeneutic steer for imagining and inferring the elemental composition of the medium itself. She wrote, ‘when viewing/consuming media we must think not only about what they represent and how they relate to a history of style, genre, or meaning but also think more *elementally* about what they are made of and how they arrived’.[8] In other words, Parks advocates for reinstating the materiality and the physicality of infrastructures, so as to highlight the processes and the contingencies of their formation. A critical exploration of infrastructure establishes its significance in relation to socio-economic, geopolitical, and environmental conditions. It informs what she calls ‘infrastructural imaginaries – a way of thinking about what infrastructures are, where they are located, who controls them, and what they do’.[9]

This article responds to Parks’ call by interrogating cinema as infrastructure. Exemplifying the stakes and the values of this interrogation, I examine the weaponisation and the deployment of cinema as infrastructure in the imperial project. Taking an infrastructural disposition, I juxtapose European avant-garde cinema and British Empire documentaries from the interwar period to show that these two seemingly ideologically distinct genres share and are shaped by a similar impulse of modernity informed by infrastructure. This impulse is in stark focus in their shared fascination and utilisation of aerial infrastructure and aerial vision, wherein cinema functions both a) to represent infrastructure and b) as infrastructure itself. The deployment of aerial infrastructure and aerial vision in these two genres helped organise a new mode of perception that was crucial in shaping the image of the Empire as congruent with the promise of modernity. As illustrative examples, this article focuses on the cinematic exposition of aeriality in four films from the inter-war period: *De Brug* (Joris Ivens, 1928), *La Tour* (Rene Clair, 1928), *Contact* (Paul Rotha, 1933), and *Wings over Everest* (Geoffrey Barkas and Ivor Montagu, 1934).

I choose Empire documentaries and avant-garde cinema for their relationship to modernity and modernisation, their non-fiction characteristics, and their entanglement with war. The British empire documentaries *Contact* and *Wings over Everest*, as well as the two avant-garde films *De Brug* and *La Tour*, expound upon aeriality, aerial vision, and aerial infrastructure. If the two avant-garde films revel in the orientating and disorienting ability of aerial vision, the two documentaries educate on the packaging and potential of aerial infrastructure. All four films traffic in the mechanics and the magic of aeriality. The interwar timeframe of this article considers the rapid expansion of mass media infrastructure during this period, in which film was the most popular and the most important medium of entertainment.[10] The British Empire was at its most powerful and at its most paranoid during the interwar period. As Eric Hobsbawm puts it, ‘Never had a larger area of the globe been under the formal or informal

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control of Britain than between the two world wars, but never before had the rulers of Britain felt less confident about maintaining their old imperial superiority.[11] The interwar period also marks the apotheosis of extracting aerial vision from its military origins and disseminating it as the ultimate condition of Western modernity.

To clarify, my aim is not to put forward a determinist argument. I do not claim a singular modernity – an idea that maintains the hegemonic binary between the ‘occident’ and the ‘orient’. Plural modernities and the myriad terms of their consumption and participation have been well-established and have proven to be extremely fruitful in dismantling hegemonic discourse.[12] Rather, I situate myself alongside works that have attempted to revisit avant-garde cinema vis-à-vis modernity. Avant-garde’s diametrical opposition to bourgeois modernity and instrumental rationality is often cited to highlight the radicalness of the movement.[13] Such claims, however, tend to overlook the genre’s fascination with physical infrastructures and technology. By focusing on infrastructural imaginaries, this article seeks to emphasise the aesthetic and ideological resonances between avant-garde and empire documentaries.

The avant-garde’s fascination with aerial infrastructure and aerial vision puts it in an uncomfortable proximity to Empire cinema. When avant-gardists expounded radical aesthetics and alternate perceptions of modernity, they did so through the very tools of modernity. Indeed, some avant-garde movements, such as Futurism and Constructivism, were proponents of the acceleration brought about by rapid industrialisation and technological development.[14] Modernist works have always showed an inclination towards the ties between modern technology and social progress. Infrastructural development was crucial to the image of empires. Paul Gilroy, for example, posits British Empire’s Exhibition at Wembley Park in 1924 as proof that government instrumentality has always been in stride with technological change.[15]

Totalitarianism, political modernity, and concentrated spectacle, after all, are unfortunate bedfellows.[16] Aesthetically, modernist techniques of avant-garde cinema, such as mobile framing, superimposition, fragmentation, and rhythmic editing, were adopted early on by documentaries – the preferred genre of British Empire documentaries to advocate for new technologies and technological modes of being.[17] The content of these documentaries as well as avant-garde films often were infrastructures such as railroad, postal service, shipyard, airplanes, and bridges themselves. Aerial infrastructures, which this article singles out, are indebted to the histories of warfare and imperialism. Scott Anthony has argued that ‘international modernist art and documentary cinema would prove crucial to thinking through the impact of aviation on empire’.[18] As such, the use of aeriality in the aestheticisation of infrastructures in avant-garde films like *De Brug* and *La Tour* cannot be divorced from the ideology that is on overt display in Empire aviation documentaries such as *Wings over Everest* and *Contact*.

## Cinema as infrastructure

Infrastructures are unwieldy and yet notoriously hard to pin down. They can be both hard and soft, material and immaterial, institutional and intellectual, visible and invisible, human and technological.[19] Infrastructures, writes Brian Larkin,

are things and also the relation between things. As things they are present to the senses, yet they are also displaced in the focus on the matter they move around. We often see computers not cables, light not electricity, taps and water but not pipes and sewers.[20]

Infrastructures are 'large in structure' but can be 'small in interface'.[21] They demonstrate 'material power and agency but also are imbued with social meanings'.[22] Infrastructures are often underneath but always require upkeep.

Categorising cinema as infrastructure may seem like belaboring a glaringly obvious point. However, doing so is a polemical act which, given the relationship between infrastructure and modernity, decides who is 'in' and who is 'out', and determines modes of seeing and sensing. Cinema goes from being an emblem of modernity to containing and constructing modernity. To consider cinema as an infrastructure is to blur the distinctions between infrastructure and apparatus, aesthetics and politics, ontology and epistemology. Infrastructures enable other matters to move, getting displaced in the process. Like infrastructures, cinema animates but is rendered invisible. Infrastructures operate as a system and, as such, cannot be theorised solely in terms of an object.[23] Its myriad components must be accounted for. In the case of cinema, this system consists of the cinematic apparatus (screen, projector, camera, and film stock), theater, electricity, cables, and wires, among others. Studying cinema as an infrastructure opens new modes to think about, for example, in thinking about how cinema changed landscapes cinematically as well as from an everyday, lived perspective.

To think of cinema as infrastructure is to position cinema as a 'space of flow' – a dynamic metaphorical space where the interplay between technology and larger patterns of socio-economics, politics, history, and psychology takes place.[24] In Manuel Castell's formulation, 'spaces of flow' exist in opposition to 'spaces of places' and are sites of negotiation. As apparatus, cinema is constantly in negotiation with global and local forces. As infrastructure, cinema is a system of operations, all of which undergo such negotiations. Technology operates at a micro-level and thus can only stand in as a symbol of the macro-level ramifications of modernity. Infrastructures, however, traverse these scales. Talking about the scalar difference between technology studies and modernity theory, Paul Edwards argues that 'infrastructure, as both concept and practice, not only bridges these scales but also offers a way of comprehending their relations'.[25] Thus, categorising cinema as infrastructure opens up room to consider developments in different spaces as well as

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different genres and sensibilities simultaneously rather than as oppositional and uni-directional. Furthermore, infrastructures require upkeep and labor, revealing in the process the socio-economic relations and negotiations between distant spaces. As such, an infrastructural approach to cinema extends Miriam Hansen's analysis of cinema and modernity beyond the aesthetics and production/consumption approach of 'vernacular modernism'. [26]

Applying what is in effect an infrastructural approach in her book *Fiery Cinema*, Weihong Bao reads wartime Chinese propaganda cinema as a reflexive practice that ties together vernacular and political modernisms. These two modernisms, represented by the otherwise disparate aesthetics of classical Hollywood cinema and left-wing Soviet/European cinema, respectively, were articulated not just in the aesthetics of the Chinese cinema of this period. They were reflected in the very conception of cinema as "a technological system," an infrastructure interweaving a media ensemble, a network of instant, simultaneous dissemination and transmission that conjoined film and other media – posters, photography, painting, street performance – in innovative forms of distribution and exhibition'. [27] Cinema as infrastructure is apparent in the book's structuring question:

What, then, is cinema? Is it the image on the screen, its material technological support – the screen, the projector, the celluloid print, its built environment – or the social space articulated? Or is it what eventually affects the spectators – the crowd that completes and destabilizes cinema's realization through transformations of their own perceptions and actions? What is the role of the theater in this case? Is it a competing medium, a social space, or a particular mode of performance? [28]

### **Cinema and/as infrastructure in the imperial context**

The fluidity of cinema as/and infrastructure finds great resonance in the imperial context. Imperialism was in part dependent upon a project of infrastructural expansion. In a sense, the term 'empire', a collective word for a group of territories that converge through a single authority, reflects what infrastructure stands for: 'a collective term for the subordinate parts of a substructure, foundation; specifically, the permanent installations forming a basis for military operations, as airfields, naval bases etc.' [29] Considering the longstanding association between infrastructures and military operations, it is little surprise that the history of imperialism is also a history of the proliferation of infrastructure. Colonial authority, diplomacy, surveillance, and spectacle played out through infrastructure – and so did colonial resistance.

In addition to mercantilism, the origins of imperialism were also infrastructural. Developing infrastructures was a way to strengthen the Empire's military might. Colonisation was frequently rationalised as a legitimate exchange-based enterprise – infrastructural

development in exchange for imperial rule. Ideologically, infrastructural development was an enlightenment project. Discussing infrastructural proclivities of empires in colonial Nigeria, Brian Larkin writes:

the ideological development of contemporary infrastructures has its roots in the Enlightenment project of rationally engineering the world, ordering it according to the free circulation of goods and ideas. This is one of the two ways infrastructure came to function in the colonial arena. Infrastructure created the connecting tissue linking disparate territories into a state and facilitating the rise of a centralized political administration ... infrastructure was just as important as a representation, evidence of the civilizing promise of colonial technical superiority.[30]

In other words, infrastructures served various roles during colonialism. Infrastructural development was a military project that connected colonies, thus creating a system that facilitated an uninterrupted flow of authority. For the empires, the visibility of infrastructure was a justification for colonisation. For the colonies, infrastructures represented imperial benevolence. It also presented the Empire as mighty and powerful.

Infrastructural construction and its representation were part of the imperial production of spectacle. Larkin argues that this spectacle was in fact the production of a sublime which, in the context of colonialism, was directly related to power. The sublime works on a comparative pole wherein the Empire's technological prowess is juxtaposed next to tradition.[31] By inducing awe as well as terror, the sublime in the colonial context asserts power through infrastructure. Larkin writes, "The erection of factories; the construction of bridges, railways, and lighting systems; indeed, the terrifying ability to remake landscapes and force the natural world to conform to these technological projects ... these were the ways in which the sublime was produced as a necessary spectacle of colonial rule." [32] Imperial infrastructure differentiated, categorised, and incited awe.

Cinema holds multiple significance within the scopic regimes of imperialism. Cinema apparatus and infrastructure provided the British as well as French empires with opportunities to reinforce and regulate their colonial subjects.[33] As much as colonial subjects succumbed to cinema's interpellation, they also found ways to resist it. The production of sublime as spectacle by empires found a happy convergence in cinema technology. Through cinema, the sublime could not just be captured and replayed, cinema apparatus and infrastructure became part of that sublime. Cinema could record something extraordinary. Cinema also presented the ordinary in an extraordinary fashion – a dynamic of the avant-garde aesthetic. Through cinema, empires found a much efficient and cost-effective infrastructural base for manufacturing colonial spectacle. To put it in Johnathan Beller's words,



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Rather than requiring the state to build the roads that enable circulation of its commodities, as did Ford, the cinema builds its pathways of circulation directly into the eyes and sensorium of its viewers. It is the viewers who perform the labor that opens the pathways for new commodities.[34]

This intersection between infrastructure and cinema was key to the British empire's exaltation of its might and wealth during the interwar period. The cinema, writes Lee Grieveson, 'became, for a time, an important element in fostering the wealth of the nation and the elaboration of a capitalist and imperialist governmentality'.[35] In 1926, a film unit was established within the Empire Marketing Board (EMB) to support the board's vision of strengthening networks within the Commonwealth and the imperial bloc.[36] John Grierson led the charge to execute this vision by centering infrastructures as the subject of EMB films, arguing that these films should take advantage of the 'visually dramatic material in which the Empire is so rich'.[37] Using Soviet montage, often to show the flow of goods between colonies and empire, EMB films generated spectacular images of imperial economy. Meanwhile, the films stood as material proof of this connective economy through their own circulation in film circuits, mobile theaters, and cinema halls within the metropole and in the colonies.

Cinema theatres, an important physical part of the cinema infrastructure, functioned as public sphere while also ordering the public in new spatial modes. Initially, when cinema technology and infrastructure were introduced by the Empire it was an elite and racially coded preoccupation. Cinema-going, however, quickly became popular with the masses and turned into an indigenous practice in most colonies.[38] In the paradigmatic case of the Indian subcontinent, filmmaking itself became an indigenous practice as early as 1913.[39] Cinema theaters were social spaces for intermixing and collective gathering. British authorities were also quick to recognise the connotations of riotous mobs and revolutionary masses threatening the political and social order. As Stephen Hughes has observed, colonial authorities harbored an aversion to the 'idea of crowds of Indian working-class men gathering for film shows in close proximity to important government institutions'.[40] The seemingly egalitarian space of the theatre was quickly stratified into a class-based ticketing and seating structure which, in colonial India, ranged from 'floor class' to 'bench class' to 'chair class', with the floor class being closest to the screen.[41] The theaters also included a sex-segregated seating option. The distance from the interface of cinema infrastructure (i.e., the screen) and the audience was a space of conflict where authority was enacted and transgressed all at once.

As infrastructures are wont to do, colonial cinema regimented. Film, writes Friedrich Kittler, 'imposes its rhythm upon average people'.[42] Cinema's rhythm standardised the pace of modernity. As mentioned above, cinema rendered the shocks of modernity into a flow of twenty-four frames per second. This 'smooth' flow can instill a desire for a different rhythm of modernity that spectators in colonised spaces might not have access to, especially

considering that infrastructural breakdown was a common phenomenon in the colonies. For Le Corbusier as for Henry Ford, regularity, order, control, and regimentation constituted Western modernism; all of which congealed in cinema for Ford, who actively used its rhythm to educate, promote, and develop infrastructure.[43] Rhythm, which ties cinema with war technology, is the pathology of modernity as well as the panacea against it. Miriam Hansen notes that these competing discourses found articulation in the avant-garde cinema of the 1920s. For example, the temporal manipulation through rhythmic editing, as found in Soviet montage, is an articulation of the experience of modernity – ‘an overcoming of natural by mechanical rhythms’.[44]

In avant-garde cinema as in colonial cinema, technologies of vision have been complicit with technologies of locomotion. Even though vision was privileged as the ultimate sense in Western modernity, this complicity forged specific rhythm onto the body. From panoramic vistas captured through ballooning, and simulating the sensation of hurtling across time and space on a railway track, to recreating aerial movement, both genres tied together seeing with sensing and inserted the material body as a crucial node of cinema infrastructure. Often produced by attaching the camera to aerial infrastructures, sight and flight converged in avant-garde films and empire documentaries. As Teresa Castro claims, ‘The particular pleasure of the cinematographic gaze, as far as the aerial view is concerned, lies precisely in the oscillation between visual and kinaesthetic – indeed cenesthetic – perception.’[45] ‘I am seeing’ of the cinematograph converged with the ‘I am flying’ of the flying-machine in both avant-garde and empire documentaries.[46] The mobilisation of motion and emotion is what infrastructures are uniquely equipped for. After all, infrastructures ‘consist of matter ... and they have material effects on the people who build, maintain, and use them’.[47] These categories of labor and use are much too often disparate, class-based, and racialised, as all four films discussed below demonstrate in their exposition of aerial infrastructures and aerial vision.

## **Aerial exposition and infrastructural modernity**

All four films, *De Brug*, *La Tour*, *Wings over Everest*, and *Contact*, are emphatically infrastructural in terms of their content – the Rotterdam bridge, the Eiffel tower, and aerial infrastructures, respectively. Furthermore, they all operate on a similar register of visibility/invisibility within which infrastructures reside. In other words, these films pay particular attention to the mechanical composition of the infrastructure, emphasising what and how these objects enable rather than focusing solely on the object as a whole. In this regard, each film offers a microscopic view of the constituents while also containing the macroscopic whole. Just as seeing is connected to sensing, the micro and the macro, the view from above and from below are interconnected and must be studied in conjunction.[48] Taking these two types of images together allows one to read the aesthetic and the political,

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harmony and dissonance, as well as continuity and discontinuity, which is, in a sum, the contradictory experience of modernity.

Perhaps no other film lends itself more to a modernist infrastructural reading than Joris Ivens' *De Brug*. A symphony of de-humanised mechanical movement, this film is a flamboyant articulation of rhythm and scale. It features shots that move from one extreme to another. For example, a panoramic skyline vista punctuated by vertical crane structures is followed by an extreme close-up shot, an upward tracking shot cuts to a view from above of the city, and a long shot of the train's arrival cuts to an extreme close-up of the smoke billowing from said train. The subject of *De Brug*, the Rotterdam Bridge, appears as a feat of engineering – a view facilitated by Ivens' composed angular shots of the huge wheels, the girders, the steel, and the metal. Even when the bridge appears in totality in occasional long shots, it stands imposingly amidst the urban milieu of Rotterdam. Such images place *De Brug* among a stream of films from the 1920s that feature an almost Futurist aestheticisation of the machine, such as *Ballet Mécanique* (Fernand Léger, 1923-24), *Berlin: Symphony of a Great City* (Walter Ruttmann, 1927), and *Man with a Movie Camera* (Dziga Vertov, 1929). All these films also serve as examples of the avant-garde's intimate relationship with technologies of locomotion, in particular flying machines.[49]

One could argue that the anti-humanist inclination of *De Brug* is dispelled by shots of a man behind the machine or the one inspecting it. However, the composition of the shots is such that the machine overpowers the human. Consider, for example, the sequence where Ivens films a man climbing up the ladder of the bridge. The film cuts from the close-up of a flat steel pane to a low angle shot to show a man climbing up the large structure of the bridge. Once he arrives at the landing, the man, a tiny speck in the frame, looks up at the imposing structure and continues his climb. He constantly stops, pausing here and there, looking down at the city at one point. Ivens cuts to a view of the city from above where we see the smooth pace of the city's infrastructure old and new. Humans, by contrast, look miniscule.

In the film's last few minutes, *De Brug* rhapsodises the speed and scale of the railway, sandwiching the rail tracks/bridge between locomotive technologies of the past and the future. Ivens' camera-eye cuts from the rail tracks to a horse-drawn carriage below the bridge. The camera pans up, giving us yet another glimpse of the railroad before cutting up to show a view of the sky from below where a shadowy airplane is in mid-flight. The juxtaposition of these shots invokes the logical and linear progression of Western modernity vis-à-vis infrastructure, from carriages to steam engines to airplanes.

A similar machinic inclination can be found in Rene Clair's *La Tour*. Like *De Brug*, *La Tour* begins with a shot of the Eiffel Tower from below. Immediately, Clair cuts to the movement of machines that make up the tower. A low angle shot looks up at the elevator's downward movement. Rather than relying on the juxtaposition of shots conveying extreme scales like

in *De Brug*, *La Tour* makes liberal use of superimpositions, often to convey different rhythms. Superimpositions are the preferred method of showing change, as seen in the sequence of still images that slowly reveal the tower's construction. Like *De Brug*, aerial shots of Paris from the top of the Eiffel Tower show a modernised city in constant motion. An upward tracking shot of the tower lingers on the steel structure and one can see a tiny human figure moving across one of the landings of the tower. In contrast with Ivens who often employed a single perspective of what the city looks like from above, Clair's shot of the tower reveals the incremental change of the city view from above, as the camera slowly moves up the steel structure. Unlike *De Brug*, which ends with a lateral moving view of the bridge, *La Tour* ends with a stationary aerial perspective of Paris, as the screen turns black, and we see the Eiffel Tower in its entirety.

Both *De Brug* and *La Tour* promote aerial vistas of imperial metropolitan cities (Rotterdam and Paris, respectively) as a stage of modern urbanism and industry. The bridge and the tower provide a frame of reference through which the empire can be perceived as spectacular, mobile, and free from the limitations of the body. Both films portray a de-humanising system to put forth macroscopic as well as microscopic modes of perception, augmented by the machine. The epic scale of the empire is only usurped by the ability of cinema technology to enter the narrowest of gaps. Long shots of both the bridge and the Tower, despite the dismemberment of these structures in the films, reinforce the sense of their functional and geographical context. Symbolically, the bridge is a triumphant emblem of modernity, a connector. It breaks boundaries and changes landscapes. Similarly, the history of the Tower – a monument built as a centerpiece for the 1889 Paris Universal Exposition – places it as the ultimate symbol of industrial capitalist enterprise.

Avant-gardists embraced cinema and locomotion as the ultimate mode of freeing the body from the limitations of time and space. Dziga Vertov's 1923 pamphlet exemplifies his desire to unite with the machine, as he declares:

I am kino-eye, I am a mechanical eye. I, a machine, show you the world as only I can see it. Now and forever, I free myself from human immobility, I am in constant motion, I draw near, then away from objects, I crawl under, I climb onto them, I move apace with the muzzle of a galloping horse, I plunge full speed into a crowd; I outstrip running soldiers, I fall on my back, I ascend with an airplane, I plunge and soar together with plunging and soaring bodies [...] Freed from the imperative of 16-17 frames per second, free of the limits of time and space, I put together any given points in the universe, no matter where I've recorded them. My path leads to the creation of a fresh perception of the world. I decipher in a new way a world unknown to you.[50]

This desire for freedom of mobility is surpassed only by the desire to gather images from different points of the universe. The imperial desire to chart new pathways and capture new

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territories are implicit in such a declaration. This is hardly surprising when one considers the military roots of the term avant-garde, the front flank of the army or the advance guard that prepared the way for the rest of the troops.

The ideological implications of the avant-garde's modernist aesthetics and its love for infrastructure found a much more overt articulation in British Empire films of the interwar period. In *Wings over Everest* and *Contact*, the obsessive display of infrastructure tied together with labor – the two pillars of an imperialist enterprise – asserted an imperial vision of modernity founded on the regimentation of bodies and the mastery over terrain. Considering the paranoia of the British Empire during this time, both films also succeeded in re-orienting and policing its own image. *Wings over Everest* begins with a voiceover that imagines the expansion of the British Empire's territorial claim, facilitated by aerial and cinematic infrastructure. In 1933, says the narrator,

a vision of another type of conquest began to take shape. In the new age of the airplane might not men with wings succeed where men on foot had failed?

The mission was 'to put Everest on the map in three hours' with 'a camera shooting down' to 'record every detail'. It is impossible to miss here the same avant-gardist desire to be one with the machine ('men with wings') in order to chart and to capture new territories.

Whereas the avant-garde embraced the machine without paying heed to bodily risks present in such a unity, *Wings over Everest* is careful to lay them out. Lady Huston, the benefactor of the expedition, expresses her enthusiasm for the mission but also her reservations. 'I will not help you commit suicide', says the Lady, a fear quickly assuaged by the claim that it has all been 'worked out'. This move is particularly necessary to set up the amount of labor, planning, and technological know-how that the empire possesses. The successful culmination of the expedition at the end spectacularly heightens this display. The sequence then cuts to a lengthy exposition of the assemblage of gears and cogs. The frame of the plane, along with its many parts, leaves for India by sea to be assembled there. The fragmented images of the ship's travel is interspersed with an animated map that reveals the distance traveled. This sequence serves to present a composite image of the otherwise expansive and geographically fragmented British Empire.

Cartographic animation in the film gains new meaning when juxtaposed with another similar sequence once the expedition literally takes off. We see images of the majestic mountain range obstructed by wing segments of the plane. As the narrator highlights the great risk taken by the members of the expedition, the film cuts to a map as a finger points at the words 'Everest' and 'Makalu' written over an abstract image that is otherwise unidentifiable. As one of the crew members looks out the window of the plane, the camera zooms into the map which is rhythmically superimposed with real images of the mountaintop, the words spelling

out the names of the range take position atop the peaks. The overcoming of bodily limitations, achievable only through aerial infrastructure and the aerial view captured through the camera elevates ‘cartography to a more precise scientific level’.[51] The natural wonders, thus captured, produce yet another sublime in service of the empire.

Paul Rotha’s *Contact* also employs the modernist technique of fragmentation, superimposition, and de/familiarisation, that are used by the three films described above. One among the series of films Rotha made for Imperial Airways in the 1930s, *Contact*, writes Martin Stollery, ‘made the most significant contribution to new ways of seeing the Empire’.[52] An accelerated montage of sea, road, and rail infrastructures leads up to intertitles that read ‘NOW/AIR’. The film cuts to aerial images of the cloud and sound of the aircraft. We then move into a sequence of the graphs and blueprints of the aeroplane construction, reminiscent of Clair’s *La Tour* where we see blueprints of the Eiffel Tower. *Contact* then cuts to a long sequence filled with shots of the individual machines and their assemblage. Here too, we see men working together to assemble the plane. A long shot shows us the finished plane in all its majestic glory, complete with the British Empire’s flag gently fluttering in the wind. Whereas in *Wings* the flight is limited to a select few, *Contact* and its representation of aeriality as a commercial enterprise is seemingly inclusive with regards to who can access the ‘freedom of the air’.

Once airborne, the flight maps out an imperial space that is perceived aerially as both abstract and concrete. Some views from above render the space flat and comprehensive, whereas others are indistinguishable. The abstract images lend credibility to the view from above as objective, and even scientific. The problem of seeing issued by such abstract aerial views seem revelatory of things otherwise hidden from sight. In this regard, the morphing together of aerial and cinematic infrastructure gains further significance as systems that enable objectivity. The images in *Contact* consistently move back and forth between holistic and fragmentary. Often, we see the shadow of the airplane over aerial landscapes, followed by images of the airborne propeller. This juxtaposition serves to further emphasise the infrastructure. The plane passenger and the film audience travel from ‘city to city’, and ‘land to land’, ‘crossing latitudes of space and time’. As such, the film belongs to the travel genre that is linked to industrial and colonial expansion. Gunning notes that the travel genre ‘occurs within a context of feverish production of views of the world, an obsessive labour to process the world as a series of images’.[53] In other words, exploration is linked to conquest of space by vision. Given their proclivities to conquer and capture space mechanically, all four films can be regarded as attempts to create an objective image archive of the world – an impulse rooted in notions of enlightenment.

Modernity as an idea oscillates between the experienced and imagined. The technical function of infrastructures stimulates the experience but can also generate desire and fantasy. The experience of infrastructure is ‘an enthusiasm of the imagination’.[54] Needless

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to say, cinema furnishes desires. Its capacity for motion also offers an experience, containing a sense of mobility. Cinema, as Denis Cosgrove notes, is a

uniquely successful way of producing dramatic, mobile images. Like driving and flying, cinema offers a kinetic spatial experience characteristic of modernity, transforming the possibilities for representing space cartographically.[55]

Likewise, cinematographic aerial vision is a sensation afforded and intensified by the mobility of point-of-view and speed. Consuming aerial images is an act of modernity that goes beyond the experience of earth from a unique angle or the feeling of visual domination.

Like the characterisation of cinema as infrastructure, the production of aerial imagery too is a polemical act. It establishes relations of looking and experiencing. When we see a native looking up at the airplane in *Contact*, it connects dominant and subordinate positions. The person on the ground is excluded from the experience of aeriality. The bird's-eye view or the look down afforded by aerial vision connects to the worm's-eye view or the look up.[56] Likewise, the alignment of the spectators with machinery, employed predominantly by *De Brug* and *La Tour*, ignores the place of the individual within the infrastructural setup. *Wings over Everest* and *Contact*, on the other hand, demonstrate the labor process that goes into the system that makes up the Empire's aerial infrastructures. Such representations seemingly work towards infrastructural inclusivity, or inclusion in the process of infrastructural assemblage. However, they also articulate infrastructural positionality, a representation of one's position vis-à-vis the infrastructure. Such representations of the mass and the position they occupy within the Empire's infrastructural imaginary can create a sense of dissatisfaction which holds a radical potential. The exclusion of any labor force whatsoever in Clair's rendering of the construction of the Eiffel Tower can be viewed as egregious in this regard. At the same time, the aestheticisation of the Eiffel Tower or the Rotterdam Bridge could render these otherwise familiar symbols unfamiliar and thus exclusive.

The materiality of infrastructures contains within themselves the forces that cannot be fully reduced to intentions. In as much as infrastructure can be visualised, they also create the conditions of visualisation. As Larkin writes, 'aesthetics is not representational, but an embodied experience governed by the ways infrastructures produce the ambient conditions of everyday life'.[57] As demonstrated through the analysis of the four films above, the ideology of infrastructure cannot be omitted from their aestheticisation. The historical relationship between cinema and infrastructures is one of the contexts that have produced certain modes of representation. Within this context, aerial cinematography is particularly significant in illustrating the convergences between aerial infrastructure and the creation of a technological sublime that has historically served the purpose of war and imperialism.

Infrastructures function as spectacle, but they also mobilise affect, pride, frustration, and other deeply political feelings that form subjectivities.[58] As such, infrastructures hold the capacity to incite resistance. Inasmuch as modernity is a proliferation of infrastructure, it is also a 'condition of *systemic vulnerability*'. [59] Infrastructures are vulnerable to breakdowns. They remain open to sabotage. At its most political, sabotage generates spectacular acts of resistance that one finds in anti-colonial cinema. At its most prosaic, infrastructural sabotage generates spectacular images of bridges, towers, and trains blown to smithereens that are commonplace in contemporary cinema. It is perhaps these contradictory impulses of development and destruction inherent to infrastructures that make them spectacular cinematic objects as well as subjects.

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## Notes

- [1] Fels 1928, unpaginated (translations from French are my own).
- [2] Mumford 1934, pp. 14-15.
- [3] Baudelaire 1964, p. 13.
- [4] Peters 2015, p. 31.
- [5] Edwards 2003, p. 185.

- [6] Gunning 2006, p. 310.
- [7] Ibid, p. 304.
- [8] Parks 2015, p. 357 (emphasis in original).
- [9] Ibid, p. 355.
- [10] Ross 2006, p.157.
- [11] Hobsbwam 1994, p. 211.
- [12] See Appadurai 1996; Hansen 2010, pp. 242-258.
- [13] Citing Matei Calinescu, Theodore Adorno, and Daniel Bell among others, Malcolm Turvey points out how avant-garde cinema was valorised for being in opposition to these two notions. Turvey 2011, pp. 1-17.
- [14] Ibid., p. 9.
- [15] Gilroy 2011, p. 24.
- [16] For a discussion on totalitarianism and spectacle, see Debord 1977 and Arendt 1967.
- [17] Nichols 2001, p. 582.
- [18] Anthony 2011, p. 141.
- [19] Mattern 2018, pp. 318-319.
- [20] Larkin 2013, p. 329.
- [21] Peters 2015, p. 31.
- [22] Mukherjee 2020, p. 7.
- [23] Larkin 2013, p. 329.
- [24] Castell 2004, p. 140.
- [25] Edwards 2003, p. 186.
- [26] Hansen 2000, pp. 316-331.
- [27] Bao 2015, p. 26.
- [28] Ibid., p. 2.
- [29] Oxford English Dictionary, <http://www.oed.com.proxy.lib.uiowa.edu/view/Entry/95624?redirectedFrom=infrastructure#eid> (accessed January 2023).
- [30] Larkin 2008, p. 8.
- [31] Ibid., p. 36.
- [32] Ibid.
- [33] While this article focuses predominantly on the British empire's use of cinema, one finds similar inclination towards using cinema for control, regimentation, acculturation, and propaganda in various imperial contexts, including the French empire. Odile Goerg (2020), for example, discusses the spread of cinema as escape and education in colonial West Africa within the French imperial context.
- [34] Beller 2006, p. 209.
- [35] Grieveson, 2011, p. 73.
- [36] Ibid., p. 74.
- [37] Ibid., p. 94.
- [38] Larkin 2002, p. 323.

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- [39] Reportedly after seeing a lavish film based on the Christian Bible, Dadasaheb Phalke (widely considered to be the father of Indian cinema) acted upon his urge to see Indian gods and images on the screen by making *Raja Harishchandra* in 1913.
- [40] Hughes 2000, p. 49.
- [41] Athique 2011, pp. 147-160.
- [42] Kittler 1999, p. 39.
- [43] Thanks to reviewer 1 for pointing out the connection between Ford's affinity for cinema and infrastructure. Ford's proximity with fascist ideology is yet another facet worth exploring further through the framework of cinema as infrastructure.
- [44] Hansen 2011, p. 243.
- [45] Castro 2013, p. 118.
- [46] *Ibid.*
- [47] Mukherjee 2020, p. 7.
- [48] Amad 2020, p. 210. See also Amad 2010, p. 262.
- [49] See Amad 2020.
- [50] Vertov 1964, p. 17.
- [51] Amad 2010, p. 271.
- [52] Stollery 2000, p. 161.
- [53] Gunning 2006, p. 32.
- [54] Mrazek 2002, p. 166.
- [55] Cosgrove 2006, p. 50.
- [56] Ellis 2021, p. 13.
- [57] Larkin 2008, p. 336.
- [58] *Ibid.*, p. 333.
- [59] Edwards 2003, p. 196 (emphasis in original).