



spaces become key nodal events, where time and territory along its routes are converted for maximum value efficiency. But as the rail-route speeds through the growing deserts in its regions, the shifting lands attests to ongoing exploitation and resistance. With an optimization of commodity movements, the counter-efforts of slowing the desert have become increasingly pressing as Asian dust storms frequently ride the air currents, sometimes as far as California, blind to jurisdictions.

The storm moves through a series of chemical transformations where during their long-range transport, its particles collide with bacteria, gases, and coagulate solid particles. “The dust aerosol [mixes] with pollution aerosol, such as industrial soot, toxic materials, and acidic gases” (Yele Sun et al, 2005) as it travels over China’s heavily industrialized zones. Particulate matter is then scattered, congealed into a whole new series of constellations, embroiled with manufactured and chemical residue: “What emerges, then, is a contest between the tenacity of corporeal memory and the corrosive power, over time and space, of corporate amnesia emboldened by a neoliberal regime of deregulation.” (Nixon 2009, 449) They collect the corporate afterlives of the unevenly distributed ravages remnant of high-carbon industrial practices, bringing a sense of an environmental uncanniness when modernity is materially readdressed with the unintentional consequences of its own grand designs.

In light of such movements, the formations of these studies on logistical innovations towards economic growth must be understood alongside managing weather behaviours and methods of containment. John Durham Peters describes what he calls “logistical media” to “establish the zero points where the x and y axes converge.” (Peters 2016, 37) Ned Rossiter includes various logistical media ranging from calendars and clocks, to addresses, maps, indexes, and logs, to extend inquiry on logistical media’s “[coordination] and control [of] the movement of labour, people, and things situated along and within global supply chains.” (Rossiter 2015, 139). Both Peters and Rossiter engage with media as ordering devices, providing a closer attentiveness to the protocols structuring the parameters in which movement occurs. With growing scholarly attention on the role of logistics in shaping the conditions of contemporary political, economic, and social life, this article seeks to bring in a more ecologically informed understanding of logistical media. Within the literature on logistics, a select number of authors take as their main focus the linkages between capitalism, modernity and imperialism (see, for example Chua, 2017; Cowen, 2010; Moten and Harney & Moten, 2013; Sekula, 2002 [1995]). However, these prior inquiries scarcely frame these histories as a longer project, where calculating material conditions such as weather acted as foundational to global forms of capitalism.

Drawing on a range of reportage and theory, I utilize the conceptual tools of new materialism to highlight how the specific mechanisms that shape the industry of logistics to the goal of profitability for capital have long colluded with spatial and environmental conditions. I use these theories to foreground the role of environmental agency where, as Karen Barad explains, agency “is about the possibilities for changing the configurations of spacetime-matter relations... [and] power is rethought in terms of its overall materialising potential.” (Barad 2007, 230) Barad’s idea of “intra-action” argues for a more performative and discursive practice of understanding, or, as she writes, “thingification—the turning of relations into ‘things,’ ‘entities,’ ‘relata’—[which] infects much of the way we understand the world and our relationship to it.” (Barad 2007, 812) To trace practices of calculating and predicting weather also entails tracing epistemological shifts which “intra-act” in ways to further the expansion of empire during the 18th and 19th century. The project of optics and of observation came to shape later practices of fluid-dynamics and logistics in formations which powered commerce, measurement, and forecasting. The global economy, as a result, was very much influenced by ambitions of what anthropologist Anna Tsing calls “scalability,” where scientific reason and pre-emptive calculations, remnants from the Enlightenment, brought forth a certain assemblage of governmentality over geographies of distribution and production. (Tsing, 2012, 505) In this article I will place Paul Virillo’s notion of speed into productive tension with Anna Tsing’s terminologies of friction and scalability when speaking of geographies across the supply chain. I also aim to evoke Amitav Ghosh, Denise Ferreira da Silva, and Rob Nixon urgent calls to bring together postcolonial and environmental theories. Here I consider the intrinsically colonial past of logistics against the currently unsettled desert of Xinjiang, China.

The method of argumentation in this article goes in order of three scales: from a general investigation into the relationships between weather-natural phenomena and logistics, the management of sand and wind

across western Chinese territories, to the closer lens of Hewlett Packard's involvement in the New Silk Road as case-study. I begin with the extended histories of intermediary infrastructures and their roles in co-constructing global-scale production networks, as a way to stress its importance towards understanding contemporary conditions along the New Silk Road project. To this end, I refer to the railroads from the early Central Asian cotton and oil industry, as extensions to topologies of technoscientific practices and observations. They bled into ideal designs for smoothness and efficiency, translated from weather to the organizations of forms and movements. In the late 1950s, the Vietnam War served as a testing ground for logistics and provided a key example of how differences were reproduced and felt along the chain. Finally, the digitalization and abstraction of pre-emptive network organization acted as a continuance of economic hierarchies between the Global North and South that we see in today's supply chains, with Hewlett Packard taking origins from the U.S. military industrial complex. The global race to the bottom naturalizes deeply engrained inequalities, alienation, and violence. It is particularly urgent to relink these histories as we see an increase of logistical practices used as tools to remake and rescale territories.

The argument of the article continues to the management of sand and increasing desertification issues in western China, largely as a result of large scale social agricultural experiments. Environmental factors, such as sandstorms, interrupt the production of a smooth inter-Asian space as imagined by corporations and the state. Taking a closer look into the corporate beginnings of the Silk Road economic belt, global tech conglomerate Hewlett Packard exemplifies a historically relevant agent in the development of supply chains with their most current involvement with Chinese state elites revealing how logistics is premised on a form of control, where the centralization of capital power in monopolistic companies rely on the state's cooperation in aspects of development. Hewlett Packard scaled up their operations to include monopolizing the entirety of their supply chain, where their moves contributed to the state's overall large-scale efforts to move industries towards the western, most arid parts of China. These networks form as a hybrid grown from China's reform-era politics, where the economy is controlled through state-led efforts. As the Chinese economy slows, technologies of zoning and logistical strategies become increasingly important. Infrastructural expansion rearranges cartographic space into nodes and events catering to strategies of controlled circulation and containment. These activities often lie paradoxical to the efforts of slowing the increasing environmental problems in the area. Distinctly intertwined with the securitizing and direct targeting of Xinjiang's Uyghur minorities, the increasing ecological unpredictability and societal ills from broken lands forms a different reality on the ground to that of so-called "liquid modernity" (Bauman 2000).

### Sedimented Elsewheres

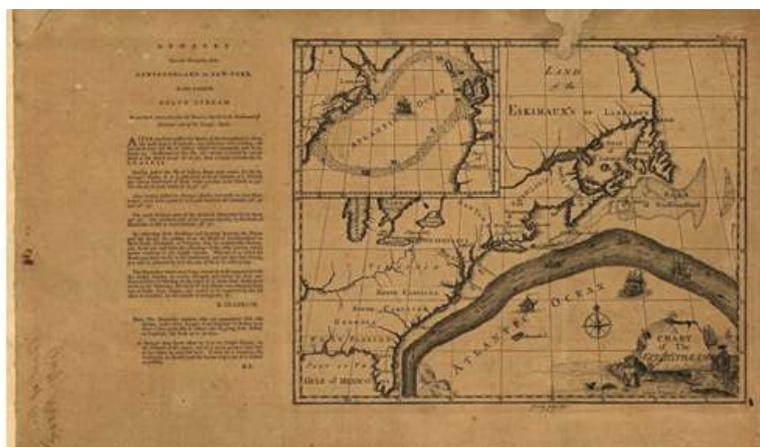


Fig. 2 A chart of the Gulf Stream, Benjamin Franklin, 1775. (Accessed from [www.raremaps.com/gallery/detail/34528/A\\_Chart\\_of\\_the\\_Gulf\\_Stream\\_with\\_Remarks\\_Upon\\_the\\_Navigation\\_from/American,15/04/17](http://www.raremaps.com/gallery/detail/34528/A_Chart_of_the_Gulf_Stream_with_Remarks_Upon_the_Navigation_from/American,15/04/17))

The trade-winds were originally labelled to mean “steadily in one direction,” with the term “trade” borrowed from the German language during the 14<sup>th</sup> century. While historically the word simply meant a way of life, a habitual course of action, it was during the 18<sup>th</sup> and 19<sup>th</sup> centuries that it took on the more familiar resonances—of business, a frequent practice of bartering (Online Etymology Dictionary, 2017). It was the trade winds which were truly responsible for the commencement of the global circulation of goods in the 18<sup>th</sup> century. The logic was that one had to understand weather in order to be able to extract its use value: “The oceans and the atmosphere form a nonlinear dynamic system that contains ten times more solar energy than plants capture through photosynthesis” (Delanda 2014, 53).

Benjamin Franklin’s maritime observations in 1785 drew the first maps that sought to encapsulate the relationship between turbulent waters and patterns within the currents of the Atlantic Ocean. He drew them while being Deputy Postmaster General of the Colonies, after hearing a complaint from the Board of Customs in Boston. Mail packets from England took two weeks longer to make the westward crossing than the Rhode Island merchant ships. Perplexed at this difference in time, he later found that the captains who were able to move faster were familiar with the Gulf Stream and were thus able to avoid it while traveling the westward crossing. The English captains, however, were not, and instead were being trapped in its currents while en-route (Carson 2014, 101). Like in Franklin’s maps, boundaries were drawn to involve calculations of the wind, its currents and directions in which would later be technically engineered in favour of the transatlantic slave trade. After-all, “the winds are the trade winds first and foremost.” (Leslie 2016, 12)

Here mobility, and control over mobility, reflect and feed back into reinforcing power. Imperialism, through its ability to observe atmospheric conditions, used wind and currents as force multipliers of trade, engineering it alongside managerial strategies of the supply chain. They were able to use these conditions to allow for cheaper modes of production and extraction elsewhere, while speeding up nationalist, transnationalist, and corporate interests within their imperial centres. The “intra-action” in the trade winds, between the atmosphere, its windy circulations, the ships, its captains, and their maps, colluded in what accelerated the uneven formations of a whole series of relations across vast bodies of water. These formations can be interpreted as what Barad writes of in *Agential Realism*, the reciprocated and active formation of objects and agencies of observation within phenomena; here, “individuals emerge through and as part of their entangled intra-relating” (Barad 2007, ix). These dynamic relations continuously brought into being many elements of our current modern political geography (Ahmed 2017).

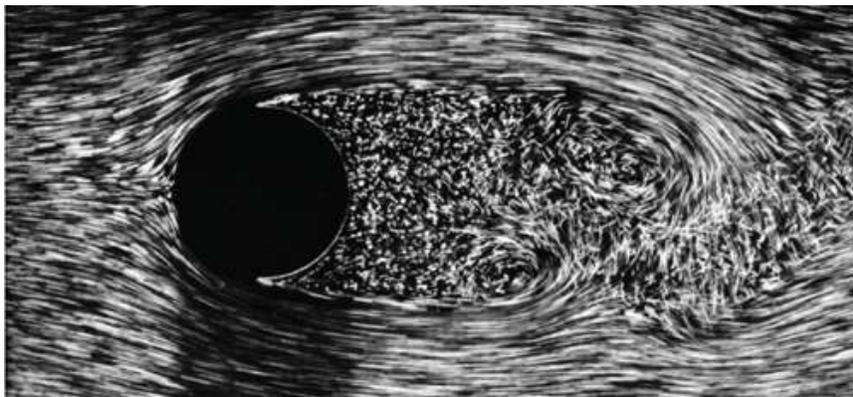


Fig. 3 Laminar flows break up into a turbulent wake, An Album of Fluid Motion by Milton Van Dyke, Department of Mechanical Engineering, Stanford University. (Accessed from [courses.washington.edu/mengr543/handouts/Album-Fluid-Motion-Van-Dyke.pdf](https://courses.washington.edu/mengr543/handouts/Album-Fluid-Motion-Van-Dyke.pdf))

The beginning of the 19<sup>th</sup> century marked a rupture in epistemology. With the rise of thermodynamics, theories from physics and mathematics popularized metaphors of flow or blockages of energy through thermodynamic systems, along with hydraulic metaphors of reservoirs and damming, as these concepts became essential in thought (Frow 2005, 120). With Newton’s invention of calculus, being able to predict nature and its behaviours through clean calculations gave humanity an apparently objective viewpoint (Barad 2007, 233). Grounding the modern subject, many such instances of methodological and ontological thinking featured linear temporality and spatial separation. Theorist Denise Ferreira da Silva writes that separability is the

perspective that all things of the world are able to be rationally understood through quantity, quality, relation, and modality, when gathered through space and time. Knowledge can be extracted through the understanding of its ability to be outlined, formalized, and made useful—allowing for truth claims to be deducted (da Silva 2017, 61). Symptomatic of a Cartesian split which privileged binaries, it produced hierarchies such as the mind over the body, where Western reason was defined by its clean boundaries. Claims of ownership and sovereignty over land to be exploited were the very foundations of modern state and law, with lines drawn separating human individuals and nature. This began what da Silva calls “a trajectory that would extend beyond the confines of knowledge to become the ruler of modern economic, juridical, ethical, and aesthetic scenes” (da Silva 2017). Along with the seemingly objective practice of science, the Enlightenment project of modernity fueled notions of mastery and possession through reason and intellect (Serres 2011, 32).

As da Silva articulates, “The emergence of modern science can be described as a shift from a concern with forms of nature, which prevailed in scholastic thought, to an inquiry into the *efficient* causes of changes in the things of nature” (da Silva 2017). Efficiency revolutionises operations on matter, through high temperatures, the calculus of thresholds, and of the transformations of phases allowing for new heights of energy to be accessed. It was during this era when the telegraph, steam-powered vessels, administrative reforms, manufacturing industries, and railway construction collectively amplified one another (Ghosh 2017, 102). With the arrival of carbon-fuelled technologies, flows do not have to rely on winds, as landlocked settlements almost as accessible as those by water (DeLanda 2014, 81). For example, the Imperial cotton and oil industry in Russian Turkestan was co-constructed along with the building of a Central Asian railroad network in the 1890s. The whole region became part of a single economy geared towards cotton production on a massive scale. This followed a distinct mode of upscaling, including immense projects on land irrigation, across long-distance networks, expanding the ambit of Russian imperial power and dynamics (Uryadova 2012, 5). Campaigns for modernization under later Soviet rule continued such large-scale plantations that in turn exhausted the region’s land and water networks, leading to devastating ecological effects (Kreutzmann 2016, 113). Western powers determined the shape of the global carbon economy through military and political presence in much of Asia and Africa, when steam technology was in its beginnings.

In the 1970s, firms in the Industrialized Global North were experiencing a downturn in profits due to the rising costs of production and wages, and sought cheaper production costs elsewhere. The answer was to return to older colonial modes of production, where seeking extraction and cheap labour sources internationally allows for profit value reaped in the north while offshoring production to the global south. Logistics originates as a military term, hegemonic on a global scale when the first shipping container was designed as a way for the US army to supply materials and arms in the Vietnam War (Charmaine Chua, Skype interview with author. May 05, 2017).



Fig. 4 Saigon, Republic of Vietnam, Douglas Kiser of the Vietnamese Welfare office arranges the loading into Sealand container trucks for shipping throughout the Republic of Vietnam under project HandClasp, National Archives D.C., 1972. (Accessed from Wesley Attewell, 15/08/17)

Together, these threads of inquiry demonstrate how environments have long been instrumentalized towards extracting value in ways which are historically contextualized. The managerial sciences of colonialism continued into logics that were later adopted by the Industrialized Global North, albeit construed through various ongoing geopolitical events. One event crucially being the U.S. involvement in the Vietnam War. During the burgeoning of the “military industrial complex” in the 1960s, new surges in state funding funnelled into developments relevant for military applications. Fluid mechanics emerged as a discipline extending from mechanical engineering that was dedicated to research for the designs of faster trains, jet engines, and re-entry physics for spacecraft and ballistic missiles. Eighty percent of graduates from these departments found employment in the defence industry (Wisnioski 2016, 103). It was at this time that nonlinear dynamics became popular amongst various fields of mathematics, physics and engineering. Spilling across disciplines, its equations of the Chirikov criterion or the Butterfly Effect became relevant from industrial design to meteorology (Holmes 2007). It was also during this period that the military science of logistics was developed and digitized. Designs of containers, along with IBM’s involvement in the development of a centralized network, helped usher in a transpacific militarization (Wesley Attewell, Skype interview with author, August 9, 2017). The supply chain management in Saigon was the first to be automated, streamlining decision-making processes which made the distribution of commodities extremely efficient. IBM-applied computer technology and calculations were supplied through cooperation with RAND (Wesley Attewell, Skype interview with author, August 9, 2017).

Here, the tracking and designing of flows expanded and contracted, moving between scales. Non-linear dynamics of climates scale into strategies of movement on ground, streamlines, and fluid dynamics into the efficient management of objects. “Scalability is, indeed, a triumph of precision design, not just in computers but in business, development, the ‘conquest’ of nature, and, more generally, world-making. It is a form of design that has a long history of dividing winners and losers.” (Tsing 2012, 505) The art of logistics was in the method deployed through dividing and supplying various forms of life (Wesley Attewell, Skype interview with author, August 9, 2017). From 1965 onwards, the Vietnam War’s military backlog allowed for faster mobilization, which transported commodities into Vietnam, mitigating bottlenecks (Wesley Attewell, Skype interview with author, August 9, 2017). But as these systems ran through experience, when implemented, scalable data along with its differences are reproduced. Hierarchies amongst racialized labour became more pronounced, along with the ability to mobilise certain U.S. power relations in South-east Asia. It was also claimed that the experiments in management led to the sudden boom of Asian economies, nicknamed the Four Asian Tigers (Wesley Attewell, Skype interview by author. August 9, 2017). Along with the Cold War and all its uncertainties, the time period nurtured a desire for U.S.-led technological advancement, to aim for “crystalline definiteness” of algorithms that could “cope with a world on the brink.” (Amoore 2018, 9). The increase of transnational mobility and geographical dispersal went together with resources for managing and servicing that network of movement. Calculations for the least amount of resistance across spaces—from a missile or the shape of the train—translates forms into quantifiable nodes and allows for these designs to further perpetrate global modes of production foundational to power dynamics today.

With the current global infrastructural project of the New Silk Road, the ordering of things are led by alliances between transnational corporations and the Chinese State. These alliances simultaneously produce frictions from their designs. While acknowledging that imperialism had crucially designed itself in relation to planetary currents such as wind, the contemporary state of imperialism is no doubt different. The New Silk Road traverses terrains which are amongst the most affected by climate change, with its long-distance infrastructures needing to be designed in ways to withstand increasingly erratic weather events.

## Uneasy States



*Fig. 5 Sand management methods along the Chongqing Xinjiang Europe rail-route, Solveig Suess, 2017*

A grain of sand is found, amongst many others, covering patches of the Chongqing Xinjiang Europe rail-route. Sand can find its entrance anywhere, potent with the ability to irritate and agitate things as solid as infrastructure. Despite algorithmic oversight, a relentless material disruption frequents the New Silk Road. Every grain carries the potential for interfering into the machinic workings of infrastructure on various temporal levels. The intense sand-carrying wind requires trains to be cleaned every three days, or it would have the power to corrode the surface of trains and fade its paint. Sand becomes an oxide after reacting with moisture on the ground, where it does not forget the industrial chemicals which meld into its chemical composition, nor the salt from its original bed (Chuanjiao and Chang 2015; Rahn 2007). Over a longer duration, it gradually wears down the tracks and train wheels (Windblown Sand Modelling and Mitigation Research Group 2016). Its material disturbances are happenings, unfolding into and (re) configuring the infrastructural framework.

Sand becomes an agent which troubles the totalising ambitions of the New Silk Road. Encountering sand and its erratic movements provoke a feeling of the “environmental uncanny”—striking a chord of familiarity with something we had once known, but cannot seem to remember how we turned away from. Eerie moments of sudden confrontation with strange weather remind us of “the presence and proximity of nonhuman interlocutors” (Ghosh 2017, 32). The landscape is a sentient entity, one without subjectivity, but nonetheless an entity, not a background. Our recently announced current geological epoch, the Anthropocene, describes shifts in the earth’s own physical processes as human activities have become the world-determining forces of change. But we should add that it is not just any human that produces change on this scale, but particular humans, perhaps of a specific mode of production and consumption, or a set of relations, maybe an assemblage of industrial and post-industrial high-carbon lifestyles (Choy and Zee 2015, 210).

In 2007, the press covered a hurricane-force sandstorm which derailed a train in the Xinjiang area. Some cars were knocked off the rails, others were left with cracked windows (The Associated Press, 2007). Each following year trailed with reports of similar severities, necessitating design modifications along its routes costing up to \$US 23 billion (Shepard 2017). All along the New Silk Road economic belt, the infrastructure rushes through vast landscapes which clearly suffer from high degrees of aridity. Its

landscapes are criss-crossed with various methods designed to keep dust and sand grounded, to prevent particulate matter from being mobilized by the winds, from transitioning its phase into suspension. Netted materials are pinned to the ground, both in grids and as vertical walls. Grids made out of stones create similar effects of catching sand. Many artificially planted trees dot the regions as their roots hug the ground. Train tracks undulate on and above ground, the heights determined by the intensities of the landscape's sand composition. 463 kilometers of windproof walls were built along the Gobi Desert stretch of the line, as well as the 3600 meter-high Qilianshan tunnel in Gansu Province (Shepard 2017). Delaying its future, governmental efforts have been organized to predict and slow the terrain's relentless movements eastwards, against the current of the Western economic tide. As each train carries around \$US6 million-worth of goods when heading towards Europe, strong winds remain a major threat to the rail-line, particularly around the Xinjiang-Lanzhou-Urumqi 710 kilometre stretch. The faster the trains, the more of a threat they become (Jia, 2013).

The sands are close reminders of the expanding deserts from the nation state's peripheries, Xinjiang and Inner Mongolia. The low pressures in the atmosphere over the Taklamakan and Gobi deserts create windy conditions in the area during late winter and early spring. Loose top soils are picked up by westerly winds, pulling these sands into an increasingly intense Asian dust storm (Phys.org, 2017). Freezing all activity in its path, such storms have become an annual occurrence, compared to half a century ago when each phenomenon struck only once every seven or eight years. The deserts are expanding roughly 1,300 square miles a year, with movements both fast and slow. Each grain of sand carries the potential to be thrown across thousands of miles with the storm (Mullany, 2017).

Over the past few decades, utopian social-agricultural experiments of high Maoist socialism have completely drained groundwater and many lakes across Xinjiang and Inner Mongolia. The Uyghur ethnic minorities of Xinjiang had previously used an extensive network of *karez*, a localized technique which had irrigated arid areas for millennia. These infrastructures were then replaced by large-scaled agricultural production used towards cotton plantations which resulted in its quickly receding water tables (Vanderklippe, 2017). Lop Nur, a lake that disappeared forty years ago, is now one of the four sources of sandstorms in China. Twenty percent of the country currently exists as desert, whereas in 1975 desert lands were 21,000 square miles smaller (Haner et. al., 2016). Anthropologist Jerry Zee writes that the mobile dunes of the deserts are "sites and material forms where we can trace emergent alignments of politics to the inorganic afterlives of the broken land" (Zee 2017, 218). The state-led ecological construction slogan in these areas speak of "blocking wind, holding sand" (*fangfeng gusha*), where it is through the control of sand's conditions, specifically in managing its transition between on-ground to in-air, which influences local environmental politics (Zee 2017, 232).

In a turbulent flow of agency, sandstorms irritate the calculated journey of the train. Rail-routes have been known to be riskier due to overland possibilities of local 'terrorist' insurgencies and extreme weather events, especially those which traverse deserts. They cannot be easily governed due to shifting lands. With China's rail-network spanning across a wide range of climatic zones, sandstorms frequently disturb routes like ones which cross the desert-ified areas of Xinjiang (UIC eNews 2017).

Trains crossing the Eurasian steppes are armed with guards stationed aboard, with a high-speed rail monitoring system actively sensing and monitoring for possible risks of a transition into turbulence—wind speeds, anti-intrusion, vibration, and geological disasters (Szyliowicz et. al., 2016, 154). Maintaining an all-encompassing algorithmic oversight while traversing westwards towards Europe, the route has become one of the most monitored areas within China. Algorithmic oversight of the rail-line operates by feeding data through numerous types of radio systems, inventory histories, and the internet of things, which in turn translate back into risk assessments and security protocols informing management procedures. As business advisory manager Wing Chu explains, "Today, most logistics operators are capable of monitoring the cargo during the whole process and provide the consignor with clearance on arrival at the railway terminus, warehousing, and trans-shipment to the desired destination" (Chu 2016). Just-in-time, precision management, and forms of regulation seek to calibrate the supply chain precisely towards predictive models for the destination of goods. Virilio writes, "modernity is a world in motion, expressed in translations of strategic space into logistical time, and back again" (Virilio 1986, 7). The political landscape is governed

by various and collaborating surveillance, mobilization, and fortification technologies, building a nervous attentiveness when movement and time are governed so tightly (Virilio 1986, 7).

Wind and its movements have not always been seen as a hindrance to production. Rather, one could say that in the inception of modernity was the ability to calculate and efficiently use all weather conditions towards capitalistic means. As outlined in the previous section, observing weather laid the groundwork for future techniques of predictive analytics. The project of optics and of observation came to shape the world in a particular formation which powered commerce, measurement, and forecasting, producing differences which matter. Taking cues from Karen Barad, carefully reading for such differences demonstrates how they are not predicated on conditions which are external to them but rather in entanglement, with effects produced as concrete in mattering and in material conditions. Without such an understanding and instrumentalization of weather, there would be no global capitalism as we know it. But increasing ecological disturbances signal an urgent need to shift our common-sense understandings and contemporary culture in ways which are both imaginary and epistemological. Climate change is amplified through dramatic environmental systems, resulting from the build-up of certain human practices, now acting as an agent of disruption feeding back onto those same practices. The replacement of the *karez* with state-led social agricultural experiments engineered the area of Xinjiang towards short-term benefits, with its lands now suffering from increasingly strange and unpredictable weather. Sand and its movements interfere, interrupt, and deviate the fluxes of logistics across contemporary Xinjiang province while simultaneously refining algorithmic calculations towards further control and efficiencies. Such technologies which fixate themselves on control and the absorption of contingencies, fold into larger societal shifts and formations of communities.

### Turbulent Drag



Fig. 6 Still taken from a Russian logistics company, AvtoGSM, employee surveillance camera, 24/03/15. (Accessed through [www.youtube.com/watch?v=pt2lGOQnj\\_s](http://www.youtube.com/watch?v=pt2lGOQnj_s), 03/02/17)

In the wake of slowing economies, geographies of supply and demand currently spread themselves across vast spaces in mutable forms. Capable of absorbing peripheral communities at the edges of markets, logistical networks assist the drive of states and corporate conglomerates to continuously seek the extraction of capital in places otherwise untouched by its capture. As Virilio notes, layers of people and things move faster, driven by the “competitive advantage of speed” (Virilio 1986, 9). Speed fuels economic production towards distribution, and maintains a level of metabolic intensification in central nodes or global cities (Virilio 1986, 14).

Used now as a tool to stave off slowing economies by “bringing the outside in,” 由外至内 (youwai zhinei), a catchphrase amongst planners of the New Silk Road economic belt, reinforces the logistical and infrastructural as a new method of governance (Eyler, 2015). When recasting geographies

of law and violence through the arranging of the inside and outside of state space, actions like land grabs, military actions, and dispossessions are all part of its territorial reconfiguration (Cowen 2014, 102). Deregulated environmental and labour laws offer legal independence from the domestic laws of the host country through the creation of zones: “The zone typically provides premium utilities and a set of incentives—tax exemptions, foreign ownership of property, streamlined customs, cheap labour, and deregulation of labour or environmental laws—to entice business” (Easterling 2015, 10). Within the Chinese Communist state system, zoning technologies are devised as a distinctive way to re-territorialise national socialist space whilst generating a controlled development of capitalism (Ong 2004, 72).

In the case of the New Silk Road, the transnational company Hewlett Packard initiated the inter-governmental negotiations for saving two weeks-worth of transportation time (Shepard, 2017). It was seen to be an alternative to the Pacific Ocean route, which was filled with chokepoints and perils. This followed a move made by the company, as well as others including Foxconn and Volkswagen, to shift their factories towards China’s western border (Abe, 2014). As part of the “Go West” program, state-led encouragement was offered to develop these western regions. The western regions are also the location of large amounts of energy and mineral resources, including coal and iron ores from the politically troubled Xinjiang Uygur autonomous region. With more speed and less cost of transporting Chinese-made goods to western markets, large incentives allowed transnational corporations like Hewlett Packard to leverage geopolitics in their favour (Frankopan, 2015). The Hewlett Packard-initiated rail-route later became part of the Chinese state’s centralised framework of the New Silk Road Economic Belt initiative in 2015, ironing out any potential issues with bottlenecking (Yin-nor 2015, 112).

There is a particular characteristic of scalability which remains faithful to the universalist notion whereby a singular, global conquest of a certain knowledge moves objects and peoples. This unified ideal sways and naturalizes the idea of expansion. Scalability appears across various forms throughout the supply-chain, where to be “scalable” is to be expandable without needing to rethink basic elements (Tsing 2012, 505). A common tactic of neoliberal global capitalism, or large transnational corporations, scalability describes what Rob Nixon calls “geographies of concealment in a neoliberal age” (Nixon 2009, 444). By its design, difference is disguised in homogeneity, occluding troubled relations within transnational spaces with a sheer glaze of shared modern ambitions of efficiency.

From scalabilities, Hewlett Packard was also the first western company to incorporate Japan’s pioneering industrial methods of supply chain management. Hewlett Packard influenced the U.S. military industrial complex to embed their standards within America’s domestic policies (Weiss and Schoenberger 2015, 69). In post-war Japan, Toyota pioneered supply-chain management by moving production outside their sovereign borders, coordinating space and time through a more cost-beneficial manner. As a flexible production technique, just-in-time (J.I.T) management aimed to shave off expenses and optimize, where possible, through various methods of tweaking. This technique standardized a rhythm of labour throughout the production line, with working hours described by Stefano Harney as a “killing rhythm of labour” (Wesley Attewell, Skype interview with author, August 9, 2017). It globalizes an acceptance of working the body at a rate which physically and mentally destroys it over time (Wesley Attewell, Skype interview with author, August 9, 2017). As an *Economist* article reports, “One study found that American firms that introduced J.I.T gained over the following five years (on average) a 70% reduction in inventory, a 50% reduction in labour costs and an 80% reduction in space requirements” (Tim Hindle, *The Economist*, 2009). Such expansion of micromanagement practices tracks and traces, finding points of drags in time and space which then inform overall operational decisions. J.I.T management pioneered a rationalization which seeks calibration of work throughout the whole body of the supply chain (Cowen 2014, 196).

Efficiency is implemented through different scales within strata of inventory lists to political economic agreements along the New Silk Road railway. Thousands of laptop computers and accessories are piled neatly in these sealed shipping containers to travel across the New Silk Road three times a week. Borders have also shifted, with the train route’s security checks displaced. Fulfilling ambitions of free-trade, a two-day wait for a ten percent physical container inspection has been eliminated because of the Eurasian Customs Union Agreement, allowing for goods to instead travel freely through Russia, Kazakhstan, and Belarus. Time is shaved through a shortened transit duration; inventory lists are reduced, leaving less room

for complications. Objects placed in inventories are effectively tracked, allowing for quick calculations to channel profits and organize the commodity chain. In these digital spreadsheets and inventory lists, labour and environmental conditions where theft or violence are also part of the production process are siphoned off as excess. Neoliberalism is an agent of general equivalence.

Hewlett Packard negotiated with the Chinese government to implement their own border customs software for processing documents, permitting its containers to instead stay locked and un-inspected at border crossings *en route*. This allows for the inclusion of cargo inspection, quarantine, and customs clearance to occur in one stop (Chu, 2016). One does not have to look far to see that the flow of goods and capital means the arrest of movement for others. In 2016, the Uighur ethnic minorities of Xinjiang were told to hand in their passports to local authorities for “examination and management”; the area had been heavily policed for forms of separatist activity. Police checkpoints dot the area, targeting local inhabitants during the duration of the developmental works (Al Jazeera 2016). Since the development of the New Silk Road economic belt, the faster trade through these overland lines means more restrictions and containment for the Uyghur minorities in the area. The area is filled with checkpoints interrupting movement every few kilometres, providing only the surface of the extremities of the police occupation and colonization in the province as big as France and Germany combined. Deborah Cowen writes that the neoliberal management of life and death and its anti-political calculations, cost-benefit analysis, and market-driven logics embed themselves in the most minute of measures. Time and space are designed with technologies of efficiency and standardization, eliminating resistances including possibilities for political claims or ruptures. The management and security of the life of the whole supply chain is crucial, not just the population it serves (Cowen 2014, 231). Ethnic-specific targeting occurs on various levels as part of the close watch of the state. This includes anything from identity and mobile phone screenings, WiFi sniffers, cars with compulsory tracking devices, to one meter of resolution available through satellite imagery. Xinjiang is currently the test-zone for the entire country’s artificial intelligence operations.

The fantasy of logistics, and where it accumulates its power, appears as the all-encompassing smooth operator, adept at hiding the fact that it needs friction in order to stay in business. Friction, in Anna Tsing’s view, is the awkward, unequal, and unstable force which “refuses the lie that the global operates as a well-oiled machine” (Tsing 2015, 6). Understanding these global points of friction is exactly what allows Hewlett Packard to maintain its market dominance, where what is at stake for them involves finding logistical solutions towards keeping costs low. Speed, then, is engineered across frictions traversing between the body and continents. Hewlett Packard’s innovations for the New Silk Road aligned with the national interests of the Chinese state in that these joint plans assisted the westward movement of industries. This is an increasingly serious collaboration, as the mitigation of risks involves both the violent arresting of the Uyghur population along with the increased deterioration of the lands. The implications of these logistical calculations are disturbing ecologies as well as societies. It is with this urgency that these processes need to be seen together as two sides of the same coin.

**(Re)configuring Flows**

*Fig. 7* NASA's Aqua satellite took a photo of a dust storm blowing over the Taklimakan Desert in China, 01/02/14. (Accessed from <https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=51705>, 02/07/17)

This paper has mapped logistical media through its intra-actions with weather across various scales. Backgrounding with the epistemological shifts that came with different forms of forecasting and measurement, particularly of thermodynamics, the notion of efficiency has led to specific geographic modes of production, distribution, consumption, and dispossession. Long-distance networks of transportation, initially wind-dependent, later connected scalable operations of production through networks of steamships and railways, expanding the ambit of what is possible for global logistical capitalism. With the development of the military industrial complex during the Cold War underwriting a lot of how current transnational configurations are forged, notions of efficiency continue to reproduce violent Cartesian separations between human individuals and nature across its spatial and temporal orderings. Together, they demand we interrogate fundamental logics to how we make sense of increasingly strange weather—knowing that these storms do not merely trouble global scale ambitions, but that they are as much part of it.

Here, sandstorms obscure the military, scientific, corporate, and state alliance matrix with their agencies. The various temporal disturbances in which sand affects the railway and its supporting infrastructures bring forth unscalable relationships that actively reconfigure these global flows of capital and goods. As sandstorms assert themselves as an undeniable threat to the infrastructure of the New Silk Road, it folds and reorganizes corporate and material histories and futures, generating their own sets of desires, contradictions, and political and economic logics. Particulate matter finds its way of creating friction within ideal states of smoothness, influencing new programs focused on the management of risk geared towards protecting the corpus of the supply chain. The turbulent nature of sands and winds are able to interrupt the continuous fluxes of logistics but also, at the same time, increase and refine their algorithmic overview towards a more efficient control.

Referring to Hewlett Packard's history of supply chain logistics, their current collaboration with Chinese state elites is crucial in understanding newer forms of logistics today. Hewlett Packard based its innovations on points of friction for keeping its industry dominance. As the New Silk Road is currently one of the most ambitious ongoing infrastructural projects in the world, it is important to observe such points

of friction as they feed back and reinforce the supply chain as a whole. The corporation's involvement with infrastructural and material conditions includes repercussions which are both environmentally and socially devastating. The calculations for speed and the least amount of resistance exceeds into biopolitical control of the local Uygher population and increasingly strange weather in Xinjiang Province. Studying tech firms like Hewlett Packard through the lens of logistical media enables increased attentiveness to the logics of organization that bear such spatial and temporal implications. With the engineering of immediate time and space, the long-term, delayed effects of industry and capital form what Rob Nixon would call a temporal disjuncture—an out-of-sync (Zee 2017, 218). These sandstorms force-multiply cruel differences inherited through an amalgamation of global-scale industrial, modern, and capitalist practices.

The increasing nervous attentiveness to weather prediction within these regions coincide with the province as a testbed for algorithmic governance. While western colonial projects functioned differently to Chinese state-led experiments, both fundamentally imply a dismissal of other forms of logistical organization. This can be seen through the denial of older methods of irrigation, such as the Uygher *karez* technique, in parallel with systemic destruction and colonial dispossession by the Chinese state. The sheer scale of control which Chinese state-elites have over various territorial decisions places is further evidence of the current urgency to examine these trans-corporate and state infrastructural collaborations. Decisions made by these collaborations shape broader hegemonic parameters coordinating a wide range of material settings, such as ports, warehouses, transport, and even university and military operations. Efforts to recognize interconnections between more-than-human scales of logistical media are crucial to finding commonalities among struggles to unite along the supply chain.

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