Geographies of Connectivity in East Africa:

Trains, Telecommunications, and Technological Teleologies

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Ladies and Gentlemen,

I am gratified to be with you today at an event of truly historic proportions. The landing of this fibre-optic undersea cable project in Mombasa is one of the landmark projects in Kenya's national development story.

Indeed some have compared this to the completion of the Kenya-Uganda railway more than a century ago. This comparison is not far-fetched, because while the economies of the last century were driven by railway connections, the economies of today are largely driven by internet and other I.C.T. connections.

- *Former President of the Republic of Kenya, Mwai Kibaki* (Kibaki, 2009)

Introduction

The early twenty-first century has witnessed much excitement about the hugely transformative effects of rapidly changing communication and transportation technologies. Politicians, journalists, and academics have all argued that technological advancements are enabling new and unprecedented types of economic, social, and political connectivities and relationships. The 'death of distance' (Cairncross, 1997), the 'space of flows' (Castells, 1996), the 'global village' (McLuhan, 1962), 'time-space compression' (Harvey, 1990), the 'network society' (Castells, 2004), and myriad other ways of imagining space/time reconfigurations have all been used to make sense of changing connectivities and positionalities.

But, long distance and trans-continental connectivities have for much of recorded human history been technologically mediated (McNiell and McNiell, 2003). A range of transportation and communication technologies have allowed otherwise unfathomable distances to be charted, navigated, and reimagined (Hugill, 1999). Imaginations and practices of connectivity have always been integral to the enaction and co-creation of economic and cultural identities and

relationships. Not only is the organisation of connectivity and spatial relations crucial to the enaction of specific modes of colonial or contemporary capitalist production (Lefebvre 1974), but so too are the ways that non-proximate connectivity is imagined and thus ultimately brought into being. As such, the ways in which these technological fixes are, and have been, imagined matter. Therefore, tracing understandings and discourses of connectivity is crucial because formulations of connectivity often underpin highly normative discourses that legitimize specific political actions, or excuse certain inactions.

This paper contrasts the revolutionary power ascribed to contemporary technologies of connectivity with those of previous moments in order to ask how links between non-proximate places are created and imagined. It specifically does this by opening up some of the ontological assumptions that are embedded into popular imaginations of changing connectivities and positionalities. In doing so, the paper asks how presentations of possible and probable power-geometries (Massey, 1993) can either open up or close down spaces of possibility. We examine this topic through one traditionally marginal, and marginalised, part of the global economy at two moments of radical change: namely, East Africa in the late nineteenth century and the early twenty-first century. The Uganda railway was constructed from 1896 to 1903 between Mombasa and Lake Victoria (see figure 1 and 2). The infrastructural project aimed to fundamentally alter the ways in which parts of the East African region were connected to one another as well as to the wider world. The railway was financed directly by the British exchequer on the basis that it would serve as a strategic measure to bar the expansion of other European powers into the region. As such the railway was a product of the Scramble for Africa among rival European powers. During the partition of Africa ideas of railway connectivity assumed a crucial

importance. The inter-European conferences on Africa held in Berlin in 1884 and Brussels in 1890 had formally declared railways the most effective means of fighting in-land slave trade while it was widely agreed that any economic development – whether based on agriculture, mining or tourism – required investment in new transportation and communication lines (Wesseling, 1996). Yet, with little external trade in the region the Uganda railway was established with the expectation that it would create new economic activities to recoup its substantial investment costs (Hill, 1957; Gunston 2004). This mix of strategic and uncertain economic rationale meant that the railway project became the subject of public and parliamentary debates in Britain. Moreover, the railway's role in the founding of Nairobi, the fact that it was built mainly by indentured labour from India as well as the highly publicised incident of man-eating Tsavo lions all contributed to a particularly rich textual body which developed around this engineering project. The railway therefore constitutes a privileged window for analysing discourses of technological connectivity in the context of colonial East Africa. The railway of nearly 600 miles cost £ 5.5 million (roughly £450 million in 2013 figures), making it comparable with the investment in the fibre-optic cable project a little more than a century later.

Figure 1. Mombasa-Victoria (Uganda) Railway and Busoga Railway, The Director of Surveys, Nairobi Government Printers, B.E.A (1913)

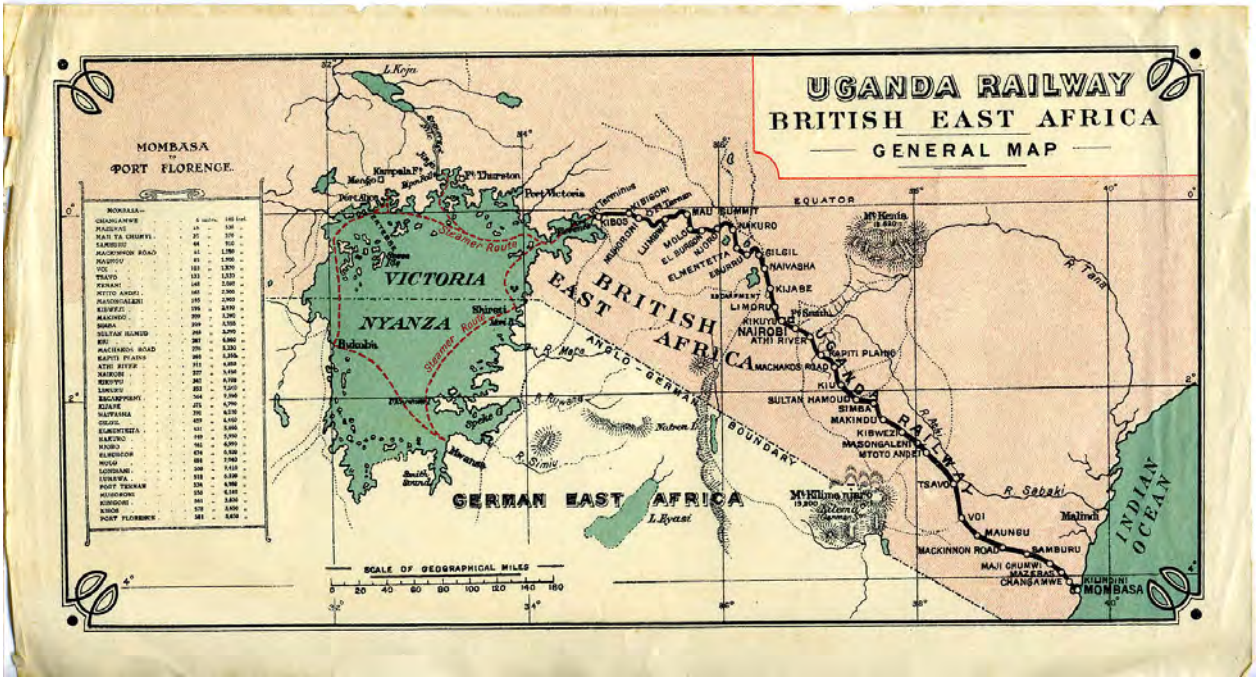
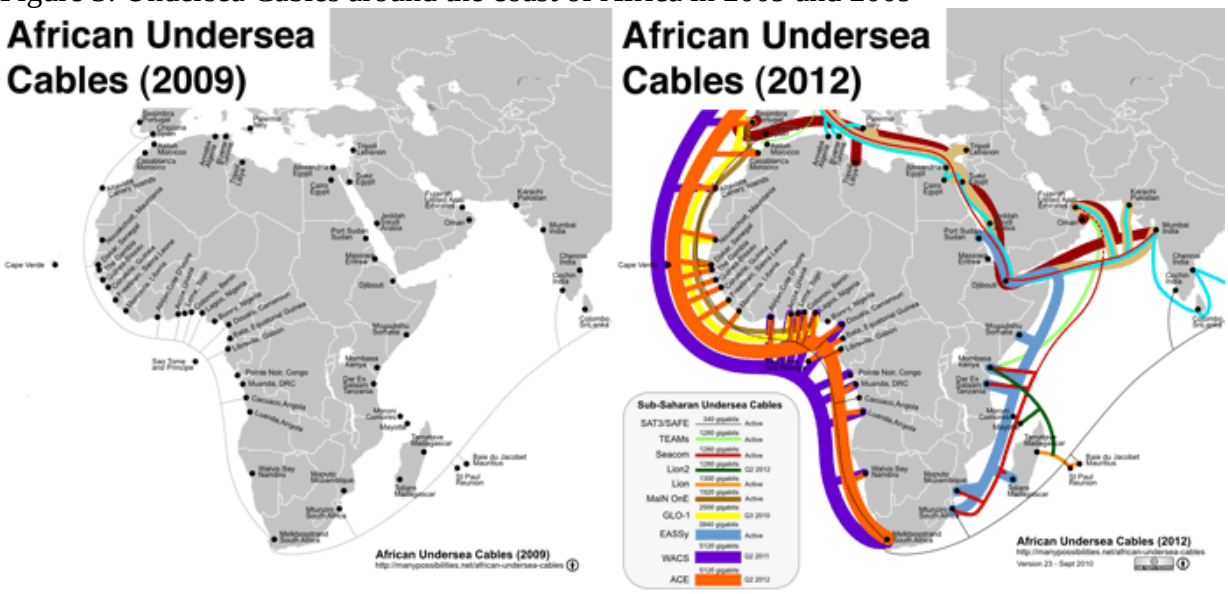


Fig 2: Indian workers in East Africa levelling the ground for the railway track c. 1900. Source: 'Photographs of British East Africa belonging to Arthur W. Read'. Arthur W. Read was an engineer on the Uganda Railway. Reproduced by courtesy of the Bodleian Library of Commonwealth & African Studies at Rhodes House.

By the beginning of the twenty first century and with the rising ubiquity of digital information, new technological fixes have become necessary for places to be considered well-connected; namely, access to fibre-optic cables (Chaffee 2001). These cables allow for information and communication to be quickly and inexpensively transmitted throughout the globe, making the infrastructure a seeming prerequisite for places wishing to engage in international economic

activities like business process outsourcing (BPO) (Malecki, 2002; Graham, 1999). In the early twenty-first century, East Africa was the last major part of our planet disconnected from these fibre-optic cables. However, after much work and over a billion dollars of investment (largely through public-private partnerships), the first of five cables landed in the East African ports of Dar Es Salaam and Mombasa in the summer of 2009 (see figure 3).

Figure 3: Undersea Cables around the coast of Africa in 2009 and 2009



Until this time, East Africa had recorded extremely low rates of ICT access and use (Moodley, 2003; Thioune, 2003), and had some of the highest data costs in the world due to the heavy reliance on satellite connections. The new connection was seen by many to be a hugely transformative and revolutionary event. Presidents, ministers, CEOs, and journalists all described how connecting the previously disconnected would not just enable desirable social, economic and political change, but also alter East Africa's position and positionalities in a globalised economy. Specifically, many governments like Kenya's and Rwanda's justified their expenditure in the cables and the corresponding domestic internet backbones as a necessary means to engage in international flows of outsourcing and other digitally enabled service-based work.

A comparison of the historical and contemporary cases allows us to make two important observations. First, we can see that many of the expectations ascribed to technologies of connectivity are not new. This observation might seem unremarkable, but is nonetheless important in the context of contemporary tendencies to view the Internet and digital communication technologies as revolutionary and without historical precedents. More important, we see particular technological teleologies in accounts from both contexts that ascribe agency and inevitability to connectivity. Connectivity is seen as something that 'wants', 'makes' and 'does' rather than as grounded relationships between people, places and processes. By viewing connectivity in such a manner, the ways in which powerful processes and relationships, such the imperial or neoliberal projects, are brought into being are potentially ignored.

Second, we see significant shifts in the ontological assumptions between the two periods. The historical moment's focus rested on a shrinking of distance and a connecting of cores to peripheries that would integrate an empire and open up new lands to imperial ambitions. The contemporary moment moved to a dominant conceptualization of connectivity defined by co-presence in a 'flat world' or 'global village' bringing new people into a shared economy (Friedman, 2005; also see critiques by Christopherson et al., 2008; Ghemawat, 2011). This monolithic conception, in turn, offers a powerful justification for the neoliberal project, by presenting integration with *the* global economy as ineluctable. By pointing to the powerful ways that connectivity is presented and represented, we are able to see how discourses on technologically-mediated connectivity are able to shape our imaginations of what is and is not possible.

Changing positionalities and technologies of connectivity

Before more closely examining the ways that connectivity has been envisioned and understood in both the historical and contemporary cases, it is useful to briefly review how technologically mediated connectivity has been more broadly described and envisioned. Technologies have always influenced how people experience time and space (for historical accounts see Kern (1983) of Standage (1998)). One of the most powerful and persuasive ideas that has been used to explain the intersections between technologies and connectivity, has been the notion that technology can render geography obsolete. Geographic frictions and spatial barriers to interaction are explained away with ideas that distance is dead and that the only limits to connectivity are our imaginations (e.g. Cairncross 1997; Couclelis 1996). Abler (1975, 40), for instance, wrote about “complete time-space convergence - a situation in which no differences in the time required to reach near or distant points exist - shrinks areas to points." Solnit (2003, 4) points out that a wide variety of technologies, such as photography, telegraphy, rail, telephony, and even the phonograph have long been seen as instruments for “annihilating time and space.” McLuhan similarly (1964, 4) described a vision of how "the world has become so compressed and electrically contracted, so that the globe is no more than one village."

Such ideas have a long history, with different technologies in different time periods, heralded as the killers of distance. In the late-nineteenth century the idea that railways were ‘annihilators of space and time’ was commonplace – even a cliché lampooned by critics of industrial modernity and the utilitarian ‘time-table mentality’ which they saw as the product and legacy of the ubiquitous railways (Carter, 2004; Schivelbusch 1977). Geographers also debated how railway

connectivity altered spatial understandings. In a 1928 article the economic geographer, Mark Jefferson, for instance, drew up maps of the world in black and white according to the density of railway connections. The white colour of the maps of Western Europe and Britain showed that connectivity had advanced so far that it made up a *railwayweb* with the "the civilizing rails" having all but eliminated the backwoods areas with its peasant ways. According to Jefferson the railway was "the agency that for the century past has done more than any other single one of man's inventions to transform human life, especially in the way of pushing backward people forward and lifting submerged classes (Jefferson:1928: 217-8). The complex discourses of railway connectivity were further accentuated in colonial contexts (Adas, 1989). In Africa railway construction began late and the continent was usually portrayed as the final frontier in what one of the most influential popularisers at the time dubbed "The railway conquest of the World' (Talbot, 1911).

While notion of progress through connectivity has remained prominent in public discourses, there have, however, been strong scholarly rebuttals to the idea that technologies of connectivity could result in a death of distance (Castells 2002; Dodge and Kitchin 2001; 2011; Gorman and Malecki 2002; Knowles 2006; Townsend 2001; Zook 2000). The main line of critique is that instead of enabling the death of distance, sociotechnical networks have always represented geographies of "enablement and constraint" (Law and Bijker 1992, 301). Stephen Graham (1998, 179) similarly argues that technologies of connectivity can never eliminate spatial difference because "rather than simply being space and time transcending technologies, telecommunications systems actually act as technological networks within which new spaces and times, and new forms of human interaction, control and organization are continually constructed." In other

words, by focusing on the metaphors of time-space compression and a shrinking world, we ignore many of the complex relationships between capital, technology, and space. Space is not ubiquitously shrinking, but is instead continuously being reconstituted and reformed. This perspective "allows us to reveal the socially contingent effects of new technologies, the way they are enrolled into complex social and spatial power relations and struggles, and the ways in which some groups, areas and interests may benefit from the effects of new technologies, while others actually lose out" (Graham 1998, 176). These socially and spatially contingent effects of technology are integral to two conceptual tools (power-geometry and positionalities) that we employ to understand how the effects of altered connectivities on East Africa are framed and discussed.

"Power-geometry" is way of focusing on the ways that technological fixes to time and space have never been introduced in an even or equitable manner. Different forms of time-space compression need to be differentiated socially by asking which groups benefit most from reconfigurations caused by technologies of connectivity in different periods and places. In her description of 'power geometry', Doreen Massey (1993, 61) argues that:

> "Different social groups and different individuals are placed in very distinct ways in relation to…flows and interconnections. This point concerns not merely the issue of who moves and who doesn't, although that is an important element of it; it is also about power in relation to the flows and the movement. Different social groups have distinct relationships to this anyway-differentiated mobility: some are more in charge of it than others; some initiate flows and movement, others don't; some are more on the receiving end of it than others; some are effectively imprisoned by it"

Massey thus contends that by utilizing the concept of power-geometry, power is recognized both as reflected and reinforced by mobility and as a form of control over mobility. By recognizing these facts, we are able to develop a politics of mobility and access that allows us to focus on

how the relative mobility and access to technologies of connectivity of one person, potentially furthers the spatial imprisonment of others who have less power over mobility (for instance, the ways that the hypermobility of capital can weaken the bargaining power of relatively immobile workers (Harvey 2006). Massey (1993, 63) concludes that "conceptualizing space, mobility and access in a more socially imaginative way, and abandoning easy and excited notions of generalized and undifferentiated time-space compression, might enable us to confront some of these issues rather more inventively".

Building on Massey's formulations of the interactions between power and connectivity, Sheppard (2002) uses the notion of 'positionality' to focus on power relationships in discussions of technologically mediated connectivity. He notes that positionality is used to capture "the shifting, asymmetric, and path-dependent ways in which the futures of places depend on their interdependencies with other places" (Sheppard 2002, 308). We find the concept useful in this paper because it allows us to articulate some of the complex and parallel considerations of electronic and physical propinquity. Ultimately, by drawing on the ways that technologically mediated connectivity have been described and envisioned, possibilities are opened up for understanding the ways in which non-Euclidean positionalities and their associated power-geometries are an integral part of the experiences and understandings of connectivity. They similarly allow us to conceptualise space as something that is not just a container of connectivities, but instead something that is partially stabilised and produced out of heterogeneous connectivities (Murdoch, 2006). Subsequently, we closely examine two moments of highly transformative change in East Africa's history to focus on the descriptions of perceived

positionalities, and the types of power-geometries to which those visions of changing connectivities ultimately pay any attention.

Methods and sources

Our approach is based on a "realist" understanding of discourse of analysis which recognizes the importance of the material resources that enable discourses to reproduce and enact change in the social world (Parker 1992, 1; Howarth 2000, 9-12). The underlying assumption is that what is said about technologies cannot be separate from what technologies do. Importantly, we employ discourse analysis in order to identify how language matters without reducing sociotechnical processes to crude social determinism. The paper draws on two types of source materials in order to interrogate discourses surrounding these important moments of changing connectivity in East Africa. In the contemporary case, we employ a media content analysis to capture some of the most visible and prominent voices. The sample was developed to be broad enough to cover a potentially diverse range of discourses and themes, yet small enough to be handled qualitatively so that not only manifest content but also latent meaning could emerge from the analysis (Shoemaker & Reese, 1996:32). We therefore made use of keyword searches in the Lexis-Nexis online database in order to select media accounts of the arrival and perceived impacts of the fibre-optic cables on East Africa. Specifically, we identified articles that mentioned broadband internet in close proximity to either an East African country or one of the fibre optic cable providers. The end result was a sample of 378 international and East African media reports about the landing of the cables. We supplemented these texts with an interrogation of the national development plans of all East African nations and speeches given by heads of state about the arrival of fibre-optic cables.

For the historical case, we analyzed primary texts from the late nineteenth and early twentieth century about the construction and aims of the Uganda railway. This included journalistic accounts, travel descriptions and discussions among British expatriates and administrators in East Africa as well as debates in learned societies in Britain. Thus, the analysis is confined to the coloniser's view on the effects of railway connectivity. This reflects that it was the British who defined the purpose of an infrastructural project that people in the East African region had not asked for. It was the hopes, fears and economic expectations of connectivity among the British which contributed to the prevalent discourses around the railway project.

The accounts from both periods necessarily draw heavily on privileged and visible voices that have been afforded platforms for their opinions about altered connectivities (for instance, the prominence of the cables' backers in the reports). But it is these very voices that are afforded the most visibility and prominence in both time periods and ultimately allow us to historicise powerful understandings of technologically mediated connectivity in East Africa. Specifically, we analysed texts to answer two core questions: *how have changes in connectivity framed East Africa's imagined positionalities and relationships with the rest of the world?* and second, *What has connectivity itself meant to the politicians, policy makers, and opinion shapers in both contexts?* Following Miles and Huberman (1994:34) we adopted three strategies to better understand the analytical boundaries of our subject of enquiry: (1) selecting apparently typical/representative examples; (2) selecting negative/disconfirming examples; and (3) selecting exceptional or discrepant examples.

Hopes, Fears, and Expectations of Change

In order to understand how the effects of altered connectivities on East Africa are framed and discussed in both the contemporary and historical contexts, we focus primarily on stated expectations for change in all of our sources: dividing our discussion into a focus on *hopes* and a focus on *fears*. This is done as a strategy to explicitly seek out counternarratives, as we initially expected that those with much to gain from promulgating techno-optimistic perspectives would be employing very different framings from those that express more pessimism.

Hopes of change

In 1902 in the Society of Arts in London, Commander of the Royal Navy, Benjamin Whitehouse spoke under the headline 'To the Victoria Nyanza by the Uganda railway'. Whitehouse was the brother of the chief engineer to the railway, which in 1902 was approaching its delayed completion. According to Whitehouse the establishment of the rail link connecting Mombasa and Lake Victoria marked a revolutionary shift in the history of the entire East African region. He noted that no railway has ever 'caused such changes in the country through which it passes" and emphasised that "until other lines are constructed the whole trade of that part of central Africa must come to it" (Whitehouse 1902, 229, 233).

In the ensuring discussion the gentlemen in the audience expressed their agreement with Whitehouse. The chairman at the London meeting, the renowned explorer Henry Morton Stanley, explained that Whitehouse's lecture had reminded him of a vision he had had during his first expeditions to East Africa in the mid-1870s:

> I seemed to see in a vision what was to happen in the years to come. I saw steamers trailing their dark smoke over the waters of the lake; I saw passengers arriving and disembarking; I saw the natives of the east making blood brotherhood with the natives of the west. And I seemed to hear the sound of church bells ringing at great distance afar off. (Papers of Sir George Whitehouse, Box 11).

The lofty visions of a transformed East Africa revolved around a substantial imperial infrastructural project. From the inception of the project, this railway was construed as marking a clear temporal dividing line in the history of East Africa. At the core of this notion lay the assumption that barbaric isolation was giving way to civilised connectivity. In the popular weekly *The Graphic*, Whitehouse claimed that 'in pre-railway days people going from Mombassa to the interior had to put together a caravan consisting of animals that rarely survived for long and of carriers who usually deserted' while people now 'could travel through to Lake Victoria in comfort on-board first-class sleeping carriages'. A journey that had previously taken anything between three and six months could now be made in four days (Papers of Sir George Whitehouse, Box 11).

The young Winston Churchill – who was among the most influential of the Uganda railway eulogists – took the theme further in two articles he contributed to *Strand Magazine* in 1907 and later published as the book *My African Journey*. Churchill's description of the journey he took from Mombasa to Lake Victoria on the Uganda railway set the 'wilderness of Africa' in contrast to the order and progress that the railway connection had brought about:

> What a road it is! Everything is apple pie order. The track is smoothed and weeded and ballasted as if it were London and North-Western. Every telegraph post has its number; every mile, every hundred yards, every change of gradient, has its mark […] Here and there, at intervals, which will become shorter every year, are plantations of rubber, fibre and cotton, the beginnings of those inexhaustible supplies which will one day meet the yet unmeasured demand of Europe for those indispensable

> commodities. Every few miles are little trim stations, with their water tanks, signals ticket-offices, and flower beds complete and all of pattern, backed by impenetrable bush. In brief, one slender thread of scientific civilisation, of order, authority, and arrangement, drawn across the primeval chaos of the world (Churchill 1908, 35).

According to Churchill development in East Africa required the breaking down of isolation through the establishment of technological connections:

> I would go so far as to say that it is only wasting time and money to try to govern, or still more develop, a great African possession without a railway. There can be no security, progress, or prosperity without at least one central line of rapid communication driven through the country (Churchill 1908, 12).

The railway as a demarcation line between past and present in Africa was central to late-Victorian ideas of progress and economic development. In the 1850s David Livingstone famously identified the three C's of Christianity, Civilisation and Commerce as the levers that could lift Africa out of its alleged barbaric state. A quarter of a century later the establishment of infrastructure was often identified as the missing component in this Livingstonian programme, adding we can say, a forth C of connectivity. (Andersen 2012).

Strategic and geopolitical priorities played an important role in the decision to construct the Uganda railway. However, after construction began, economic considerations became increasingly important. According to most commentators, the railway would create new opportunities for trade and settler agriculture; by allowing entrepreneurs to transport produce to export markets (notably cotton and coffee) and to import capital goods, new areas could be opened to capitalist economic activity. Private trade and industry were thus the driving forces of economic development, but were often dependent on public investment into infrastructure, as in the case of the Uganda railway. The *East Africa, Uganda and Zanzibar Handbook* published by

the Colonial Government of British East Africa in 1905, expressed the high hopes for future economic development after railway connectivity had been established:

> Scientists are developing the natural resources of the country, prospectors are searching for gold and precious stones, planters and settlers are cultivating the rich soil of the highlands, and the civilising effect of missionary enterprise is making itself felt among the natives. It is to be hoped that, by careful management and proper supervision, the Protectorate will before long become self-supporting and form an important part of the British Empire (Government of British East Africa 1905, 45).

Imaginations of the role that technologically mediated connectivity could play in East Africa re-emerged with the arrival of fibre-optic cables into the port of Mombasa in 2009. Hopes of what these changing affordances might bring into being were perhaps most confidently summed up by David Rowan (2011), the editor of *Wired* magazine:

> If you want to become extremely wealthy over the next five years, and you have a basic grasp of technology, here's a no-brainer: move to Africa. Seriously. The internet is only now arriving, and -- with a billion people on the continent still mostly offline -- there exists a once-in-a-lifetime opportunity to build the next Zyngas, eBays and Groupons for a huge untapped local market. You need only look at the map of huge broadband fibreoptic cables currently being laid…to understand how quickly and ambitiously an entire continent is being connected.

More broadly, the arrival of fibre-optic cables was framed as an essential and much-needed infrastructural change for East Africa. BBC reporting on the cables' landing contained a series of anecdotes about how fundamental social, economic, and political change was now possible with the new connectivity afforded to the region. For instance, one prominent BBC story reported that: "Africa's potential is being hindered by the absence of fast internet connectivity and this technological advance will open new avenues" (BBC 2009a).

The belief that this new connectivity would result in transformative change further permeated other reports about the landing of the cables. The Ugandan *Independent* newspaper, for instance, led a story on the arrival of the cables with a quote from Cisco's (one of the world's largest manufacturers of networking equipment) representative at a launch event: "We will change the way Africans work, live, learn and play with the rest of the world" (Powell 2009). Kenya's President, Mwai Kibaki, engaged in similarly optimistic visions in the Kenyan ceremony to mark the landing. Kenya's *Daily Nation* reported that:

> President Kibaki said the project, which will see faster global connectivity will stimulate economic growth. "The project has connected our country with the rest of the world and harnessed the power of Information Communication Technologies. This is a great enabler for growth, and development of our country" (Daily Nation 2009)

The economic effects of the cables have been particularly touted by Tanzanian President Jakata Kikwete. The East African Business Week ran a story in which he claimed that "a farmer will be able to sell their beans as far as [former Venezuelan] President Hugo Chavez's kitchen easily when they link-up with a buyer on the other end" (Kisambira 2009). In other words, the cables would radically reduce or remove frictions to economic trade: even with parts of the world that traditionally have relatively little contact with one another.

But not only would altered connectivity change economic topologies, it would also bring about the development of fundamentally new types of economic activity: specifically, the growth of new (and high-tech) industries such as business process outsourcing (BPO) in the region. *The East African* newspaper, in a piece on the promises of the regions new connectivity, wrote "the three marine cables will enhance competition in business process outsourcing, considered the

vital link to the rest of the world" (Ngunjiri 2010). While colonial expectations around the railways pivoted on improved access to raw materials and commodities, the expectations of fibre optic connectivity emphasise opportunities for more skilled East African labour.

Online BPO platforms such as Guru, Elance and Amazon Mechanical Turk promise companies access to a "global pool" of freelancers and promise individual workers access to "global work flows." These sites are often mentioned in the popular media as evidence of a flattened world economy. In the mid-2000s, prior to the arrival of the cables, Kenyan workers began gaining piecemeal work from these online sites and as a result, more established businesspeople began to invest large sums in professional BPO operations in expectation that the cables would be built. In many ways it was the hype surrounding the arrival of fibre-optic connectivity that helped to induce many of the hopes that we saw about Kenyan participation in a 'global' BPO sector (Graham and Mann, 2013).

In sum, examining the hopes for altered connectivity in both contexts demonstrates that visions of radical change brought about by altered technological affordances are nothing new. New technologies have been seen as not just assemblages that allow for faster, cheaper, and more efficient movement of people, goods, information, and ideas, but additionally as a force that *will* change the very positionalities of places. Connectivity itself is seen to have its own agency, and, as such, the power-geometries that it is envisioned to bring about are assigned a particular type of inevitability. As such the view implies what Bimber has labelled a nomological understanding of technological determinism, the idea that technologies, which evolve autonomously, necessarily determine the future course of social change (Bimber 1994). But the particular hopes between the

two periods vary substantially. In the historical moment, the focus was squarely on the utilisation of land under white leadership, whilst the contemporary moment's focus centred on connecting producers and consumers through trans-national markets. We return to the question of how these differences matter later in the paper.

Fears of change

Despite these high hopes, there have also been worries and fears about altered experiences of connectivity. As the railway was construed as a 'thin line of civilization' driven into East Africa, the fear most frequently aired was that imperial control would be hard to maintain. Without continual maintenance, British influence would dwindle and the region would fall back into a state of disconnectedness and seclusion. According to Churchill 'the African wilderness' posed a constant threat to the influence of the rail link:

> Every clearing is intensely overgrown with sinuous plants. But for the ceaseless care with which the whole line is scraped and weeded it would soon become impassable. As it is, the long fingers of the encroaching forest are everywhere stretching out enviously towards the bright metals. Neglect the Uganda railway for a year, and it would take an expedition to discover where it had run (Churchill 1908, 56).

This fear, however, was quickly pushed aside, with the Churchillian dictum 'build more railways'. This need was also emphasised by others. According to Charles Hindlip, 'the [railway] line was absolutely necessary for opening up East Africa'; he feared that 'if East Africa as a country succeeds and comes up to the scratch, the present metre gauge line will be quite

inadequate to handle and carry the produce, and the Government and the tax-payer have, I fear, not heard the last of the misnamed Uganda Railway (Hindlip 1905, 27, 30).

However, while those who reported back described the railway as an assured road to economic progress, critical voices railed against this crude technological determinism. In particular those who had settled in British East Africa for longer periods felt that the fixation on connectivity overshadowed other and more pressing concerns. Charles Eliot, British Commissioner to the East African Protectorate and resident in Nairobi during the construction period argued in 1901 that the railway

> has somewhat unduly monopolised public attention to the exclusion of other interests in East Africa…I think it would be financially more advantageous both for the Protectorate and for his Majesty's Government if it recognised that the prosperity of a railway depends on the prosperity of the country through which it passes. There seems to be a tendency to treat the railway as something apart, built in the air so to speak and independent of terrestrial things. But in reality a railway is intimately connected with its surroundings. It is the backbone of the East Africa protectorate but a backbone is as useless without a body as a body is helpless without a backbone (Papers of Sir George Whitehouse, Box 11)

For Elliot connectivity was at best a first step but one that threatened to absorb all attention and all available resources. Another administrator explained that 'along the Line, dozens of white settlers are quickly changing the face of the land' but that the understaffed Government was 'quietly working away in some far off locality, trying to introduce …, more profitable ways of cultivating the ground, more efficient ways of cutting roads and making bridges, and so maintaining communication and trade with other localities' (H. R. T[1]. 1904, 46). There was a fear that economic development would be confined to a narrow strip of land along the rail line and fail to spread to the other areas of the colony. Other commentators took such criticisms one

[1] The author has stated only his or her initials.

step further. H. G. Prout, influential editor of the *Railway Magazine*, was pessimistic with regards to the Uganda railway, which he claimed passed through unhealthy and thinly populated areas with little potential fields of commerce and industry. In Prout's view the path to what he called 'the economic conquest of Africa' was short payable railways lines serving well-defined needs relating to agriculture and mining. Such conditions were missing in the case of the Uganda railway (Prout 1900).

The contemporary fibre-optic cables have been framed by a more rounded sense of optimism surrounding the region's new communications capabilities. Among commentators, there was less concern about the maintenance of the infrastructure and more concern about how the newfound connectivity and removal of barriers might expose the region to new threats. Interestingly, none of these concerns were voiced by East African leaders, which focused so heavily on hopes for the future. Instead, it was left to the media to express their fears of change.

The *Business Daily* noted that "The expected faster connectivity and more bandwidth capacity is likely to see more firms increase their online presence, leading to a rise on e-attacks given that most companies and individuals lack adequate security measures" (Mark, 2009a). These worries are not based on hollow threats, as the Kenyan government found out in in 2009. The Kenyan *Daily Nation* reported that:

> There is a dramatic increase in hacking of websites in Kenya. In the past year a number of websites have been compromised…When the government website http://kenya.go.ke, was broken into, it was turned it into a promotion portal for Viagra, the sex enhancing drug (Nyabiage 2009).

A related fear of the enlarged influence of external actors, was again expressed by the *Business Daily*; with the paper expressing concern that new connectivity might serve as a conduit for the transportation of wealth and resources out of the country:

> Just like the region watched in awe as the Kenya-Uganda railway transported away our raw materials, increased internet connectivity that is expected to come up with the fibre optic capable is likely to open up the region for exploitation by clever entrepreneurs in developed countries unless our people are sufficiently sensitised about the opportunities that it entails," - David Owino, the Kenya Data Networks' chief operating officer. (Omondi 2009)

Concerns about the vulnerabilities of global integration were likewise expressed in articles focused on the lack of local management and engineering talent needed to manage and maintain the cables. *The East African* reported: “As soon as anything unexpected happens they are lost. Who will be the first to have comprehensive fibre training in a massive scale in East Africa? There will not be local people to build all what is coming” (Comstedt, 2009). The *Daily Nation* similarly argued “it will be a challenge for Kenya to manage the huge broadband capacity given the shortage of skills and local content. Seacom's [the owners of one of the cables] entire system will be operated and controlled through Seacom's network operations centre in Pune, India” (Mwiti 2009).

A second core concern related to the idea that while East Africa had constructed its core backbone network, it still lacked sufficient secondary infrastructure to distribute this new connectivity to geographically dispersed populations. The *East African* ran a 2009 story titled ‘The cable is here but EA is not ready for it’ in which the broader dissemination of connectivity was expanded on: “East Africa may have received the first undersea fiber optic cable a month

ago but it is emerging there is no requisite infrastructure to enable Seacom go deeper into the hinterland" (Riungu 2009). The *East African* (Comstedt 2009) story mentioned above even employed a railway metaphor to make its point:

> So from having just a dirt road carrying hardly any vehicles, offering tickets at prohibitive prices, we all of a sudden have a high-speed express train with extremely convenient and low-cost seats. This sounds good but a few problems do remain. The biggest one is that it is not available where you are, only on the beaches of Mombasa, Dar es Salam and Maputo. It doesn't even dare to make land in Somalia and it is far away from landlocked Uganda and Rwanda.
>
> The second is that it costs money to organise the sale of tickets on this express train; sales agents (or telecom operators) have to take the risk of buying a whole carriage to ride for the next 20 years and then sell individual seats to get the prices that everyone is excitedly expecting. And you only wanted to read your email cheaply this evening?

The *BBC* (2009b) also expressed concerns in one of its pieces about the landing of the cables, noting that: "our correspondent says it is not clear whether the internet revolution will reach the villages, many of which still struggle to access reliable electricity" (a sentiment echoed in Figure 4: a cartoon that was printed in Kenya's *Daily Nation*).

Figure 4: "Fibre Optic" by Godfrey Mwampembwa

Source: http://gadocartoons.com/fibre-optic/ (permission to reproduce this image has been obtained)

In a few cases, social and demographic factors were also mentioned as hindrances. The *Business Daily* made the case that "at least three in every ten Kenyans may never have the opportunity to access the Internet due to low literacy levels, age and attitudinal barriers" (Mark 2009b). The *BBC* similarly argued that:

> Very few Kenyan households even have an internet connection and not many own a personal computer - indeed, there are just three million internet users in the whole country, out of a total population of close on 40 million…For all the talk of opening up access to broadband, this could end up being one big white elephant (Makeni 2009).

Whilst the historical moment saw a debate among leaders about the limitations of changed connectivity, the contemporary moment largely saw leaders refrain from criticism. Most expressed fears not about the connectivity itself, but rather about an incomplete or uneven revolution. In other words, commentators were primarily worried that positionalities were not being altered quickly enough. The issue was not that changing connectivity would fail to bring about the changes that so many ascribe to it, but rather that those changes would either be unevenly distributed or – in some cases – have harmful effects. Few commentators deviated from the idea that changing connectivity, for better or worse, was not just highly transformative and extremely powerful, but also inevitable.

The primacy of connectivity.

In the previous section we closely examined hopes and fears associated with altered connectivity in East Africa. This section focuses on how the idea of connectivity itself has been envisioned and understood in both cases by politicians, policy makers, and opinion shapers in both contexts.

In 1900 the idea that poor connectivity hampered ‘progress’ in Africa was not new but it increasingly came to be emphasized as the defining characteristic of the continent: “The outstanding feature of Africa, has been its inaccessibility” declared the baron and consulting engineer to the *British South Africa Company* Sir Charles Metcalfe, in the *Royal Geographical Society* in 1915 when he spoke on *Railway Development of Africa, Present and Future.* Metcalfe insisted that it was only in recent decades that ‘inaccessible Africa ha[d] been made accessible through the efforts of explorers, missionaries and shipping companies, private companies and governments and their engineers’ (Metcalfe 1915, 5). The idea that disconnection was the defining feature of Africa implied an attractive openness for different agents to emphasize different effects of improved connectivity to different audiences. These effects ranged from humanitarian hopes (such as the ability of railways to eradicate the Arab slave trade in East Africa) to the improved economic exploitation of resources associated with connectivity. The primacy of connectivity also fitted into a number of economic expectations and interests of different industries such as mining, agriculture and tourism.

Commentators agreed that the Uganda railway would fundamentally alter distance and proximity as well as East Africa’s place in the world. To Churchill and many others, connectivity meant linking East Africa to an economic circuit that allowed the region to take its place as a supplier of raw produce in an economy centered on Britain. It was anticipated that the connectivity created by the Uganda railway would lead to increased white settlement in the “healthy highlands” where agriculture, trade and mining would thrive under substantial immigration from Europe.

This Churchillian view fit comfortable with a centre-periphery understanding of the colonial relationship. Yet others saw the changing positionality created by railway connectivity as primarily about establishing a link between East Africa and British India. In 1899 the special commissioner to British East Africa, Harry Johnston, stated that the Uganda railway meant 'the driving of a wedge of India two miles broad right across East Africa from Mombasa to the Victoria Nyanza. Fifteen thousand coolies with 'some hundreds of Indian clerks, draughtsmen, mechanics and policemen are implementing the use of Hindustani Language, and carrying the Indian Penal Code, the Indian postal system, Indian Coinage, Indian clothing, right across these waters, deserts forests and swaps, tenanted hitherto by wild native savages or wild beasts" (Quoted in Oliver 1957, 293). As Thomas Metcalfe has demonstrated (Metcalf 2007), the Indian influence on the railway reveals how British East Africa from the 1890s was as much a colony of British India as of Britain itself. Recognising this well-documented Indian link is important because it points to the existence of multi-layered colonial understandings of positionality that go beyond binary centre-periphery ideas.

Another layer was added to the colonial understandings of positionalities by the idea that the Uganda railway was, ultimately, a branch line to the Cape to Cairo railway: the imperial vision of creating 'an all British Iron Spine' from which the ribs of commerce and civilisation could branch out across Africa. Usually attributed to Cecil Rhodes the idea of the Cape to Cairo railway dominated British discourses of African connectivity for several decades. Indeed most African railways in this period were heralded as links in the Cape to Cairo system, including the Uganda railway, which was regarded as one of the most important ribs of the iron spine (Weinthal 1924; Merrington 2004). British settlers and capitalists in South Africa backed this

vision. In this interpretation of altered positionality, the Uganda railway established proximity between Southern and Eastern Africa by connecting British settler groups, whom had previously been disconnected. The "South African" interpretation of altered proximity was captured well in 1906 by Sir Lewis Mitchell, a director of the *British South Africa Company*:

> practically nobody, in this age of progress can say to us 'thus far shalt thou go, and no farther… I see, as in a vision, a thread-like serpentine double rail athwart the entire continent. South to North I see the coloured races being conveyed to and from labour centres in health and comfort. I see our crowded and over-crowed areas here pouring out thousands of white men, to build, as Mr. Rhodes wished, "more homes" under brighter skies and happier conditions. (Mitchell 1906, 99-100)

By establishing railways between the agricultural and mining areas situated along the inland regions of the continent, East Africa would be linked to British colonialist influence advancing northwards from the south.

Visions of altered East African positionality thus reflected three competing notions about the Imperial core. Many commentators emphasised that the railway would link East Africa more efficiently with Britain itself. A second group saw the railway as linking East Africa to the Indian Ocean empire of the Raj. Finally, others stressed that the Uganda railway would become part of the Cape to Cairo railway system and thereby link East Africa with Southern Africa. The idea of opening East Africa by means of railways clearly encompassed divergent conceptualizations about the changing positionality of the region. Yet, despite these marked differences, there was a fundamental agreement on the primacy assigned to connectivity itself and hence, of the role of technology as the fundamental driver of change.

The President of Rwanda, Paul Kagame, expressed this idea clearly in Rwanda's 2006-2010 five-year development plan, which was written in anticipation of some of the changes brought about by fibre-optic cables.

> Just as it is clear that growth in the 19th and 20th centuries was driven by networks of railways and highways, growth and development in the 21st century is being defined and driven by digital highways and ICT-led value-added services. In Africa, we have missed both the agricultural and industrial revolutions and in Rwanda we are determined to take full advantage of the digital revolution. This revolution is summed up by the fact that it no longer is of utmost importance where you are but rather what you can do – this is of great benefit to traditionally marginalized regions and geographically isolated populations." (Kagame 2006)(5).

Kenya's national development plan, *Vision 2030,* similarly holds up infrastructure as a way of fundamentally reconfiguring positionalities. The document boldly predicts that "by 2030, it will become impossible to refer to any region of our country as remote" (Government of Kenya 2007, 6). Similar sentiments were voiced by the former President of Kenya, Mwai Kibaki in a speech given at the Mombasa landing of one of the fibre-optic cables:

> Thanks to I.C.T. the world now is truly a global village with better communication and now better informed. I am confident that timely solutions to the ongoing economic crisis will be found using the crucial tools of I.C.T…[we] are finally joining what the American author Thomas Friedman called a flattened world (Kibaki 2009).

Rwanda's long-term national development plan, *Vision 2020,* contains very similar language about communication infrastructure and perceived proximity. The document repeatedly refers to the country's landlockedness, before expanding on the need to address the issue with a technological fix: "For future developments, sufficient importance will be attached to communication in its large sense and in whatever mode, to facilitate the opening up of the

country, to increase productivity and to expedite the reconciliation and development process" (Republic of Rwanda 2002, 33).

In both cases, we have seen that connectivity implies not just a diminishing role for the frictions of distance, but a reduced importance of geography itself. Distance is seen as a central friction to economic development and integration, and altered connectivity is therefore offered up as a bridge over which one might transcend those spatial barriers. Importantly, this bridging in both periods is often perceived to occur, not because of a more rapid transference of atoms or bits from one place to another, but because of visions about the potential connections that could form between different places as a result of connectivity.

Yet through examining how connectivity itself is presented in both the contemporary and historical cases, we also witnessed shifts between the two time periods, a move from enrolling distant lands into the imperial project to one that focused more broadly on establishing a shared global market-space. We can therefore observe curious differences in the way power-geometries are presented despite the fact that both accounts ascribe technology with the power to change positionalities. In the historical case, railways were seen as the most effective means of breaking into a previously secluded continent and connecting it to wider economic circuits. While the historical case offered a moment in which the focus on reconfiguring power-geometries centred largely on their embeddedness within an empire's need for labour and raw-materials, the contemporary case presented an even more expansive vision. By focusing on the ability to enroll East African laborers and consumers in global markets, the contemporary moment offered a vision of connectivity that enabled peripheries to not just connect to *a* core, but rather *the* core.

Deconstructing connectivities: From Shrinking Worlds to Global Villages

The work presented above allows us to make two important observations. First, despite contemporary tendencies to describe digital communication technologies as without historical precedent, and thus harbingers of revolutionary change, visions that technology will radically change positionalities and shrink distance in the world's economic margins are not new. Among leaders of earlier periods, it is noteworthy that they were more willing to express reservations about the transformative potentials of technologies of connectivity in public. Fears were expressed of an inability to make the railway function as expected (i.e. an inability to tame Churchill's "African wilderness"), and a worry that new connectivities themselves might fail to achieve desired economic and political impacts. On the whole, however, commentators in both periods expressed an overwhelming sense that technologies of connectivity would have profound impacts on human positionalities.

In both cases, particular types of agency were frequently ascribed to technology as the key factor determining the course of social and economic development. Connectivity was seen as something that 'wants', 'does' and 'changes' rather than as something that grounds relationships between people, places and processes. By assigning agency to connectivity, the very real ways in which powerful processes and relationships (such as colonialism or economic globalisation) are brought into being are potentially ignored. Furthermore, ascribing new connectivities with associated economic and political change allows (and allowed) those forms of change to be ascribed an air of inevitability: a teleological trick that serves to depoliticize the very processes that technology, and the changing connectivities that it is thought to enable, mediate.

In other words, despite the fact that space and time are always social constructions, and always measured, imagined, and classified in contingent ways, there has been a consistent move to present space and time as objective and ontologically stable dimensions that will be shrunk by technological advancements. This observation in itself is not particularly novel as Marx (1973, 538) argued that "while capital must on one side strive to tear down every spatial barrier to intercourse…it strives on the other side to annihilate this space with time." What is particularly noteworthy is the way that this narrative has been consistently rewoven into descriptions about East Africa's changing connectivities.

Second, we are able to observe a distinct change in how power-geometries are envisioned between the historical and contemporary moments. The historical moment's, *shrinking world* imaginary focused on changing power-geometries centred largely on the ability of technology to integrate an empire and open up new lands to imperial ambitions; whereas the contemporary moment's *global village* imaginary focuses instead on how East African producers and consumers would be enrolled and enlisted into *the* global economy. The assumptions wrapped into these singular visions of connectivity encourage a diversion of attention away from the myriad local contingencies of the village, and into a more monolithic conception of the 'global village.'

Conclusions

Discourses of connectivity do not simply describe how different people and places are connected to one another. They also prescribe the effects that those changes in connectivity

ought to have in the world. That is, the discourses analysed in this paper have the power to shape not just how we envision connectivity, but also how we enact it (Fairclough, 1989; Blommaert, 2005). From a discursive standpoint, there is an emphasis on connectivity's agentful power to alter positionalities, while the specific interests and constituencies that drive these decisions and changes are able to be 'backgrounded' and even erased (Fairclough, 2000). It is in this sense that connectivity can be nominalised, insofar as the agency, the responsibility, and the ends of those in control of processes of technological upgrading can be discursively obscured and thus effectively concealed (Machin and Mayr, 2012). As such, there remains a need to understand the ontological underpinnings of dominant discourses around technology and connectivity: so that we might ultimately begin to understand the work that those imaginations of connectivity can do in the world.

The *shrinking world* imaginary of time-space compression can be traced back to the earliest telecommunication technologies. Proponents, opponents, boosters and cynics, built many of their arguments from the same foundations: that technology would reduce or remove frictions between cores and peripheries. Warf (2008: 12) has argued “discursively, colonialism was closely associated with an increasingly dispassionate Western view of time and space.” The *shrinking world* imaginary that we see is clear example of how space and connectivity were conceptualised under Eurocentric terms: thus facilitating processes and practices of control.

An obvious outcome of ubiquitous connectivity would be Marx’s (1973) annihilation of space by time or Abler’s (1975) ‘complete time-space convergence’. Yet even the most ardent enthusiasts for the *shrinking world* imaginary have recognised the fact that stark geographic inequalities in

access to technologies of connectivity continue to exist. A multipolar world of cores and peripheries thus allows connectivity to be a way of opening up Sheppard's (2002) wormholes between specific people and places and facilitating specific transfers of citizens or commodities. Said differently, in this model of connectivity, "no matter how much geographic space is shrunk by cost, or 'collapsed' by time, it always forms the underlying platform, the backcloth, upon which things of the human world exist and move" (Gould 1991: 5).

Opening up, flattening, and shrinking within the confines of the contemporary moment's *global village* imaginary posits a very different world and provides us with a very different meaning of connectivity itself. Here the wormholes are not between different places, but rather between the sites of connection and a new friction-free ontic space that exists beyond the material world. This space can be conceived of as both an ethereal, alternate dimension which is simultaneously infinite and everywhere (because everyone with a connection can enter), and as a realm fixed in a distinct location, albeit a non-physical one (because despite being infinitely accessible, all willing participants interact within the same marketspace, civic forum and social space) (Graham, 2011; 2013; Jurgenson, 2012). It is likely that one of the reasons for this shift occurring is a shift from speaking about connectivity as the ability of people and products to come into proximity with one another towards conceptualising connectivity as the movement of information: a much more ephemeral and intangible idea.

But the *global village* imaginary also follows a long tradition of dualistic worldviews (as opposed to monistic ones)[2] (Wertheim, 1999). Descartes, for instance, separated reality into the *res*

extensa (the realm of corporeal substance and matter) and the *res cognitans* (the ethereal realm of thoughts and non-material, spiritual existence). But it is only in the 'Internet-age', that the dualistic worldview has been so tightly enmeshed with technologically-mediated connectivity. Connectivity here is therefore something very different from connectivity as framed by the *shrinking world* imaginary. It entails not just removing frictions between a network of places, but bringing into being a new spaceless place; a global village that is simultaneously everywhere and nowhere. In both the *shrinking world* and *global village* imaginaries, distance dies: in the former by reducing frictions, but in the latter by setting up a virtual dimension detached from place itself.

Importantly, there is one powerful implication of this move from conceptualizing connectivity not just as enabling a simple shrinking of distance, but as affording co-presence and a shared virtual space. Namely, that we now have a world that is no longer defined by cores and peripheries, but a flat world and a 'global village.' It is easy to see how the historical moment's *shrinking* world supports various facets of the imperial project: affording the core greater control over the peripheries. Building on this notion, we could argue that the contemporary moment's *global village* similarly offers a useful justification for the neoliberal project. Imaginations of a flat world contain inbuilt assumptions about the need to join the rest of the world (in the *global village*) and, concurrently, the futility of attempting to enact any alternatives to the rule of the global market.

This understanding might explain why we saw so few contemporary voices expressing alternate possibilities or challenging the view that technologies of connectivity may be doing

anything other that bringing everyone and every place that they connect into *the* global economy. Presenting space as a container that can be shrunk and connectivity as inevitable has led to rather narrow conceptualisations of Massey's (2005) power-geometries. We see very little focus on the fact that "time-space compression for some may be time-space expansion for others" (Warf 2008, 11). In other words, we see little discussion of who actually benefits from, and is left out of any economic reconfigurations. By supposing teleologies of connectivity, dominant discourses about technologies of connectivity are able to shift the terms of discussion about changing positionalities and power-geometries: presenting connectivity as a replacement for proximity (and the benefits or harms associated with proximity), and leaving little space for myriad alternate imaginations and possibilities that can be associated with changing connectivities.

In conclusion, the broader significance of our argument is that conceptualisations of connectivity, and their associated spatial imaginations, matter. This empirically-grounded contribution has shown that conceptualisations of connectivity have been built upon significantly different ontological underpinnings in both historical moments. The story is more nuanced than the 'death of distance' versus 'geography still matters' debate that has, until now, charaterised much of the debate. The paper has therefore pointed to the powerful work that the *shrinking world* and *global village* conceptualisations are able to do in the world (i.e. supporting the colonial or neoliberal projects).

As such, the paper has demonstrated that historical and contemporary perceptions of improved connectivity are imbued with ideas about geography that pay little attention to the

diverse power-geometries and positionalities of different East African actors. The myriad social, economic, environmental and political contingencies of East Africa evaporate in an ontological move that presents space as a container in which distance can be shrunk, or even eliminated, in the case of the fibre-optic cables. These imaginations of the ability of technology to cause spatial reconfigurations are important because they present space as a bounded container in which Euclidean geometry can be warped by technology, but mostly ignore a Masseyian understanding of power-geometry. In other words, they operate under the assumption that technology alone can alter the many economic, social, and political connectivities that are constantly enacted and brought into being.

This paper might be viewed as a beginning from which we can launch more sustained inquiry into the discursive effects of the powerful and particular ways that we envision the coming-together of technology and connectivity. We have demonstrated how changing and mediated power-geometries can be concealed in technological teleologies, but there is much still to do. Technology has spatially and temporally contingent effects that are too often concealed by the fantastic and futuristic predictions that seem to accompany every moment of technological upgrading. As such, by deconstructing technological teleologies and by tracing the ability of particular spatialities to justify both the imperial and neoliberal projects, we hope that we have contributed towards creating more nuanced, more grounded, and more historicised understandings of the coming-together of technology and connectivity.

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