

Article

Tilting at 5G Towers: Rethinking Infrastructural Transition in 2020

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Abstract

5G has the potential to expand the horizons of digital inclusion by providing higher speeds, lower latency, and support for more devices on a given network. However, mis- and disinformation about 5G has proliferated in recent years and stands to be a persistent barrier to the adoption of this generation of wireless technologies. After rumours linking 5G to Covid-19 emerged in the wake of the pandemic, isolated actors attempted to disrupt infrastructure with a perceived connection to 5G. Media coverage of these incidents inadvertently spread such claims, engendering lasting uncertainty about 5G. Infrastructure scholars have long held to the maxim that “the normally invisible quality of working infrastructure becomes visible when it breaks” (Star, 1999, p. 482), but efforts to interpret the uptake of mis- and disinformation have struggled to define the technical difference 5G makes and describe diffused acts of anti-5G sentiment that exploited its slippery symbolic associations. What broke to make 5G so visible? This article reassesses interference with infrastructure through the lens of a literary metaphor derived from Miguel de Cervantes’ epic novel *Don Quixote*. Using the Don’s famed joust with windmills, I examine what efforts to disrupt the development of 5G in 2020 can tell us about infrastructural transition. With reference to Quixote’s tilt, I contend that the disruptions of 2020 illustrate conflicting imperatives of inclusion and exclusion underlying neoliberal schemes of telecommunication development.

Keywords

5G; conspiracy theory; Covid-19; disinformation; infrastructure; misinformation; standardization; technical standards; telecommunications

Issue

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1. Introduction

A pair of tweets from the final days of 2022 illustrate the vexed position of 5G wireless technology today. On December 17th, @liz_churchill7, an account associated with People’s Party of Canada activist and self-proclaimed conspiracy theorist Liz Churchill, posted that “inside these ‘vaccines’ are RNA modifying nanotechnology...that connects YOUR BODY to 5G (Pentagram)...which receives signals from CERN 666...and said ‘Super Computer’ that powers CERN is called ‘The Beast’...CERN is located on the former Temple of Apollo” (Churchill, 2022, original punctuation). The day before, online humourist Dril said more succinctly: “5G was supposed to get us all Laid” (Dochev, 2022). The intersection of expectation and fantasy, of

banal overhype and lurid imagination, illustrates the uncertain status of 5G in the years after the Covid-19 pandemic. Consumer demand has reduced, especially compared to 5G’s predecessors (Gross, 2022a), corporate investment has declined (Friedman, 2022), and lingering suspicion of this new generation of telecommunication technology remains in popular consciousness. To take one example, recent polling found that as many as one in ten Canadians believe that “Covid was caused by the rollout of 5G wireless technology as electromagnetic frequencies undermined immune systems” (Monopoli, 2022). From innocuous technical terms to pandemic flashpoints to muted commercial jargon, 5G captures a waning faith in the infrastructures of shared social life and the flawed mechanisms that sustain these inclusions. Yet to follow the course of this divestment, it

is necessary to dispense with 5G as a fixed signifier and reinterpret the actions of its opponents as more than mere ignorance. To do so, I make three critical moves. First, I begin by offering a practical assessment of the difficulties of defining 5G as a discrete discursive object of mis- and disinformation. As a novel technical standard for a new generation of telecommunication technologies left to the whims of corporate marketing, there is significant slippage in the application and saliency of 5G. Second, I review existing scholarly and journalistic literature on mis- and disinformation about 5G in 2020 in light of this complexity. Though comprehensive, the exigencies of the pandemic make these efforts necessarily limited. Third, I develop a literary metaphor derived from Miguel de Cervantes' comedic epic *Don Quixote* to reassess interference with perceived 5G infrastructure documented throughout Europe and North America in 2020. I turn to an interlude in the misadventures of Don Quixote, his famed joust with windmills, which I deploy as a heuristic lens to better understand the symbolic significance and social contradictions embedded in infrastructure. I place this reassessment in dialogue with the turn toward infrastructure in contemporary media theory and conclude with a consideration of what interference with infrastructure in 2020 can tell us about infrastructural transition. By synthesizing studies of mis- and disinformation, literary criticism, and media theory, I endeavour to provide an original analysis of the critical complexities of 5G technology and outline the persistent barriers to social inclusion posed by the present scheme of privatized infrastructural development.

For a literary-minded observer, it was hard to miss the quixotic undertones of the sporadic destruction of telecommunication infrastructure that followed in the wake of the Covid-19 pandemic. Quixotic, which the Oxford English Dictionary defines as “naively idealistic; unrealistic, impracticable; (also) unpredictable, capricious, whimsical,” is derived from the lengthy misadventures of the mad nobleman turned knight errant Don Quixote in Miguel de Cervantes' 17th-century novel *The Ingenious Gentleman Don Quixote of La Mancha*. Widely recognized as “the world's first and perhaps still its greatest novel” (Frye, 2010, p. 17), *Don Quixote* and its wayward protagonist have long functioned as a prism for the interpretive predilections of the reader's era. In the Romantic period, Quixote “join[ed] the gloomy and desperate band of idealists who maintain the purity of their egoism in the teeth of a scoffing society” (Frye, 2010, p. 15); in Francoist Spain, he lampooned the utopian imagination of “liberal reformers” of Cervantes' lifetime (Palmer, 2021), and in the early USSR, he “was chosen to become the symbol of the new Soviet man” (Gratchev, 2019, p. 131). While interpretations of Miguel de Cervantes' comic masterwork have evolved with time, Quixote's flexible, fanciful logic opens inroads to the uncertain events that occurred over the course of 2020, when mis- and disinformation linking the rollout of 5G technology to the novel coronavirus drove direct interfer-

ence with telecommunication infrastructure around the world. Efforts to report on these incidents and debunk their associated claims had the opposite effect, massively proliferating the perceived connection between 5G and Covid-19 (Bruns et al., 2021) and engendering lasting skepticism about 5G technology. Although the conspiratorial content detailing the connection between 5G and Covid-19 has faded to the fringes, 5G has failed to find the popular appeal of its forebears and emerged as a uniquely politicized discursive object. There are several reasons for this, including quotidian dissatisfaction with the quality of 5G networks and worsening trade relations between the United States and China, a major innovator in 5G technologies. However, the events of the pandemic folded 5G into a new infrastructural politics. Wireless technology is an ever more intimate part of everyday life (Greenspan, 2016) and privy to a long history of skepticism and health concerns (Bodner et al., 2020, pp. 166–169), but the rollout of 5G proceeded alongside an unprecedented animosity toward infrastructure. From the sporadic destruction of international telecom infrastructure associated with 5G in 2020 (Arkin, 2021; Cerulus, 2020; Fildes et al., 2020; Warren, 2020) to the ongoing sabotage of the US electrical grid (Bergengruen, 2023; Domonoske, 2023; Morehouse, 2022), isolated interference with critical infrastructure has emerged as a potent form of the “politics of disruption” (Atkinson & Dewitt, 2018). At present, there is little literature on the actors directly responsible for such interference, but the uptake of mis- and disinformation about 5G sheds light on the fault lines embedded in existing plans of infrastructural transition.

For the scope of this article, I focus on interference in Europe and North America, while acknowledging that hostility toward 5G is a transnational phenomenon with deep historical roots. Although I stop far short of legitimizing the content of mis- and disinformation that drove interference with infrastructure in 2020, my approach is ultimately reparative. The exploits of Don Quixote are factually misguided and often harmful, but his endeavours provide a conceptual apparatus to explore the broader social contradictions of his time. In much the same way, the chaotic efforts to disrupt the development of 5G infrastructure in 2020 demonstrate the conflicting imperatives of exclusion and inclusion underscoring an increasingly networked society. While the product of rigorous inter-governmental and industry efforts at technical standard setting, the popularization of 5G is left to the fiat of the market. As Easterling (2014, p. 202) points out, international standards like 5G are “instructive if only because they have, in a matter of decades, changed the way people across the world talk to each other while also strengthening a layer of influential intermediate authority operating in between the market and the state.” Though meant to expand the horizons of connectivity, 5G also acts as shorthand for a neoliberal paradigm of privatized development that excludes public participation and treats the novelty of a technical standard as

a commodity unto itself. Without greater attention to the critical nuances saturating mis- and disinformation about 5G, corrective interventions risk polarizing ongoing debates about the utility, applicability, and necessity of wireless technology into an intractable binary of utopian optimism and illicit conspiracism.

2. What Is 5G?

At its most basic, we may define 5G as a technical standard outlining the objectives for the fifth and latest generation of wireless cellular technologies, the G being short for generation. Established by 3rd Generation Partnership Project (3GPP), the international telecommunication body that developed the 3G standard, 5G shares the features of its technical forebears. 5G is wireless, like 1G, digital, like 2G, with data transmission enabling consistent access to the internet, like 3G, and subject to the market logic of a massive consumer base, like 4G. Through shared wireless infrastructure operating on the cellular grid system that supports existing mobile devices, 5G has the potential to vastly broaden the horizons of digital life. Typically, home internet access is provided through a combination of wireless and wired technology. Situated modems support local wireless networks on the electromagnetic spectrum via their connection to wired infrastructure such as telephone lines or fibre optic cables. Mobile devices use radio waves to access the internet over the electromagnetic spectrum, supported by signals organized and distributed by cell phone towers. The potential of 5G lies in the merger of these systems, as 5G supports higher frequencies of the electromagnetic spectrum and includes advancements in wireless encryption that allow the aggregation of different frequencies toward the same data transfer. There is already significant overlap between telecommunications and internet service providers, but 5G could render local WiFi networks obsolete by drastically expanding the capacities of cellular coverage to provide faster speeds, greater bandwidth, and lower latency. These changes mean that far more devices could be supported on the same network while also allowing for the optimization of wireless traffic through software-defined networking. This has significant implications for automation and the Internet of Things, as so-called “network slicing” can reallocate bandwidth to suit the needs of networked devices in real time. Thus, 5G poses a serious alternative to the existing topography of networked society by eroding the distinction between networked computing systems and the network itself (Oever, 2022, p. 5). It is under the weight of such great expectations that the conceptual saliency of 5G begins breaking down. According to one of 3GPP’s first statements concerning 5G, “5G will remain a marketing & industry term that companies will use as they see fit” (Flore & Bertenyi, 2015). Consistently couched in “revolutionary” language (IBM, n.d.; Kearney, n.d.; Qualcomm, n.d.), figured as a crucial part of the “fourth Industrial Revolution” (Mauro,

2019), 5G does not denote a discrete technology, but an unfixed signifier designating a panoply of technological aspirations. Their implementation outside the vocabulary of corporate branding remains to be seen as Oever (2022, p. 5) observes that “5G has not yet been standardized or implemented.” While there are many technologies associated with 5G and compliant with the existing specifications of standard setters, including new models of smartphones and “small cell” broadband installations, 5G itself is harder to disassociate from the phantasmal projections of telecommunications marketing. While 5G is a technical standard with a fixed meaning, it is also a technological commodity loosely applied to market faster wireless speeds.

While absent from existing approaches to mis- and disinformation centering 5G, the discursive complexity surrounding 5G holds significant interpretive weight to the disruptions of 2020. There is little recognition that most claims about 5G encountered in popular settings, especially early in its consumer rollout, may be inaccurate by strictly empirical standards, either by virtue of omission or speculation. An American advertisement from December 2020 gives one example:

5G from AT&T is fast, reliable, secure, and nationwide. So should you switch? Well, historically, those were the reasons new tech was adopted. Neanderthals saw that fire heated things fast, and made their caves secure from rampaging woolly mammoths. The ancient Romans saw that aqueducts were a reliable and fast way to transport water, so they stopped carrying water jugs on their backs and adopted them nationwide. And 1800s Victorians saw electricity light up rooms fast, and be more reliable than candles blowing out, so they stopped bumping into walls and made it nationwide. (transcribed by M. Peters; advertisement no longer included in the original streaming venue)

By the end of 2020, 5G was under no circumstances “fast, reliable, secure, and nationwide” in the United States. Despite being posited as a technical novelty that consumers may “switch” to, “5G” in the advertisement can only be reasonably conceived of as the current suite of services offered by AT&T with the ongoing *potential* for faster speeds. Such semantic slippage has been characteristic of the introduction of 5G into popular consciousness and telecommunications discourse. Well before the official rollout of 5G telecommunications, internet service providers advertised and installed so-called “5G WiFi” networks. Such networks have nothing to do with 5G telecommunications as such, instead referencing that the networks in question use a 5 gigahertz frequency. While broadly similar in terms of scaling up bandwidth, and now designated as “5GHz” by some providers, this ambiguity generated widespread confusion, potentially exploiting the ordinal associations of the G nominal system. While technologies broadly defined

as 5G might do a great many things in the future, in everyday life it is rarely clear to an inexpert audience what 5G refers to or what it does differently. The gap between such revolutionary potential and practical incoherence has significant consequences; 5G has produced persistent disappointment with shaky network coverage, slower speeds, and repeated accusations of industry overhype (Grijpink et al., 2019; Johnson, 2021; Marvin, 2019). Industry insiders have even gone so far as to suggest “that it might be time to move beyond the ‘Gs’ and towards more organic change, which is less likely to lead to disappointments” (Gross, 2022b). With 6G already in development, it is unlikely that such seismic shifts in telecommunication standards will occur anytime soon, but in order to get a better sense of the issues underlying the implementation of a new technical standard it is helpful to turn back to the early rollout of 5G. Unlike its predecessors, 5G entered a media landscape transformed by the failed promises of prior generations of information and communication technologies. Conspiracism and the persistent spread of viral mis- and disinformation have replaced the optimism and expanded accessibility that followed 3G and 4G.

3. 5G and Covid-19

Linkages between 5G and Covid-19 emerged early in 2020. Often centering the idea that Wuhan, where the novel coronavirus was first identified, was in the midst of implementing 5G infrastructure when the pandemic began, 5G–Covid-19 conspiracy theories paid little attention to the relatively embryonic stage of 5G’s development or the reality that 2019 saw the general introduction of 5G infrastructure in multiple countries (Reuters staff, 2020). These narratives traveled in the wake of the virus, erupting into the popular consciousness of the English-speaking world as the first Western lockdown measures were implemented in March. In their most spectacular form, the perceived connection between 5G and Covid-19 drove the sporadic destruction of cell towers, resulting in the disruption of wireless service to mobile devices. Across the political spectrum, a variety of actors appropriated or exploited mis- and disinformation about 5G to dangerous effect. In 2020, anti-5G activity was associated with anarchist groups, far-right nationalists, and Islamic extremists. At the time, US law enforcement internally referred to 5G conspiracy theories as “the greatest domestic threat to critical infrastructure” (Arkin, 2021). Isolated actors from Cyprus to Canada targeted cell phone towers, burning up to 77 separate sites in the UK alone (Fildes et al., 2020; Lamoureux, 2020). On Christmas day 2020, a suicide bomber in Nashville, Tennessee, briefly disrupted local wireless connectivity, including access to emergency services, after targeting an AT&T network hub. Initial reporting alleged a direct connection to the expansion of 5G networks in the area and anonymous sources involved in the investigation confirmed that “agents [were] investigating whether or

not [the bomber] had paranoia that 5G technology” was harming Americans (Finley, 2020). While Luddism might seem like an appealing historical analogue to this form of applied techno-skepticism, such a comparison risks overemphasizing the coherence of these actions. Instead of sustained, pragmatic workplace sabotage, attacks on perceived 5G infrastructure were as diffused as they were confused. Despite the fixation on infrastructure, there is little indication that these saboteurs accurately identified anything technologically novel in what they perceived to be 5G installations. These incidents demonstrate how the breakdown of 5G’s conceptual saliency described above took on a dangerous edge in 2020. Unlike other forms of mis- and disinformation, misleading information about 5G had significant potential for collateral damage. Responding authorities were then confronted with the challenge of reporting on these incidents without validating or spreading the rumours linking 5G to Covid-19, efforts which met with mixed success. Mainstream media coverage, in addition to governmental and intergovernmental bodies, issued myriad statements assuring the health and safety of 5G while attempting to debunk the “improbable,” “wild,” and “wildly untrue” (Cerulus, 2020; Fildes et al., 2020; Warren, 2020) connection to Covid-19. Yet such efforts immediately confronted the reality that greater media coverage also produced greater interest in 5G and the uptake of mis- and disinformation, prompting various policymakers, researchers, and social media platforms to advocate intervention and information quarantine as a response to the “infodemic” that accompanied Covid-19.

A variety of scholarly approaches were applied to the spread of 5G mis- and disinformation as the Covid-19 pandemic unfolded. Bodner et al. (2020) were among the first to publish on the subject and consider 5G in the historical context of techno-skepticism by tracing conspiratorial narratives along the lines of urban legends. This analysis is necessarily limited, if only by the text’s early publication date in December 2020. There is only a brief mention of the sabotage of telecommunications infrastructure, which is assessed as a participatory form of folk cultural “ostension involv[ing] the rash of cell tower arsons that followed the rise of anti-5G” (Bodner et al., 2020, p. 178). Though Bodner et al. are unique in this area for their complex consideration of the roots, propagation, and intersectional character of 5G mis- and disinformation, at the time of writing there was little sense of the disciplinary measures social media giants would take to control misleading information or the emergence of more conventional issues with 5G, such as industry overhype. 5G is positioned as necessarily innocuous and uncontroversial, if only because it does not cause Covid-19. These assumptions characterize subsequent research on the social element of 5G mis- and disinformation. One of the earliest and most widely cited scholarly articles by Ahmed et al. (2020) advocated for a policy of active intervention and information quarantine, although they find that the majority of

content on the subject “derived from nonconspiracy theory supporters” with roughly half of said content rejecting 5G mis- and disinformation outright. Despite these findings, the researchers justify their conclusions by identifying the absence of a clear authority figure “who was actively combating such misinformation.” The findings of Jolley and Paterson (2020) echo the conclusions of Ahmed et al. (2020), as their research “suggest[s] that belief in 5G Covid-19 conspiracy theories is associated with violent responses to the alleged link between 5G mobile technology and Covid-19” (Jolley & Paterson, 2020, p. 637). Bruns et al. (2020) provide a detailed analysis of “the trajectory of these stories from fringe circulation to significant impact over the course of little more than four months” on Facebook. They outline the textured and highly variable content of 5G–Covid-19 conspiracy theories, but their rigorous focus on the drivers of mis- and disinformation emphasizes Covid-19 to the neglect of a clear treatment of 5G. This analysis is further developed by Bruns et al. (2021). The authors assess the popularization of 5G–Covid-19 conspiracy theories through the “backfire effect” (Nyhan & Reifler, 2010) using multi-modal methods to map the spread of the conspiracy and theorize the role of social media and professional journalism in its uptake. Though equally rigorous, this article also neglects a fulsome analysis of anti-5G sentiment. The authors rely on a single piece of business journalism promoting 5G in light of emerging conspiracy theories to make the claim that connections drawn between 5G infrastructure and Covid-19 were made by actors with “ties to broader anti-technology, anti-vaccine, alternative health, religious fundamentalist, anti-Semitic, and far-right communities” (Bruns et al., 2021, p. 2). Though these connections are evident in some anti-5G conspiracy theories, this claim is somewhat selective, and its associations are not echoed by contemporaneous literature.

Meese et al. (2020, p. 40) offer a useful rejoinder, asking that researchers “look beyond conspiracy theories to a wider set of concerns.” The authors point to geopolitical competition over the market for 5G technologies between China and the United States as one such example. Sturm and Albrecht (2020) provide a productive lens with similar rationale. Although 5G mis- and disinformation is not the main focus of their article, they define it as an “improvised millennial narrative” that “presents three dominant improvisational strands...(1) Covid-19 is a government conspiracy to install 5G towers while we are in lockdown...(2) 5G spreads the virus...(3) the virus doesn’t exist, rather 5G creates Covid-19-like symptoms” (Sturm & Albrecht, 2020, p. 130). Sturm and Albrecht’s contribution illustrates the obstacles to analysis posed by a monolithic account of 5G conspiracy theorists as a coherent group. However, as in other literature assessing mis- and disinformation about 5G from this period, reflective analysis of 5G is absent, so it is helpful to put this work in dialogue with infrastructure scholarship directly concerned with 5G. In a position paper for the People’s 5G

Laboratory, Oever and Maxigas (2021) outline the necessity of a critical approach to 5G. The authors emphasize that “5G will not be implemented in isolation” and that “these technologies should also be part of a human rights impact assessment” (Oever & Maxigas, 2021, p. 10) to justify their approach. In a subsequent paper, Oever (2022) furthers this analysis, outlining the concept of “network ideology” in relation to 5G. Rendering a comprehensive treatment of the geopolitical tension represented by 5G, Oever examines the manufacture of Chinese 5G technology as a well-known security threat by showing that neither the “United States Department of Defense, NATO reports, nor any of the other countries that followed suit in the implementation of restrictive policies towards Huawei equipment, produced a *technical* reason for the exclusion of Huawei from their networks” (Oever, 2022, p. 7). Yet this analysis does not explore the dissonance between such a widely accepted form of anti-5G sentiment and more popular forms of discontent, as 5G mis- and disinformation is not considered broadly. The disjunction between these bodies of literature, one explicitly concerned with mis- and disinformation and one with 5G, is the motivating factor for this article. In the absence of a critical assessment of 5G itself, existing scholarship risks reproducing a concerning tendency in contemporary treatments of mis- and disinformation to use the uptake of factually inaccurate information to remove public agency and regurgitate the elitist rhetoric of mass society theories from the mid-20th century (Christensen, 2022). With few exceptions, the rigorous efforts of mis- and disinformation studies related to 5G to rebuke Covid-19 conspiracy theories failed to reflect on the apparent necessity of 5G or the possible perspectives of non-adopters, while taking cues from telecom industry talking points. This is perfectly understandable given the exigencies of the pandemic and the urgency of mis- and disinformation related to Covid-19, but this literature fails to examine the underlying diffusion of authority that allowed 5G to be so broadly appropriated. While this research accounts for what people believed about Covid-19 and 5G, a more holistic approach can proceed “by asking how people use these types of information” (Christensen, 2022, p. 637). Yet doing so requires a model of action that can operate in the gap between a fixed understanding of 5G as a technical standard and the more fluid associations of corporate marketing. Hence, I turn here to the famous incident of Don Quixote’s tilt with windmills described in the first part of Cervantes’ epic. Approaching the hostility to 5G through reference to Quixote’s joust, we may sidestep the question of whether saboteurs understood 5G in the strictest sense and hypothesize the broader functions of these actions and their accompanying narratives.

4. Tilting at Towers

Early in *Don Quixote*, during the titular knight errant’s second sally, the Don tells his squire Sancho Panza that the

procession of windmills before them is a troupe of giants that he must challenge in righteous combat. Despite the protestations of Panza, it is not until Cervantes' protagonist lies in a battered heap, tossed down by a spinning arm, that Quixote admits that a sorcerer has "turned these giants into windmills in order to deprive me of the glory of defeating them" (Cervantes, 2003, p. 59). In this emblematic scene, Quixote's actions are oversaturated with the ideals of chivalric romance, operating in opposition to the unromantic realities of early modern life. He constructs himself as the hero of a bygone era in sharp contrast to his surroundings and develops a flexible logic for his deeds that contain their own proofs against correction. The good-natured Panza tries to intervene in his master's fantasies, but Quixote is already prepared to counter this effort; he can absorb the reality that the giants are actually windmills, but only as it confirms his prior fantastic worldview. This is a recurrent feature of the novel, as the disjuncture between Quixote's valiant aspirations and the absence of any practical outlet for such action demands that he find creative solutions to understand himself and his society. While we may, as many others have, laugh at Quixote's folly, we may also empathize with the dissonance between social values and social reality. Moreover, from our historical vantage point we may also acknowledge that the knight errant's misguided actions offer some level of restitution to the inequalities of his time. Throughout his adventures, the provincial underclass of Spain is refigured by Quixote as lords and ladies, the impieties of the clergy envisioned as demonic sorceries, and the exploitative infrastructure of late feudal society suggestively mistaken for man-eating giants. Although the feudal period is typically treated as an epoch of sedentary agrarianism commanded by a shiftless military aristocracy, the changing dynamics of the era shed light on the discontent suggested by the actions and attitudes of Cervantes' hero. As Anderson (1974) points out, feudalism experienced concrete technical development with massive social ramifications. The introduction of powered mills, first with the watermill, "gave rise to one of the first and most long-lived of all seigneurial *banalités* of exploitative monopolies—the obligation of the local peasantry to take their grain to be ground in the lord's mill" (Anderson, 1974, p. 184). The root form of the term banal, *banalités*, not only obliged peasants to use the infrastructure of the feudal lord but also required that the peasant pay for the privilege. Such obligations propagated throughout feudal Europe and persisted well into the modern period. Though innocuous to the modern reader, Quixote's windmills embody both an ancient model of exploitation and a future that is utterly alien to his chivalric principles. Written at the inflection point between a fading model of feudal privilege and emerging modern industry, Quixote's joust captures the passage of one mode of production to another. Although much of the text is evocative of a properly medieval pastoralism well before Cervantes' time, the windmills of

Castilla-La Mancha are a real and distinctly modern feature, designed after Dutch innovations in the 16th century. Embodying the newly optimized expression of aristocratic domination that would persistently parasitize the emergence of capitalism, the claim that these windmills are a threat is politically suggestive. Looming over the countryside, consuming the fruits of peasant labour, coercing "repressive profit" (Anderson, 1974, p. 184) at the peasant's expense, these descriptions are equally appropriate to the feudal noble as they are the phantasmal giant. While a holistic account of the critical position of *Don Quixote* is far beyond the scope of this article and, indeed, a matter that has spilled centuries' worth of ink, the titular knight's tilt with windmills provides a potent parallel to the targeted destruction of cell phone towers in 2020.

Quixote's tilt at the windmills offers three critical insights that will be developed here and then deployed over the remainder of this article. First, the Don provides an archetypal expression of how excessive narrativization may appear as ignorance. He is not an empty vessel, but rather overly full of ideas about how his society operates and how he may positively conduct himself. Second, the ineffectual efforts of Panza demonstrate how such narrative saturation can subvert factual correction. Quixote needs more than a third party to authenticate that these windmills are really windmills, as this corrective gesture flattens the issue to a binary matter of facticity and fails to account for the possibility that he already knows he is factually wrong. He can accept that his giants are not really giants, because what matters is not that a sorcerer "turned these giants into windmills," but that this figure did so in order to "deprive [Quixote] of the glory of defeating them" (Cervantes, 2003, p. 59). The underlying reality that there is no correct avenue for Quixote's heroism is confirmed by Panza's attempted fact-check. Third, the joust outlines the symbolic role of infrastructure as a site of social confrontation. Infrastructure scholars have long held to the maxim that "the normally invisible quality of working infrastructure becomes visible when it breaks" (Star, 1999, p. 482), but this breakage may be more than physical. The contradiction between a vast body of romantic literature espousing the virtues of generosity and goodwill with the social reality of coercive architecture and aristocratic greed inscribes this infrastructure with significant symbolic weight. Even if this contradiction cannot be accurately or adequately described, its recognition dispels the invisibility this infrastructure would otherwise have. Considering these three features illuminated by the joust, we must then consider what precisely broke in 2020 to make infrastructure with a perceived connection to 5G hyper-visible, how this visibility was mediated by third parties, and whether efforts to disrupt the development of 5G were really a matter of ignorance. Existing attempts on the part of researchers, journalists, and policymakers to combat mis- and disinformation about 5G relied on the notion that its uptake indicated the absence of

factual information about 5G. There is suggestively little evidence that any interference with infrastructure in 2020 recognized a concrete technical difference in the systems targeted for destruction. Uncertainty about the difference made by 5G included journalists as well as consumers and would-be saboteurs, who frequently treated the destruction of cell towers as confirmation of the concrete technical development of 5G in local networks. Whether this had an impact on the efforts to disrupt supposed 5G infrastructure is only a matter of speculation, but it does highlight a concerning lack of fluency with such a ubiquitous technical term across a wide spectrum of thought. Though the technical specificity of 5G may have been broadly occluded, looking at the dynamics driving such disruptions through the lens of *Don Quixote* suggests that interference with cell towers was not the result of an absence of knowledge about this technical standard, but an overabundance of knowledge about what 5G represents.

Despite identifying the lack of an authority figure “actively combating [5G] misinformation” (Ahmed et al., 2020), studies of 5G mis- and disinformation linked to Covid-19 did not acknowledge that this absence was a condition of 5G’s existence. The freedom of association used to market 5G, also meant that there was little consensus among the general public about what 5G did differently at the start of the pandemic. Instead, consumers were saturated by a marketing blitz that constructed 5G as a technological commodity key to a faster, more mediated future without offering a realized use-case or perceptible application. As it “remain[s] a marketing & industry term that companies will use as they see fit” (Flore & Bertenyi, 2015), the status of 5G is little more than an empty signifier. Yet empty signifiers have political consequences and in its unstandardized form, 5G can only gesture at its own “structural impossibility in signification” (Laclau, 2015, p. 67) rather than a concrete benefit these technologies will provide. Optimistic assessments that “5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices” (Qualcomm, n.d.) also inadvertently illustrate a newly mediated normalcy emerging with the pandemic. Existing cell towers could thus be flexibly fitted into an imaginary that regurgitated the futuristic connotations of 5G but ascribed to them the difference made by Covid-19. By pairing Covid-19 and 5G, these narratives attempted to materialize the imperceptible, compounding multiple unseen events into the same plane of experience. An airborne pathogen is tethered to physical infrastructure and its symptoms are equated to the embodied perception of wireless signals. The appropriation of 5G infrastructure as a vector of Covid-19 gave saboteurs an individualistic, romantic alternative to the realities of responding to the pandemic. By providing a clear cause, these improvised narratives could sidestep the uncertainties of the early pandemic and fix action to concrete, if ludicrous, objectives. Tellingly, we can

also observe an effort to historicize the Covid-19 pandemic in narratives linking 5G to the novel coronavirus. One claim that circulated on Facebook in 2020, long since stripped from the platform, attempted to periodize 3G and 4G with the SARS outbreak of the early 00s and the swine flu pandemic of 2009–2010 (Reuters staff, 2020). Geopolitical disruption through transmissible worldwide illness is integrated into shifting technical standards, providing prior context and a conspiratorial explanation of a global phenomenon. Like Quixote, anti-5G saboteurs were immersed in a dark fantasy of unrealized virtue and value, caught between the utopian imaginary of corporate branding and the banalities of early pandemic governance. And like Quixote’s fantasies, these actions also contained proof against their correction. Regardless of their faculty with 5G technology or the unseemly connotations these actors attempted to draw between mass disease and international technologies, there is a basic connection being made between the conditions and consequences of globalized life that cannot be undone by a fact-check. The global interflow of people that produces the need for technical standards prioritizing transnational interoperability is also inextricably linked to the systems of movement that make a pandemic possible. In attempting to debunk mis- and disinformation about 5G, media and governmental organizations risked playing Panza to 5G’s errant Quixotes, elevating the perceived glory of the very interference they hoped to prevent. Panza may try to change Quixote’s giants back into windmills, but if Quixote’s imagined sorcerers have the same power, all this effort can do is confirm the virtue of Quixote’s struggle. Likewise, efforts to factually correct 5G mis- and disinformation in 2020 confirmed the apparent inevitability of 5G while failing to identify the diffusion of authority that made 5G so easily appropriated.

Laclau (2015, p. 72) argues that the condition of emptiness in signification “is the very condition of hegemony,” and it is difficult to contend that 5G’s emergent place in the ecosystem of telecommunication infrastructure and standardization is a sign of anything else. Surveying the terrain of technical standards and infrastructure, Oever (2022, p. 4) concludes “that there is little to no place for users or civil society in modern standards-setting if it is not in the direct interest of the industry stakeholders.” Thus, the surge in hostility towards 5G and perceived 5G infrastructure in response to an unrelated crisis parallels Berlant’s (2016, p. 394) late thesis that “links [the place of nonsovereignty in social life] to the postsovereign condition of the nation-state with respect to security and capital.” Yet 5G is hardly the only sign of globalization and far from the most visible, so it is crucial to consider not just the wider networks enabling hostility towards 5G, but their specific expression in interference with telecommunications infrastructure. We can further reassess the uptake of mis- and disinformation about 5G through infrastructure scholar Parks’ (2018, p. 3) analysis of *vertical mediations*,

or “audiovisual discourses that enact, materialize, or infer power relations as conditions or qualities of the vertical field.” In her terms, mediation means more than strictly representative content, it also encompasses the power relations embedded in the material apparatus of mediation. While Parks’ focus is the transformative mediations of vertical space that occurred in the wake of 9/11, the linkage of 5G and Covid-19 provides a potent parallel. Cell phone towers present the most visible aspect of the robust network infrastructure that sustains contemporary ways of life, the necessities of the radio spectrum dictating their imposing, skeletal design. Parks (2018, p. 7) entreats us to reconsider media coverage as an epistemological act, as the “practices of coverage...are aligned with particular epistemologies.” The concatenation of telecommunications infrastructure, made manifest in the rollout of 5G through the implementation of concentrated “small cell” broadcast arrays, heightens coverage in the conventional sense, but it also shifts the significance of what that coverage means. Interpolated in the cellular grid system and convergent with the underlying infrastructure that supports internet routing, 5G stands to fundamentally shift public perceptions of network technologies and further entrench concerns about privacy and surveillance. Telecommunications technologies have and will continue to transform the conditions of mediated life, especially in the aftermath of the pandemic, but they also concentrate power in the hands of service providers and embed telecommunication infrastructure as the only perceivable signs of a system of oversight that is increasingly remote and governed through irregular means. Cell phone towers are “situated sociotechnical systems that are designed and configured to support the distribution of audiovisual signal traffic” (Parks & Starosielski, 2015, p. 4), but they also signify the absence of agency in an increasingly networked society. Narratives linking Covid-19 to exposure to 5G, therefore, tied an affective sense of political enclosure to coverage by cellular infrastructure. The diffused sabotage of cell towers demonstrates that infrastructure is made a fulcrum for power relations, regardless of its necessity or perceived function. Attempts to disrupt perceived 5G infrastructure show that these sites retain profound significance even without a comprehensive understanding of what they do or how they work. Acting as a practical theater to contest consensus, legitimacy, and governmentality, “infrastructure is defined by the movement or patterning of social form” (Berlant, 2016, p. 393). As Quixote’s ride against the windmills resonates with the reality that, in the era his heroics harken back to, “*banalités* were deeply hated throughout the Middle Ages, and were always one of the first objects of popular uprisings” (Anderson, 1974, p. 184), we must consider the consequences of surrendering the infrastructures enabling participation in everyday life to the mandates of private entities. Just as the giants Quixote challenged still made possible his daily bread, the necessity of cellular network infrastructure also symbolizes

compounding exclusions from the material undergirding digital life.

5. Conclusions

Whether antipathy towards 5G will ever again reach the heights of 2020 or continue to simmer as latent consumer dissatisfaction is unclear, but the events of this tumultuous year throw into question the precepts guiding infrastructural transition. Left to the fiat of corporate marketing, the uncertainty surrounding 5G demonstrates the destabilizing influence of neoliberal plans for public-private development. If the popular uptake of the 5G standard is to deliver on the revolutionary promises of connectivity this generation of technologies aspires to, we must demand more than the existing scheme of industry hegemony and haphazard commodification. Though the nascent stage of 5G means real development is still over the horizon, it can no longer be assumed that the adoption of this generation of technologies will follow the paths of 3G and 4G. Considering the events of 2020 and their afterlives, we might disregard the disjointed content of resistance to 5G and instead approach the excess of incoherent concerns about 5G as a broader symptom of market-driven development that destabilizes the capacity to generate consensus. Embedded in an anticipatory imaginary that envisions non-adopters as “neanderthals” without offering any clear or consistent benefit to the lay user, 5G is popularly represented as a commodity whose sole substance is affiliation with the novelty of a new technical standard. An overabundance of forms of knowledge about 5G proliferates despite this fundamental vacuity, to be appropriated or improvised into any errant narrative. By offering an analysis of the proliferation of mis- and disinformation about 5G in 2020 through the lens of Don Quixote’s joust with windmills, this article has endeavored to use three critical insights to explore the limitations of the present scheme of infrastructural transition. First, Quixote shows how excess can appear as ignorance. Exposure to many competing representations of 5G may appear functionally indistinct from the absence of knowledge, but it is significantly harder to correct this position without acknowledging the mechanisms that have diffused authority in the first place. Second, this complexity is demonstrated by the position of Panza, whose intervention merely confirms that there is no correct avenue for Quixote’s heroism. Efforts to prove the safety of 5G were self-defeating to the point that they accepted the premise that non-adoption was not an option. And finally, the joust reminds us of the symbolic role of infrastructure as a site of social confrontation. Suspended between a violent suspicion from the fringes and a growing reactive impulse from the center, the material substance of shared life structures is increasingly the site of conflict. Without the ability to generate real consensus about what this infrastructure should look like, adequate response to interference will remain out of reach.

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Conflict of Interests

The author declares no conflict of interest.

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