NAVIGATING CHINESE-NESS: INFRASTRUCTURE, COMMUNITY AND THE MORE-THAN-HUMAN NATION

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DISSERTATION ABSTRACT

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The Chinese rail system is among the largest, densest, and most heavily used rail networks in the world, playing a central role in the circulation of migrant workers, students, professionals and tourists within China's domestic sphere. Research has examined the rail system's role in China's political economy and its use as a tool of statecraft, yet little research has been conducted on the rail system as a social space. How does rail travel contribute to the formation of community and place at the national scale? This dissertation argues that reconceptualizing the nation as a more-than-human assemblage illuminates how rail travel weaves together people, things and infrastructure to form a coherent but heterogeneous whole.

Drawing on more-than-human methodologies, fieldwork was conducted over seven months in 2016 and 2017. Spanning the geographic extent of the Chinese rail system, from its core to its far-flung peripheries, participant-observation gathered data on how the practices of rail skillfully assemble material things and spaces to produce a coherent system. Semi-structured interviews with passengers from a range of regional, generational, and socio-economic backgrounds gathered data on how the things and spaces of rail travel are perceived and how their use has evolved. This account of rail's

more-than-human dimensions informs the analysis of mainland Chinese discourses around the 2018 opening of the first high-speed rail (HSR) line to Hong Kong.

This project finds a system standardized over remarkable distances, characterized by a distinctively Chinese assemblage of infrastructures, objects and practices. This assemblage plays a vital role in knitting together China's diverse regions and communities into an integrated national territory and community. Practices reflect national conceptions of class, and ticketing interpolates national citizens. Yet it is also a system riven with fractures. A two-tiered system is emerging which mirrors, roughly, a divided ridership: poor migrants depend on the cheaper conventional services, while the better off tend towards the speed and comfort of HSR. In the Pearl River Delta, centralized national standards produce fractures at the regional scale. The more-than-human environment of Chinese rail re-inscribes and realizes underlying tensions and contradictions within Chinese nation-ness.

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CHAPTER I

INTRODUCTION

1. Research Problem and Context

On board high-speed trains between Beijing and Shanghai, Lanzhou and Urumqi, and countless other cities, a LED display at the front of the carriage relays to passengers the speed of the train, its number, the current time and the next stop. This information enables passengers to orient themselves, ensuring they have boarded the right train among the otherwise indistinguishable fleet and tracking their progress across the speed-blurred landscape outside their windows. The display also cycles through other messages: directing passengers toward electrical sockets, or warning passengers of the strict ban on smoking. Then, at the end of the loop, appears this slogan: "safe and top quality, build railways and strengthen the nation" (安全优质、兴路强国 *anquan youzhi, xinglu qiangguo*; see Figure 1.1). In just eight characters, this slogan captures the role that rail infrastructure plays in the PRC's nationalist self-narration. By providing safe transportation and top notch service, the rail system "realizes the Chinese dream of a great rejuvenation of the Chinese nation" (Liu Z. and Zeng 2014).[*]

These eight characters appear throughout the rail system; they are on billboards and big character banners on station platforms and in waiting rooms, as well as in

[*] This phrase brings together a number of core terms in China's nationalist discourse. The "Chinese nation" (中华民族 *Zhonghua minzu*) is a neologism from the early days of nationalist debate, coined to transcend the limitations of Han chauvinism and produce a broader conception of who can be Chinese (Leibold 2007; Mullaney 2011). "Rejuvenation" (复兴 *fuxing*) has taken on renewed prominence as the name for China's latest high-speed rail set. The "China Dream" (中国梦 *Zhongguo meng*) is a vague ideal which has been central to Xi's project of nationalist cultural governance (Callahan 2017).

carriages. Just as train numbers and stop names orient passengers within the rail network, these slogans orient the passengers and the network within discourses of China. The connection between rail infrastructure and nation-building was well-appreciated by early nationalists: Sun Yat-sen, the founding figure of Chinese nationalism, spent the first decades of the Republic of China planning an elaborate rail network to spur the economy and unite the Chinese polity (Edmonds 1987; Y. Sun 1922). It remains central to China's political economy as both a driver of development and a symbol of national progress. Yet the rail system is not necessarily a transparent medium for the exercise of state power. Safety was at the forefront of railway discourse in 2014 in part due to the disastrous and deadly 2011 Wenzhou train crash, a disaster that played a large part in the 2013 breakup of the powerful Ministry of Railways. The Wenzhou crash, moreover, became a flashpoint for popular grievances, sparking a wave of nationalist protest that was deeply critical of the state even as it took ownership of rail (Bondes and Schucher 2014). Rail is a mechanism through which the state shapes the national community, but it does not grant the state an authorial monopoly on what it means.

Figure 1.1. A nationalist slogan scrolls by on the LED display in high-speed rail carriages: the first half on a train between Chengdu and Chongqing, the second half on a train from Wuhan to Guangzhou. All photographs by author unless noted.

This dissertation locates the power of rail at a remove from the state: while the intent of the state in building rail and state discourses around rail cannot be dismissed, its impact is at a slant, mediated through the concrete specificities of rail infrastructure. In this dissertation I seek to supplement the sustained attention to the role of the state and to discourse within studies of Chinese nationalism with an examination of how more-than-human infrastructures articulate between state and nation, linking the two together and holding them apart.

This dissertation also locates the power of rail outside the realm of discourse. As neatly as the omnipresent eight character slogan captures rail's nation-building role, the slogan itself goes largely unnoticed: few of my respondents could recall having ever seen it, no matter how frequently they traveled by rail. As with rail travel, rail slogans tend to fade from conscious awareness, becoming part of the backdrop of everyday life. As noted by Billig (1995)'s turn to the banal, maps, stamps and license plates, shape perceptions of the nation far from the spectacle of marches and celebration. Moreover, scholars of nationalism have begun to examine how the nation takes shape in everyday practices (J. E. Fox and Miller-Idriss 2008; Skey and Antonsich 2017), from driving a car (Edensor 2002; 2004) to washing the dishes (Linde-Laursen 1993) make nation-ness manifest. Some have begun to explore how material things come to play a vital constitutive role within the nation, not merely as material bearers of social meaning but as productive of it (R. Jones and Merriman 2012; Merriman and Jones 2016; Verstraete 2002). In this dissertation, I synthesize studies of everyday nation-ness and work on the ontology of the more-than-human to show how a conception of a more-than-human nation can weave together investigations of practice, affect, and materiality within the national community.

A renewed attention to the things of the material world has percolated out from philosophy and science and technology studies (hereafter: STS) into the wider social sciences. The material turn situates social construction of meaning within an equally meaningful material world. Contrary to anthropocentric conceptions of agency, materialists examine the forces exerted by non-human things both natural and technological. The investigation of the assemblages formed by these human and non-human agents reveals them as heterogenous and contingent, coherent only insofar as they are constantly reproduced as such. Yet if nationalism studies and Chinese studies have paid little attention to materiality, materialist thinkers skillfully disassemble everything from microbes to global warming but all too often take the national unit for granted (exceptions include Jasanoff 2004; Jasanoff and Kim 2015).

Infrastructure serves as a point of contact for all these bodies of thinking. Infrastructure has drawn attention from philosophers, STS scholars, and geographers for its intransigent materiality—even as it subtends massive projects of state-making and nation-building, forming the invisible medium for social life, it never does precisely what it is intended to and no more (Star 1999; Kaika 2005). In contemporary China, rail infrastructure has become a ubiquitous element of everyday life, enabling the smooth flow of passengers in search of work, education, and leisure.

This dissertation investigates this flow, and the infrastructure of stations and carriages which it animates, as vital processes within the production of nation-ness. Passengers rely on skill to navigate their journey; these practices in turn depend upon the infrastructure of the rail system, forming a socio-technological assemblage. Rail is increasingly interwoven with other Chinese infrastructures from the national

identification cards which certify passengers' identities to the WeChat small apps they use to buy tickets, linking rail travel into a larger social assemblage. Rail travel is a central means through which people come to know China as a coherent territory and themselves as residents within it. Rail also lays bare China's fractures. Nation-building is far from a straightforward process of homogenization: it is a dynamic process, with new social divisions constantly emerging and old ones stubbornly lingering on. If rail is a site where nation-building takes place, it is also a site where fracture lines between regions, ethnicities and classes may manifest—or where they are produced. Social standards take on material form in rail infrastructure, giving rise to both integration and exclusion; social analysis must therefore also analyze the more-than-human environments which societies make for themselves.

My research is guided by these questions:

1. How has the state used the railway system to promote territorial integration through media discourse and in material reality?

2. How do the practices of passengers work with the more-than-human elements of rail infrastructure to produce space and community at the scale of the nation?

3. What social and spatial fractures are produced through and manifested in rail space? What disjunctures between nation and state are produced and manifested in rail space?

This dissertation is based on fieldwork conducted across China in 2016 and 2017, and discourse analysis conducted in 2019. As the nation-ness of rail is precisely what is under investigation, my research site is not any single line or station but "rail space" as a whole. Multi-sited ethnographies trade an intensive single-site focus for a topological

tracing of the object of study through the world system (Marcus 1995); my research borrows these methodological insights to follow flows of people and things as they circulate at the national scale. Drawing on affective, materialist and more-than-human methodologies (Dewsbury 2010; Nimmo 2011; N. J. Fox and Alldred 2015; Pitt 2015), I investigated practices of passengers and personnel and the design and use of station and carriage spaces. This research produced an ethnography of rail space as a more-than-human assemblage, highlighting how everyday practice builds national communities. The subsequent discourse analysis of media narratives concerning the opening of the new high-speed rail line into Hong Kong and the assembly of a Greater Bay Area generated an account of infrastructure's role articulating imaginaries of region and nation. The practices and things of rail space figured prominently: the ongoing infrastructural integration of Hong Kong residents into China's citizenship-based ticketing system and the debate around the joint checkpoint in West Kowloon bring together the practices of rail travel and the discourses of nation-building.

2. Theoretical Engagements

In conceptualizing this dissertation's object of research, I theorize the nation as a more-than-human thing. In doing so, I draw upon and contribute to the burgeoning literature on materialist ontology in science and technology studies (hereafter: STS), geography, and the wider social sciences. STS approaches have emphasized the constitutive role of matter in social reality, both as ligament of social order and as a source of chaotic excess. Since the nineties, an interdisciplinary body of scholarship has reconceptualized the state through an examination of how the materiality of non-human, technological infrastructure subtends the more visible elements of human social life. In

contrast, a sustained engagement with the more-than-human dimensions of the nation has only recently emerged.

This dissertation uses the term "nation-ness" to mark a distinction between the object of study in this dissertation and "nationalism." Nationalism, the normative political principle that nations ought to be the sole or primary unit of political life (Gellner 1983, 1), has been the more typical object of scholarly inquiry, a framework which has directed inquiry towards questions of discourse and social imaginaries. Rather than treating the nation as a solely social or discursive entity, I conceptualize it as a sociotechnical, material-discursive object composed of a multitude of human and non-human things. Accordingly, the conception of "nation-ness" employed in this dissertation is relational and materialist: I do not imply the existence of some sort of national essence. Nation-ness, rather, is a relation masquerading as a qualia: practices, people, and places are realized as national as they are knit into a nation. The rail system in China is not Chinese because it possesses a unique quality of Chinese-ness utterly unlike rail systems elsewhere, but because of the innumerable concrete relations which knit it into a particular assemblage of places, people and things collectively constituting the People's Republic of China. The nation is not a timeless ideal or discursive construct; rather it is nothing more or less that the people and things out of which it is constituted.

Centering infrastructure allows us to bridge a number of troublesome analytical, empirical and temporal divides in the study of China as well. The literature on the Chinese state and Chinese nation-ness has largely developed in isolation from the materialist approaches employed within this dissertation. While Chinese studies has encountered the same empirical issues concerning contradictory accounts of coherence

and fracture as the scholars of state and nation discussed below, there has been a relative dearth of theorization in Chinese studies. Bringing the insights from materialist theories sheds a critical light on the role of infrastructure in the Chinese state, conflicts between the local state and the center, and the imbrication of ethnic and national identity in China.

2.1. More-Than-Human Ontologies

In thinking through how rail infrastructure shapes Chinese nation-ness, I draw upon the broad theoretical re-engagement with materiality across the social sciences sometimes termed the material turn or new materialisms (Coole and Frost 2010a; Bennet and Joyce 2010; Kirsch 2013). This re-engagement with materiality has rippled out of philosophy (Deleuze and Guattari 1987; Bennett 2009) and science and technology studies (Latour 1987; 1999; Barad 2007) through the broader social sciences, re-orienting investigation towards matter's co-constitutive role in human endeavor. Within human geography, the effects of this re-engagement can be seen within cultural geography (Kirsch 2013; Whatmore 2006) and, more recently, within political geography (Barry 2013; Dittmer 2017; Meehan, Shaw, and Marston 2013; Müller 2015; Squire 2015).

Though diverse in their interests and commitments, these approaches share a general skepticism of classic positivist dichotomies between society and nature, society and technology, words and things. Most centrally, these approaches argue we have radically misunderstood what it means to exist. Drawing on Spinozan ontology (2002; Deleuze 1988), Deleuze and Guattari (1987) propose to rethink things as "assemblages": wholes which are only contingently and partially so. Assemblages differ from the common sensical conception of things firstly in that they are processual: their forms are stabilized through a constant happening rather than any intrinsic solidity. Secondly,

assemblages are heterogeneous: the actants out of which they are assembled have their own relations that are not defined by their function within the assemblage. Thinking things as assemblages, therefore, functions to avoid assuming stability and totality and instead examine the processes through which things are produced as contingently "co-functioning." As suggested by the term "actants," assemblage thinking decenters humans from questions of agency. Bennett (2009) argues for vitality of not just living things but all matter: every thing has the capacity to exert force on other things, often in ways that exceed any pre-existing conception of their character. Callon (1986) shows how social systems are shaped to their core by the actions of animal life, but the inorganic, from trash to the electricity grid, also compose society and retain the capacity to exceed and disrupt it (Bennett 2009).

This re-conceptualization is not simply a matter of matter, but of meaning as well. Materialist ontologies seek not to discard the critical tools of the cultural turn's discourse analysis but to re-situate them within a simultaneously discursive and material world (Haraway 1988; Coole and Frost 2010a). This requires applying the analysis of meaning to materiality, and re-evaluating of how discourse is itself material. Deleuze and Guattari speak of processes of coding, material forms which express and thereby stabilize the identity of an assemblage through genes or constitutions (1987; see DeLanda 2006, 14–19). Latour's actor-network theory examines the process by which facts emerge from scientific endeavor, arguing that they are not discovered so much as manufactured (1987; 1999; 2005). This is not, as Latour has spent decades attempting to make clear, an attempt to undermine the validity of science but rather an attempt to situate these discursive claims within the social and the natural, rather than fundamentally apart.

Latour argues that facts become more true the more they become entangled in networks of instruments, scientists, allies and publics (Latour 1999, 99). Similarly, technology becomes more efficacious the better it enlists the capacities of nature rather than by exerting greater control "over" it. Scallops (Callon 1986) and microbes (Latour 1999, Ch 4) are as central a part of politics and science as fisherman and microbiologists. These networks are not defined by a leap from things to words, from nature to science or from science to society but rather by their mutual "co-production" (Jasanoff 2004).

Barad (2007)'s theory of agential realism employs the concept of apparatus—simultaneously the experimental set up of physicists and Foucault's *dispositif*—to conceptualize how things emerge. Barad holds that agential realism is coterminous with quantum reality: equally applicable at every scale from the sub-atomic to the galactic, to social meaning as well as physical matter. If the assemblage foregrounds the transient and partial coming together of things, and an actor-network emphasizes the stability that emerges through co-production, Barad is concerned with the very moment of realization: the "cut" by which contingent possibility becomes determinate, a definite reality. Rather than locating boundaries at the edges of things, Barad argues that what seem to be relations of exclusion—ability and disability, light and darkness, the national and the foreigner—are distinctions *within* an emergent whole (2007, 158). Barad examines the reality of social categories without losing sight of their contingency, their existence always complicated by internal others and external selves.

Materialist thinking offers an alternative ontological framework for the re-examination of a set of prominent empirical debates within Chinese studies. Contradictory empirical findings concerning the balance of power between the central

state, local government and local communities in China (Shue 1990; Remick 2004; D. S. G. Goodman 2009; Shue and Thornton 2017) implicitly assume a zero-sum game between local and centralized power. Assemblage theory and actor-network theory introduce a framework in which it is possible that these social assemblages can "co-function" in ways that might empower—or undermine—both. Similarly, I argue the growing literature on the complex relations of interdependence between China's Han majority and minority nationalities (Gladney 1994; 2004), as well as on the hidden diversity within the Han (Mullaney 2012; Joniak-Lüthi 2015) stands to benefit from Barad's theorization of the co-production of self-other relations.

In this dissertation, I employ assemblage thinking to examine the relationship between rail infrastructure and the production of the Chinese national community. The Chinese rail system is assembled out of a vast assortment of things, from the engines that move its carriages to the tickets that identify its passengers—but none of these things are solely or wholly part of this assemblage. I argue that the rail assemblage, both its technological and social dimensions, plays a vital role in assembling the Chinese nation. It is unique in that no other assemblage plays precisely the same role, but not alone: assemblages of print and audiovisual media, of roads and cars, of classrooms and textbooks play similarly vital roles. While all these assemblages co-function within a national assemblage, materialist thinking remains keenly aware that this role is contingent and partial: as a Baradian apparatus rail also enacts cuts, realizing internal others within the national community to which it lends determinacy. The material role of rail and other infrastructures in the production of nation has only recently attracted scholarly attention; the role of infrastructure in another sort of assemblage—the state—has been the subject

of a richer literature. In China, the rail system has been an explicit part of the state assemblage. While it has played a central role in the rhetoric and practice of nation-building, it has been a locus for anti-state sentiment as well (Bondes and Schucher 2014; Chu 2014; Xia 2016). I turn to the literature on state and infrastructure to better understand how infrastructure functions as a potent but unpredictable element within larger social structures.

2.2. Infrastructure and the More-Than-Human State

The investigation of materiality, particularly infrastructure, has emerged across a wide range of disciplines as a productive lens for the analysis of the state. Within STS, this area has been examined by those interested in the role of the state in the development of science and technology (Shapin and Schaffer 1985; Jasanoff 1990; 2004; Hecht 2009; Jasanoff and Kim 2015; Rowland and Passoth 2015). In other disciplines, materiality has proven a productive site for the study of how the state generates such effects as a monopoly on legitimate violence through concrete mechanisms in particular spaces—and how it fails.

Building on a strand of scholarship skeptical of classical Weberian conceptions of the state as a unitary whole (Abrams 1988; Mitchell 1991), scholars of the state are excavating the material dimensions of the state assemblage (Bennet and Joyce 2010; Dittmer 2014; Joyce and Mukerji 2017). Joyce (2010) and Dittmer (2017) examine how the physical form and literal weight of the government documents contributed to and overbalanced the British state. For some (Joyce and Mukerji 2017; Painter 2006; 2010), a materialist perspective wholly destabilizes the concept of the state as anything more than a reification: while passports and post offices are real, no agglomeration of such things

ever adds up to the State. For others (Dittmer 2014; 2017), a materialist approach simply places the state on the same ontological ground as any other assemblage: contingent and partial, but no less real.

Infrastructure, particularly in the form of large-scale state projects, has proven a productive middle ground: large enough to have effects at the scale of the state, while concrete enough to offer material for analysis. Geographers, particularly those studying the political ecology of water, have looked to infrastructure to examine the social metabolism: how "nature" is taken up and consumed by society (Swyngedouw 2004). This literature shows mastering hydrology through dams, sanitation and hydroelectric projects was central to state-making during modernity (Kaika 2005; Swyngedouw 2007; 2014; Carse 2012; Meehan 2014). In anthropology, water, heating and transportation infrastructures have proven both a valuable site for examining the hidden dimensions of neoliberal politics (Collier 2011; Anand 2011; Harvey 2010; Dalakoglou and Harvey 2012) and as "concrete semiotic and aesthetic vehicles" (Larkin 2013, 329) of desire and fantasy (Mrázek 2002; Bear 2007).

Both of these literatures draw heavily on work on infrastructure from within STS. Hughes' (1983) examination of electrification spurred the study of the social construction of novel infrastructure systems (Bijker and Law 1992; van der Vleuten 2004; Bijker et al. 2012). The work of Susan Leigh has traveled especially far. Star's examination of infrastructure is attentive to the role of community and practice as well as material things. Star attends to the peculiar visual qualities of infrastructure: the more it is used, the less visible it becomes—until breakdown disrupts routines, and except for those users whom its design excludes. "For the person in a wheelchair, the stairs and doorjamb in front of a

building are not seamless subtenders of use, but barriers (Star 1990)" (Star 1999, 380). Central to Star's thinking is the "boundary object": things which articulate together distinct communities for whom those objects hold different meanings (Star and Griesemer 1989). Processes of standardization give rise to "boundary infrastructures," which simultaneously serve multiple communities of practice (Bowker and Star 1999).

Star's conception of infrastructure mediating between distinct communities without collapsing their distinctions helps makes sense of a broader literature within which large-scale infrastructure projects like dams, roads, and railways are alternately essential to state-making (Lefebvre 1991) and a deeply imperfect medium for state power (Scott 1998). Carroll (2012) draws on the concept of boundary object to examine how "water" sutured together the scientific establishment and government into a particular technoscientific state formation in California. Guldi (2012) argues that road-building was a key mechanism for the emergence of a strong central state. Harvey (2010; 2012) theorizes the role of concrete in realizing the state's presence in rural Peru far from the centers of power. Yet an equally crucial insight emerging out of infrastructural studies is infrastructure's capacity to undermine the state and subvert its intended impact. Scott's *Seeing Like a State* (1998) is a touchstone in this literature: his account of how a series of schemes intended to render people and territories legible to the state went wrong offers a powerful case for the limitations of state power. Others examine how infrastructure can be generative of alternative conceptions of state. Mukerji (2010a) shows how managing infrastructure projects instilled a series of royal French engineers with a conception of the state quite at odds with Louis XIV's. Goswami (2004) argues that the Indian railways built by the British to realize their imperial power were a key site for the production of

Indian anti-colonial nationalism. In the post-colonial context, Akhter (2015) argues that the Pakistani government's Tarbela Dam mega-project resulted in the fracture of state territory and an emerging regionalism.

This literature shows infrastructure to be a potent but unpredictable element within the state assemblage: it can be productive of considerable power over extensive territories, but imperfectly and unevenly. Moreover, infrastructure, particularly but not solely transport infrastructure, centers questions of state spatiality. Brenner and Elden (2009)'s critique of Lefebvre's state space theory emphasizes that while the production of a transparent, calculable space is the goal of state territorialization, it "is *not* homogeneous; it simply *has* homogeneity as its goal, its sense, its 'objective'... in itself it is multi-form" (Lefebvre 1991, 287). While Lefebvre spends little time on the specifics, it is clear that infrastructure—electricity, air traffic, railroads—is key (2009, 237–40). While infrastructure subtends the illusion of homogeneity which the state strives towards, the concrete specificities of that infrastructure shape fractures and hierarchies which disrupt that seeming homogeneity.

While I argue that theories like Mitchell's "state effect" (1999) and Joyce and Mukerji's "logistical state" (2017) go too far in dispensing with a concept of a real state, their approach to the state from the vantage of the practices and infrastructures from which they are assembled is a useful addition to Chinese studies' engagement with the state. Starting from the assumption that the state is heterogeneous and multi-sited makes sense of empirical case studies that alternatively find the local state subjugated by and autonomous from centralized power structures. The coordination of actors across scales into a coherent state is an empirical question, not a logical necessity. An infrastructural

approach further highlights tensions inherent in China's state-led development. As Lefebvre suggests, infrastructure may be a pillar of state legitimization discourse, but it constitutes a much messier reality on the ground (Chu 2014; Bach 2016; Oakes 2019).

These deep engagements with infrastructure as a state-maker and as a community builder offer a model for a parallel engagement with the question of nation-ness—how infrastructure brings together communities at the scale of the state. While the role of infrastructure in nation-building has begun to draw attention (Goswami 2004; Kezer 2009; Merriman and Jones 2016), nation-ness has largely remained a lacuna within investigations of the material. Much as infrastructures assemble and also challenge the coherence of the state, I investigate the rail system as realizing an overarching coherence within Chinese territory, but also realizing fractures. Old divisions are reproduced within rail space, and new ones are generated. Secondly, examining state and nation through an infrastructural lens suggests a new way of resolving the long-acknowledged tension within the nation-state form. While clearly not synonymous, neither can state and nation be easily disentangled. This dissertation suggests that infrastructural assemblages can play constitutive roles in both state and nation, parallel but distinct.

2.3. The More-Than-Human Nation

The question of how infrastructure is materially implicated in nation-ness is new. Until quite recently, nationalism has been the central object of study for both macro-historical accounts of the origins of nations as well as discursive analyses of nationalist sentiment. Yet the nation shapes and is shaped by routine practices of everyday life far removed from overt, self-conscious displays of nationalism. In the past decades, the study of "everyday nationhood" or "nation-ness" has developed the fine-grained investigation

of how contemporary nations are reproduced from the bottom-up, complementing accounts of nationalism's origins as an elite-driven project of the state (J. E. Fox and Miller-Idriss 2008; Surak 2012; Skey and Antonsich 2017). These everyday practices, however, are in turn entangled with the infrastructures of the built environment. While the study of nationalism has delved deeply into how states shape nationalism through language and performance, the ways in which material infrastructures contribute to the production of national communities and territories has not received equal attention. By investigating the ways that nation-ness subtends and relies upon infrastructure, this dissertation sheds light on how materiality and non-human agency also make essential contributions to the realization of the nation, arguing that the nation is more properly understood as a more-than-human thing. Centering infrastructure allows us to synthesize insights from a number of theories of nationalism: infrastructures make clear the connections between modern nation-building, nationalist discourses, and everyday life.

The academic study of nations and nationalism blossomed quite late. In Özkırımlı (2010)'s introduction to theories of nationalism, he argues that it was only in the wake of the Second World War that nationalism became a central problematic within social science. During the post-war period, theories of nationalism were divided by the question: *when* is the nation? "Primordialist" theories, holding that nationalism is a universal, or at least recurrent, feature of human history were forced to repeatedly moderate their position in the face of "modernist" critiques which argued that nations originated within the economic, political, and cultural transformations of the modern era (Özkırımlı 2010). For modernist thinkers like Ernest Gellner, the emergence of nationalism was a necessary albeit unintentional consequence of industrialization (1983).

Industrial labor requires a mobile and homogenized workforce, capable of moving quickly between tasks and industries. In order to facilitate cooperation and retraining, workers must be literate and conversant in a shared language and culture (Gellner 1983, 27–28). Managing the mass education infrastructure necessary to train an entire population in a common culture is a task too large for any entity but the state, which thereby comes to exercise a monopoly on legitimate education (Gellner 1983, 34).

This, Gellner stresses, is quite incidental to the state's intentions, and even to the intentions of nationalists: nationalism arises because it is a necessary and inevitable byproduct of modernity. Commenting on Karl Deutsch (1953)'s focus on the role of mass media in spreading nationalism, Gellner argued that "it matters precious little what has been fed into them: it is the media…which itself automatically engenders the core idea of nationalism" (1983, 127). Once a standardized national culture is established as the "minimal shared atmosphere, within which alone the members of the society can breathe and survive and produce" (1983, 38) under the control of the state, then the nationalist principle will emerge.

Gellner exemplifies a curious blind spot in modernist theories: while they lend great explanatory weight to modernity's grand societal transformations, their accounts are curiously disinterested in the specific technologies in question. Moreover, the transformations are seen as essentially binary: before work, education, media and mobility were artisanal, specialized, slow and limited, and now they are industrial, generic, rapid and wide-spread. The actual historical progress of these transformations—their stops and starts, uneven spatial development, and fractious politics—are abstracted away.

Benedict Anderson (1983) is a partial exception: he accords mass communication a key role in nationalism, but he attends more closely to how its nationalizing force emerged through the technologies through which it is transmitted. Anderson examines how "print-capitalism" creates a new population of voracious readers, united by an "extraordinary mass ceremony: the almost precisely simultaneous consumption ('imagining')" (1983, 35) of a mass-produced, vernacular print culture. Anderson's account exceeds Gellner's in two respects. First, and more influentially, Anderson's attention to the perceptual dimensions of the nation opens an avenue to examine nationalism not simply as an "objective" sociohistorical process but as a profoundly subjective experience of belonging and identity (Goswami 2002). Second, where Gellner posits language as a standardized medium allowing fluid exchange of ideas, Anderson is much more attentive to the material realities that condition such flows. Gellner speaks of mobility in the social sense; Anderson is concerned with how geographic mobility produces or undermines the hold of state territories on the imagination of residents. While he uses the word "imagined," Anderson's attention to the material context of *where* and *with what* communities are imagined is less an account of subjectivity than of Spinozan affect (Deleuze 1988).

Anderson traces how the relative friction of distance between the circulation of words and people shifts as the printing press is followed by technologies like steam power, radio and television (Anderson 1983, 34–35, 113–14, 135, 188). While mobility is accorded a considerable explanatory power within Anderson's typology of nationalisms, the technological infrastructures which enable this mobility are given perfunctory acknowledgement and scant analysis. Yet Anderson's engagement with the

infrastructural dimensions of print-capitalism is something of a high-water mark. Rather, it was Anderson's analysis of the subjective experience of the "imagined community" that took root among scholars of nationalism. By the late eighties, Anderson's work had come to signify a wide-spread shift from the investigation of the nation's "objective" origins to a focus on the nation's "subjective and discursive contours" (Goswami 2002, 773; cf. Eley and Suny 1996). Centering subjective experience revealed the nation to be a far less stable entity than it had appeared through the macro-historical lens: for scholars examining complex heterogeneities along lines of race, gender and class within national communities, the homogenous national unit was not an objective entity but a hegemonic fiction (Bhabha 1990; Chatterjee 1993; Hall 1997; Yuval-Davis 1997). For some, the nation has become "imaginary" to the point that it becomes solely a discursive representation, shorn of any corresponding reality (Brubaker 2004; Calhoun 1997; 2007).[†] If modernist's concern with origins neglects the on-going dynamics of national reproduction, then discursive approaches take hold of the other side of the same binary. By severing nationalist fictions from material conditions, subjective accounts cannot investigate how material conditions enable, hinder, or shape the reproduction of the nation.

In the past few decades, several strands of scholarship have attempted to situate subjective accounts of national experience alongside macro-historical accounts of nation-building at the state scale. One productive approach to the nation was inaugurated by Billig's *Banal Nationalism* (1995). The "banal nationalism" framework examines how

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[†] For a more in-depth critique of this conception of nations as "imagined," see Chapter VI.

national symbols, in the form of flags, coins and weather maps, circulate not as elements of "hot," emotionally-charged and rhetorically salient nationalism but as unremarkable features of everyday life (R. Jones and Merriman 2009). Banal nationalism drew scholarly attention to the existence of entire realms of national experience heretofore rarely examined. Moreover, by attending to ubiquitous representations of the nation, it refocused the study of national culture away from individual experience out towards the built environment. Banal nationalism's analysis of how national culture embedded within the landscape revealed a way to reconcile the homogeneity of macro-historical accounts and the heterogeneity of micro-analytical accounts: everyone moves through the same communal spaces but may interpret it in divergent ways.

Another strand of scholarship has coalesced around the how the nation takes shape in everyday life (J. E. Fox and Miller-Idriss 2008; Skey and Antonsich 2017; Edensor and Sumartojo 2018). Rather than taking for granted Gellner's "minimal shared atmosphere" of national culture, this scholarship examines how particular practices and routines shape a national habitus and national landscape in concert (Edensor 2002). Skey and Antonisch (2017) argue that "everyday nationhood" emphasizes bottom-up, agency-centered conceptions of nation-ness rather than top-down, state-centric conceptions, while Surak (2012) argues the micro-analytical investigation of nation-ness in everyday life refocuses scholarly attention on the contemporary rather than historical, the practices and embodiments rather than discourse and performance. Everyday nationhood expands banal nationalism's focus on representation to engage with the nation's affective dimensions, examining how particular contexts and environments generate feelings of belonging and alienation (Closs Stephens 2016; Militz and Schurr 2016; Militz 2017;

Sumartojo 2016; 2017). The notion of affect, in the Spinozan sense (2002), encompasses both the emotive force of nationalist discourse as well as the material force of corporeal embodiment (Militz 2017; Lapiņa 2018).

A small group of scholars draws on materialist thinking concerning the agency of non-human things (Bennett 2009; Coole and Frost 2010b) to examine how infrastructure contributes to nation-building (R. Jones and Merriman 2012; Merriman and Jones 2016). Arguing for a conception of nation and national territories as sociomaterial constructions, they explore the ways that infrastructures like road and bridges shape identity, culture and space at the national scale. Materiality enables roads and road signs alike to accomplish nation-building effects—and also enables objects to fracture the very communities they are intended to build (R. Jones and Merriman 2009; 2012).

A more-than-human approach to nation-ness that centers the role of infrastructure makes several interventions in the study of China. Introducing material, affective and more-than-human perspectives on the nation to Chinese studies answers Carlson (2009)'s call to examine the "mixed cauldron of identity-shaping influences within contemporary China" (2009, 29) outside the context of "hot" nationalism. Whether framed as a state construction or a populist uprising, the bulk of the literature concerning the contemporary Chinese national community analyses it as a discursive phenomenon (Gries 2004; Guo 2004; S. Zhao 2004; Z. Wang 2012; Callahan 2010; 2017). An infrastructural approach incorporates the considerable role of the state without reducing nation-ness to its role in narratives of state legitimacy and popular protest. The more-than-human nation complements and extends work on online Chinese nationalism (Leibold 2010; 2016;

Schneider 2018) and the emerging Chinese surveillance state (Leibold 2019) that takes seriously the role of technological structures in society.

Rail infrastructure in particular bridges the chronological and theoretical gap between early modern to contemporary Chinese nation-building. Geographical and economic analysis shows that between 1949 and 1978 was a period of substantial consolidation of China's transportation network (Comtois 1990; C.-K. Leung 1980). This construction also played a formative role in PRC state-making, illustrating both its continuities with Nationalist policies and its differences (Köll 2019; Meyskens 2015; Naughton 1988). Synthesizing the literature on early modern nation-building brings to bear a sensitivity to heterogeneity and contingency that is often lacking in analyses of contemporary nationalism; conversely it situates ongoing innovations like the advent of HSR as both a continuation and an intensification of historical nation-building processes. This dissertation argues for fully incorporating materiality and the non-human into our conception of the nation, in China and beyond.

3. Summary of Findings

This dissertation makes an empirical contribution to the understanding of the Chinese rail system as not just a state project of territorial integration, but as a constitutive more-than-human element of the contemporary Chinese national community. This dissertation examines how rail space reflects social and spatial fractures within China's body politic, but moreover how it is a site where such fractures are manifested and transformed. My fieldwork found that the rail system promotes territorial integration by propagating standardized practices and spaces across China's diverse regions. Rail space is substantially homogenized across the overwhelming majority of the Chinese rail

system: stations, carriages, and practices of rail personnel are more-or-less identical across most of China. This material transformation is marshalled within state propaganda to construct a discourse of party, nation, and territory as indivisible elements of a unified China. This discourse does not deny the distinctiveness of regions like the Pearl River Delta in Guangdong, but positions them neatly within the nation-state rather than apart from it or in opposition. Yet the national narrative does not itself neatly encompass regional discourses: apparently straightforward processes of national standardization and homogenization have a more complicated trajectory at the local scale. In the Pearl River Delta, the emergence of national infrastructural standards has causes fractures at the regional scale. Regional concerns about travel documents and online ticketing exist alongside national narratives, showing a continued disjuncture between national and regional imaginaries of rail.

Adopting a passenger-level perspective highlights the role of more-than-human elements of rail travel in shaping space and community. Rail space is assembled out of bodies and luggages, identification cards and smartphones, as much as from concrete and steel, and these material elements are continuously re-assembled through the skillful practices of passengers and personnel. The standardized infrastructure of the Chinese rail system allows those practiced in navigating it the ability to circulate freely through the network's considerable extent. Yet at the same time, that standardized environment has become a backdrop against which a novel set of social distinctions snap into focus. Even within a single carriage, distinct traveling practices make use of rail space in different and incompatible ways, realizing social distinctions through even how basic needs for sustenance are met. These distinctions have taken on concrete spatial form as high-speed

rail (HSR) and the cheaper conventional services have become starkly differentiated, segregating well-off urbanites and poor rural migrants. The conventional rail system, long synonymous with the floating population of migrant laborers who have driven China's economic transformation, is increasingly seen as a second-tier option, too dirty and loud for China's emerging middle class. HSR, on the other hand, borrows personnel training and affordances from air travel to cultivate a different, more comfortable milieu. Increasingly conventional trains and the HSR trains function as entirely separate networks, with different practices among passengers and personnel, offering different affordances within stations and carriages. The social disjuncture is manifest even in gross physical space: in many cities HSR trains and standard trains service different stations, and even stations which serve both have divided waiting areas.

This dissertation's more-than-human analysis of rail space produces an account that decenters the state: the state is only one actor among the many human and non-human agents who collectively produce rail space. The shape of the rail network owes a great deal to the Chinese state; it is nonetheless not wholly under its power and does not produce perfect homogeneity. While the rail system shortens travel times and accelerates circulations, it does so unevenly, deepening and redistributing inequalities of access across different regions and social groups. Decisions about where new lines and stations are opened and old ones are closed, who is able to travel freely and who finds themselves excluded, realize social and spatial inequalities at an immediate, visceral level. At the scale of the nation, new fractures have emerged between regions and cities, carving deeper contours into national space. The rail system is national in scale but not homogenous: its network topology connects cities and regions within a hierarchical

relationship where some are more connected than others. Rail's bias towards population centers in the heartland of China is intensified in the case of the HSR network. Not only are first- and second-tier cities like Shanghai or Shijiazhuang junctions of multiple HSR routes, they also receive more frequent service. Even near the heart of the network, third-tier stations in smaller cities are functionally isolated by the infrequency of stops. For wealthy urbanites shuttling between major cities, HSR allows for a seamless, uninterrupted flow: for those outside major cities, HSR service might run once a day or not at all. The presence or lack of HSR becomes a way that *suzhi* manifests at the urban level, marking a distinct line between the participants in China's development and those being left behind. This perspective illuminates the struggle of some cities in China over inclusion in HSR construction such as the city-wide protests in Linshui in 2015 (Allen-Ebrahimian 2015). Examining how patterns of social fracture propagate within what is an integrating and homogenizing infrastructure provides insight into how the growing force of the Chinese state can at times perversely generate new dissension among the peripheral and the marginalized.

4. Explanation of the Dissertation Structure

This dissertation combines elements of the monograph and article style dissertation formats: four initial chapters lay out the research as a whole, followed by four chapters intended to function as stand-alone journal articles. This dissertation utilizes the more-than-human nation to examine how the spaces of the Chinese rail network articulate together national communities, infrastructure, and the state. Chapter II reviews the literature on nation and state in China, contextualizes the development of the Chinese rail network within modern Chinese history, and describes the dissertation's research

methodology. The Chinese rail network has a long and fraught association with nation-building, and the geography of the country poses several challenges—and opportunities—for rail development. Chapter III goes into detail on the methodological challenges posed in applying ethnographic research techniques to a subject like the Chinese rail system. I also describe my approach to questions of positionality, and detail the process of data collection and analysis.

Chapter IV constitutes the empirical heart of the dissertation, giving a detailed account of the process of undertaking a rail journey in contemporary China. Adopting a passenger-eye view of the Chinese rail system, this chapter highlights how passenger practices, traveling accessories and the spaces of the rail system interlock to form the rail assemblage. I use Tim Ingold (2002; 2011)'s thinking on environment and skill to frame a holistic and textured account of rail travel from the moment when planning begins to after the journey is completed, with attention to how each step is realized through interactions with things like tickets, water bottles and luggage, and how each is shaped by and shapes perceptions of self and environment. I extend Ingold's analysis of skill to include a fifth step: the stage when the skill lies fallow, but nonetheless shapes how once-and-future passengers imagine their relation to space. This chapter shows how standardization of spaces and skills takes the particular experiences of specific journeys and transform them into a sense of unhindered mobility within a space of circulation—even while that mobility remains bounded by space, economics and class. This chapter provides a comprehensive overview of the nation-building dimensions of rail infrastructure in China; the following chapters delve into particular elements of rail.

Chapters V, VI, VII and VIII are written as stand-alone manuscripts. Having developed an analysis of the national scale in Chapter IV, Chapter V examines how mainland media discursively mobilizes rail infrastructure in a case where the regional scale offers a contrasting narrative. This article examines newspaper coverage of the new Express Railway Link (XRL) to Hong Kong to trace how the concrete specificities of ticketing and boundary control procedures are mobilized to produce national and regional scalar imaginaries. The XRL is a key infrastructural component in multiple distinct place-making projects. Regionally, it furthers the integration of Hong Kong within the Pearl River Delta, long the economic and financial heart of China. At the same time, the XRL connects Hong Kong directly into China's national high-speed railway grid for the first time—a change that thrusts old cross-boundary geopolitical tensions to the fore. Connecting Hong Kong to the regional inter-city network and the national grid has entailed a complex process of negotiation between Hong Kong, Guangdong, and Beijing states to develop not just technological inter-compatibility, but legal and administrative standardizations as well. These banal yet politically-charged changes to boundary control and ticketing systems illustrate how infrastructure is deployed to construct spatial imaginaries at different scales. State media positions these changes as discursively integrating Hong Kong into a cross-boundary Greater Bay Area and politically integrating the city into mainland China. Yet the process of centralizing rail imaginaries—and centralizing border control—has disrupted the strategic ambiguity between regional and national integration. This article contributes to the dissertation by highlighting the regional scale, exploring how nation-building processes intended to produce coherence at the national scale can also generate unanticipated fractures within

regions, examining state discourses of rail development, juxtaposing their narratives of national rejuvenation against the more complex emergent meanings of travel documents and border procedures. This article complements the dissertation's overall focus on the more-than-human by examining these dimensions of rail travel as they are deployed discursively. The XRL is interpreted both through state discourses of rail development, and through popular discourses emerging from everyday experiences of managing travel documents and navigating border procedures. Avoiding a naïve materialism that dismisses discourse, this chapter's analysis of matter within rail discourse rounds out the analysis of discourse within rail materiality in Chapters IV and VI.

Chapter VI focuses on theoretical issues concerning the scholarship on nation and state and the role of infrastructure. This article proposes a theoretical approach to nation and state that uses infrastructure to investigate their simultaneously coherent and fractured reality. In recent decades, research on nation and state has generated substantive evidence of their ambiguity, heterogeneity, and porosity. Contemporary theories characterize their appearance of homogeneity and integrity as just that: an appearance. Most precisely theorized as reifications, this tendency directs attention away from the real, albeit limited, ways in which nation and state transform social and spatial relations. This article proposes an alternative approach to the reality of nation and state that balances recognition of empirical findings of heterogeneity and porosity alongside a recognition of their material coherence. Boundary objects are a conceptual tool that emerged from investigations of relational ontology within science and technology studies. Boundary objects knit together diverse communities of practice within a shared infrastructural system, and offer a way of theorizing coherent entities that are nonetheless

shot through with discursive and material fractures. Hot water taps, a ubiquitous facility within the Chinese rail system, serve to illustrate how boundary objects participate in state-making and nation-building as well as articulating the relation between them. The case study illustrates how infrastructures capture not only the processes through which these entities cohere, but the fractured communities of practice which inhabit them. This article contributes to the dissertation as a whole by situating the dissertation research vis-à-vis the broad social science literature concerning nation and state and by presenting research findings concerning drinking water infrastructure and practices in contemporary China. Chapter VI is under revisions with *Environment and Planning C: Politics and Space*.

Chapter VII examines how distinctively Chinese conceptions of social difference are realized through the skilled practice of rail travel. Drawing on recent work in cultural geography and anthropology, I argue that the practices of rail travel are skillful and situated (Ingold 2002; 2011). In China, rail space is a site where an unusually broad cross-section of educational, class, and regional populations cross paths. It is consequently a site where the 'qualities' of those populations are put into direct and material conflict. Debates over social distinctions such as '*suzhi*/quality' and '*wenming*/civilization' loom large in Chinese discourses of individual and national development. Drawing on findings from fieldwork, I argue that practices of rail travel become laden with social distinction: how people navigate through and dwell within rail space, how they pass time, socialize, and even how they eat all mark different degrees of social class. Moreover, the social qualities of passengers become entangled with the built environment of rail space, which consequently takes on the social qualities of its

passengers. I use this analysis to formulate a new account of the advent of HSR in the mid-2000s: HSR successfully fended off the competition from air and car travel as much by transforming the social quality of rail travel as by increasing speed. This article contributes to the overall project of the dissertation by examining in depth the skills which link communities of practice with an infrastructural environment, fleshing out the relation between sociotechnological systems and national cultures—both their cohesion and their internal tensions. Skilled practice articulates people and the built environment; if the environment is standardized at the scale of national territory, then that is the place to which the people feel belonging (Edensor 2002; Ingold 2002). Chapter VII has been submitted to the journal *cultural geographies*.

Chapter VIII traces the flows of tickets and ID cards to investigate the constitution of the Chinese rail system as a *circulatory panopticon*: a Foucauldian "apparatus of security" which functions not through discipline but through harnessing the "natural" inclinations of the population to regulate itself. The introduction of the real name system has transformed the rail system from a site opaque to the state to one where the identity and movements of individual passengers are fully legible. Insofar as rail infrastructure has become a kind of panopticon, however, it is one quite unlike the classic Benthamite conception. Karen Barad's notion of "the apparatus" builds on Foucault's *dispositif* to conceptualize an ontological mechanism which, in making measurements, generates determinate realities. Read through a Baradian lens, Foucault's later work shows a similar interest in the emergent realities conceptualized and produced via the apparatuses of governance. This article proposes the "circulatory panopticon" model to advance two claims. First, Chinese rail infrastructure does not render people legible by

fixing them in place but rather, people become visible to the state apparatus through movement. Second, the centrality of mobility to the design of the circulatory panopticon indicates a wholly novel conception of population: not as a fixed collection of definite individuals to be disciplined, but as a “natural” phenomenon to be regulated through its inherent inclinations. Even as rail induces travelers to produce themselves as legible state subjects, however, their movements also realize unintended complications, diffracting clean lines between citizen and non-citizen. This cutting-together apart, in Barad’s terms, produces a citizenry which is heterogeneous from its first moment. Moreover, this same apparatus cuts together-apart space, producing complex diffractions of secured and unsecured spaces. Passengers must constantly produce themselves as legible subjects in order to enter and navigate through stations and carriages, and they do so through two things in particular: the ticket and the Chinese national ID card. In 2012, China Rail rolled out a new computerized ticketing system which allowed online purchase, but attached each ticket to a specific individual through their national identification card. Even as ticketing has become increasingly virtual, however, the materiality of the ticket remains central to the securitization of rail space. In 2014, a terror attack on the Kunming railway station triggered a new wave of securitization, cutting rail space apart from public space and greatly restricting flows. Both the ticket and the ID play a key role in this new regulation. A close reading of ticket and ID sheds light on how "more-than-human" things articulate together vast infrastructural assemblages like the Chinese rail system, juxtaposing the intimate scale of everyday life against the "macro" scales of nation and state. This article contributes to the dissertation by showing how state conceptions of citizenship are realized through the flows of material things through the rail system. This

article also contributes to this dissertation's theorization of materiality: Barad's realism offers an interesting counterpoint to the reconciliation of matter and discourse forwarded by the literature on affect. Chapter VIII is written for submission to *Political Geography*.

Chapter IX summarizes the dissertation, highlights key findings, and suggests some directions for continued scholarly engagement with the more-than-human nation in China and beyond.

CHAPTER II

THE CHINESE CONTEXT

1. Introduction

In the previous chapter, I introduced the central questions examined by this dissertation and, drawing on materialist theories of more-than-human state, developed my conception of the more-than-human nation. This chapter connects these theoretical concerns to the particular context of China. The specific path through which the state and nation have come together in China is unique as is the role that rail has played in these processes. An account of this process illustrates the arguments of this dissertation concerning the more-than-human, and provides necessary context to its contemporary development. This chapter situates the Chinese rail system not just within its historical and geographic context, but within its scholarly context as well.

Contrary to popular—and some academic—portrayals of China as a monolithic whole, Chinese studies scholars have identified a multitude of tensions within governance between central and local states and myriad, interlocking processes of ethnicization and nation-building in early modern and contemporary China. While written in isolation from the theories of more-than-human analyzed in the previous chapter, this body of work highlights similar questions of coherence and fracture within seemingly unitary social structures. In section two of this chapter, I review this literature in order to identify the points of contact between Chinese studies and more-than-human studies of state and nation.

This analytical review sets the stage for third section of this chapter, which situates rail infrastructure within the history of state-making and nation-building in

modern China. As noted by Köll (2019), rail provides a line of continuity through the dramatic turns of modern Chinese history. Rail contributed prominently to the fractured semi-colonial landscape of the late Qing, and loomed large in Chiang Kai-shek's nation-building Nanjing decade; it was central to Mao's Third Front and to Xi Jinping's China Dream. Tracing rail development thus sheds light on the shifting trajectories of national politics and the reshaping of economic and social geography.

In concluding, I show how this geographic and historical context sets the stage for the close examination of rail's contemporary state-making and nation-building dimensions, which constitutes the bulk of this dissertation. While rail infrastructure has to a large extent become a transparent medium for everyday life in China, its role is no less consequential simply because it fades from view. As rail infrastructure continues to evolve and expand through the introduction of new technologies and new requirements, the transparency of rail is constantly disrupted, forcing renegotiations of the practices of rail travel. Chinese rail infrastructure is thus both a text through which other dimensions of society can be read and also an actor in the production of that society.

2. State and Nation in Chinese Studies

2.1. The State

Narratives of China's rise often employ infrastructure as synecdoche for the triumph of the developmental state: whether the Three Gorges Dam, the high-speed rail network, or the Hong Kong-Macau Bridge, infrastructure has come to symbolize China for audiences at home and abroad (Bach 2016). As Oakes (2019) notes, however, the widespread recognition of the centrality of infrastructure to the contemporary Chinese state has not been accompanied by a sustained attention to the specificities of that

infrastructure. Infrastructure offers a rich text not only for inquiries like Bach (2016)'s analysis of how it fixes large-scale political economic contradictions, but also for the analysis of what Joe Painter terms "prosaic stateness", "the mundane practices through which something which we label 'the state' become present in everyday life" (2006, 753). A lacuna around infrastructure is unfortunate in the case of China because examined up close, Chinese infrastructure embodies the tension between apparent solidity and underlying fragmentation that has long been a dominant theme within studies of the Chinese state. In contrast to a still prevalent narrative of China as a monolith, some Chinese studies scholars have examined the interplay between powerful ministries (Strauss 1998; Köll 2019) and local states (Shue 1990; Remick 2004) at different periods in the history of modern China. This body of scholarship has grown dramatically since reform and opening, both because of increased access to data (Lieberthal 1992) and because of the highly visible policies of devolution put into place since 1978.

The coherence, or lack thereof, of the Chinese state has been interrogated with particular vigor within the scholarship of the local state. This body of work has examined the complex and constantly evolving balance of power between center and locality (Baum and Shevchenko 1999; Saich 2002; D. S. G. Goodman 2009; Q. Wang 2011). The "local" state covers quite a range in China, including every level of governance from the province down (Remick 2004, 5). While a number of scholars have examined the provincial state (D. Goodman 1997; Hendrischke and Feng 1999; Fitzgerald 2002), most work on the local state has focused on smaller scales: counties, townships and villages. Central-local tensions has proven an enduring framework across modern Chinese history. Remick (2004) intriguingly juxtaposes local states in two distinct regions before and after

the Maoist period, showing a striking degree of continuity at the local level. Shue (1990) shows that even at the height of Maoism, the rural peasantry exercised more autonomy in their relation to the central state than previously suspected, and argues prophetically that reform era decentralization may work to strengthen the state in the end. Studies of local state under reform and opening examined how newly empowered local states pursued a variety of development strategies (Montinola, Qian, and Weingast 1995; F. Wu 2002; Zhu 2004). Since the turn of the millennium, however, the central state's ability to discipline local states and regather devolved power has loomed larger (Chien and Gordon 2008; Y. Li and Wu 2012).

Geographers have contributed to the understanding of the state in China through a theoretical attention to questions of scale. Political geographers have long argued that scale is not a pre-given natural attribute, but itself an object of political struggle (Smith 1992; Jessop 2002; Marston, Jones, and Woodward 2005). The Pearl River Delta has provided an illustrative case study for examining the politics of scale, as struggles between China's richest and most powerful provincial states runs into some of the country's richest and most powerful municipalities as well as central ministries competing within Beijing (X. Jiang 2008; X. Jiang and Yeh 2013; Z. Li, Jiang, and Yeh 2014; Chung and Jiang 2016; X. Jiang 2017). Li and Wu (2012) show how rescaling is a core mechanism for the central state to undermine local states: by creating new regional initiatives, the central state can work around recalcitrant provincial governments.

Goodman (2009) argues that despite the many studies of the local state, what is meant by "the state" remains insufficiently conceptualized in Chinese studies. Baum and Shevchenko liken the problem to the parable of the blind men and the elephant: "analysts

probing different parts of China's reforming political anatomy often produce substantially dissimilar sketches of the body politic" (1999, 334). Local variation combines with constant change and a lack of conceptual vocabulary to render coherent analyses of the Chinese state difficult. In order to make sense of these cross-cutting processes of change, Shue and Thornton (2017) prioritize the analysis of repertoires of governing practices over the analysis of state institutions. Their conception of Chinese governance as always in the making, a braided river of governance constantly meandering as new obstacles emerge, follows Sigley (2006) in drawing on Foucauldian theories of governmentality and "technologies of the self" to understand how both officials and citizens are being shaped by contemporary governance in China. This approach bears more than a passing resemblance to the scholarship of the disaggregation of the state discussed in Chapter I (Abrams 1988; Mitchell 1999; Painter 2006; Joyce and Mukerji 2017). Yet Shue and Thornton appear to have conceived their approach in isolation.

Shue and Thornton's practice-centered conception of the state problematizes its unity, but their theory remains anthropocentric. Where materialist approaches to the state attend to how the concrete specificities of non-human things have been put to work by state-makers, as well as to how matter has undermined their efforts, Chinese studies approaches to the state have only rarely asked these sorts of questions (Rogaski 2004; Chu 2014; Oakes 2019). Rogaski (2004)'s examination of "hygienic modernity" comes closest to this dissertation's approach to rail infrastructure. Rogaski argues that with concepts like hygienic modernity, her gloss of the term *weisheng* (卫生), East Asian modernizers captured "what Foucault termed 'bio-power,' a series of techniques through which the state undertakes the administration of life, and 'governmentality,' the idea that

individuals internalize disciplinary regimes and thus harmonize their own behaviors with the goals of the state" (2004, 16).[*] Rogaski's work pushes beyond other analyses of Republican state-making by bringing into the analytical frame the social and technical infrastructures of water pipes and sanitary systems which made such transformations of subjectivity possible. Chu shows how the (dis)repair and (re)development of infrastructure in urban China connects the spectacular and the mundane, operating "not only to support state projects of legibility" but also the cultivation of "a certain tacit 'common sense' of the world" (2014, 353). Synthesizing Chu's infrastructure with Foucault's technologies of the self, I reconceptualize the process of state-making as equally social and technological, the production of an assemblage composed of words and things. Complementing the work of Remick and Shue, I use infrastructure to disaggregate the Chinese state along a novel dimension: not along ministerial or scalar lines, but by tracing the socio-technological processes through which a central state is assembled out of disparate parts. These parts contribute certain capacities to the emergent state, but bring along resistances and contradictions as well. Leibold's (2019) analysis of the "surveillant assemblage" emerging in Xinjiang conceptualizes it as a "weed" with roots embedded in various state organs at different scales. The concrete specificities of its socio-technological infrastructure shape both its sophistication and vulnerabilities and set it apart from the larger state assemblage.

[*] Lei (2009) examines alternative Republican-era conceptions of *weisheng* that, contra Rogaski, did not center on a European-derived modernity but promoted an equally novel but indigenous reading of "guarding life."

This dissertation's investigation of rail infrastructure takes seriously rail's power to realize the state in everyday life without assuming that infrastructure is in reality a transparent medium. Crucially, rail is not a microcosm of the Chinese state: rather, rail functions as a unique mechanism within a larger state assemblage. Rail's unique role is to centralize: to connect localities to a network within which each is both made interchangeable and fixed in a topological hierarchy of peripherality and centrality. This shows two ways in which the reality of the state comes to be common sense in local everyday life: on the one hand, this institutes the standards of rail infrastructure as a pervasive norm. On the other, topological relations turns the center into a standard against which local variations are cast in stark relief. The state is made real not through rendering every locality homogeneous, but by defining each in terms of its deviation from a centralized standard.

The ways in which rail infrastructure makes evident the limitations of and countervailing tendencies within large-scale state-making projects is particularly valuable in light of the resurgent central state. As Oakes writes, centralized infrastructure powerfully shapes the everyday lives of the people who come into contact with them, but is equally shaped by them in turn (2019, 67). While rail development has radically reworked the Chinese landscape according to Beijing's vision, it has also been a site where local states and popular communities exert claims and critiques of their own. Infrastructural approaches thus examine the power of the central Chinese state without becoming trapped by it.

As the historical development of Chinese rail discussed below demonstrates, it has long played a pivotal role in modern Chinese state-society relations. In the past two

decades, the advent of HSR has accompanied a dramatic reconsolidation within the Ministry of Railways (Tjia 2015); the subsequent fall of the powerful Minister of Railways has curtailed the once-autonomous ministry, moderating its autonomy vis a vis the central state. Rail development has also contributed to a concurrent effort to sculpt the Chinese population into a novel kind of national citizenry. Under Republican and socialist governance, the spaces of rail were understood as potent sites for such nation-building projects. As this dissertation shows, rail serves as a core component of contemporary nation-building as well.

2.2. The Nation

The Chinese studies scholarship on nationalism exhibits a discontinuity: a rich literature on the production of a Chinese national identity in the late nineteenth and early twentieth century comes to an end with the start of the People's Republic, and with a few key exceptions (Mullaney 2011; Köll 2019), does not pick up until reform and opening, or arguably even after the Tiananmen protests of 1989. The temporal divide is echoed by a conceptual divide: where the work on early modern Chinese nationalism is sensitive to the contingent and pluralistic nature of nation-building (i.e. Duara 1995), the literature on contemporary nationalism has tended towards simplistic typologies and a singular attention to overt state-led nationalism. A second discontinuity in Chinese studies of post-reform era nationalism is the analytic and disciplinary divide between studies of minority nationalities and Han ethnic relations and a prolific political science literature on the "rise" of Chinese nationalism. In more recent work, however, both of these distinctions are breaking down and a richer understanding of the multiple dimensions of Chinese national identity has begun to emerge. New calls to engage with a broader range of

nation-building processes beyond their manifestation in state campaigns or nationalist protest, coupled with a growing interest in the infrastructural underpinnings of the nation have begun to intersect.

2.2.1. Contingency and Plurality in Early Modern Chinese Nationalism

Duara's (1995) influential volume *Rescuing History from the Nation* was instrumental in reframing the study of nationalism away from teleology and towards a greater consideration of the contingency and multi-vocality of national formation. Duara investigates the different representations of the national community which were at the heart of elite and nationalist struggles to define the boundaries of the nascent Chinese population and territory. Duara argues that the nation, far from a cohesive subject of Hegelian History, always contains countless "others", both historical and in the process of emergence (1995, 55). Duara's framework is notable for encompassing both inter-ethnic struggles and the "sub-ethnic" others of regional and provincial mobilization, revealing tension and differentiation within the supposed monolith of Chinese society (1995, 69). Contrary to Gellner and Anderson, Duara finds that in China nationalism is not a novel form of consciousness but employs the same "cultural practices"—language, religion, political tradition—as identity formation in pre-national China. For Duara, "the relevant community is formed not primarily by the creation of new cultural forms—or even the invention of tradition—but by transforming the perception of the boundaries of the community" (1995, 66). While a useful corrective to theories of nationalism in which all that came before is consigned to the dustbin of history in favor of a homogenized whole, Duara's framework underemphasizes the degree to which nation-building does indeed involve the transformation of cultural practice at an essential level. Duara

highlights language; as scholars like Jing Tsu (2010; 2016) and Thomas Mullaney (2017; 2014) have shown, making written and spoken Chinese into a national language entailed a massive and ongoing transformation of the social and technological infrastructure of education, media and communications.

In the wider and more nebulous realm of "cultural practice", scholars have shown that Chinese nation-building entailed a mass restructuring of everyday life, both as a corollary of economic and societal change and as a self-conscious project of modernization. Harrison examines how a new national culture in the early Republican period manifested through "the clothes one wore, the calendar one used, the holidays one celebrated, even the day on which one took a bath" (2000a, 5). Morris (2004) argues that national physical culture constituted an intimate rejection of the portrayals of China as the Sick Man of Asia, as essential to modernizing the Chinese national body as queue-cutting. Chiang Kai-Shek's New Life Movement, which exhorted individuals to better themselves, is a particularly visible example of how the early modern state attempted to rework everyday life and personal comportment at the most intimate levels (Fukamachi 2010; Wennan Liu 2013). Köll's work on Chinese rail traces how these novel spaces functioned both as a laboratory for new performances of gender (2019, 159–60, 249–50) as well as a site for propagandizing state conceptions of civilized citizenry (2019, 187–90, 247–52) under the Republic and the PRC. Rail highlights the lacuna within Duara's account of nationalism: it is a novel environment, navigated via a novel set of practices. Yet Duara's insight into the ever-present poly-vocality of nations remains key: as this dissertation attempts to show, rail is as open to appropriation by divergent narratives of nation as any "traditional" cultural practice.

2.2.2. Nation and Ethnicity in Modern China

Other scholars have focused on the role of ethnicity. Harrison (2000a) notes the question of “what it means to be Chinese” has been divided awkwardly between the study of nationalism and the study of ethnicity; a growing scholarship examines not just how ethnicity plays an increasing role in national consciousness among China’s many minority nationalities and among the Han majority, but how ethnicity and nationality have constituted each other through China’s history.

For example, in Chinese studies, an extensive literature addresses the complex dynamic by which the Chinese state assembled and maintains hegemony over myriad minority ethnicities (Schein 2000; Bovingdon 2010; Harrell 2011). Leibold (2007) examines how Republicans and communists developed the concept of the multi-national state in order to discursively integrate the frontiers of the Qing empire (see also Duara 2011). Mullaney (2011) examines the politico-scientific enterprise by which the official 55 minority ethnicities were defined and bounded within the container of China. Han (2013) and Zang (2015) engage in cross-comparative contemporary studies of the multiple peripheral ethnicities to theorize why Tibetans and Uyghurs have exhibited more resistance to the central state than minority groups like the Mongols or Dai. Gladney’s (1991; 2004) studies of China’s Muslim groups suggest that the Uyghur and Hui define themselves both by and against the Han-dominated central state; he also shows how their increasing access to Chinese infrastructure like rail connects them to not just domestic circulations but transnational circulations as well. Yeh’s (2013) account of China’s development project in Tibet details how a narrative of an empty frontier was used to legitimize a process of internal colonization.

Studies of China's minority nationalities argue that, while officially integral parts of China's national community, in practice they constitute an internal other against which a fully Chinese self is defined (Gladney 1994; Schein 2000; Yeh 2013). Gladney (1994) furthermore argues that this internal dichotomy is used to impute to the Han majority a monolithic homogeneity it does not in fact possess. The Han ethnicity has drawn an increased level of scrutiny in recent years as it has come to play a larger role in official (Guo 2004) and populist narrations of Chinese-ness (Leibold 2010; Carrico 2017). The volume *Critical Han Studies* probes at the simplistic equation of "Han" and "Chinese" from a number of angles (Mullaney et al. 2012). Joniak-Lüthi (2015) argues that not only does Han-ness bear little resemblance to pre-national identity formation in China, it remains highly fluid between contexts today.

As the name Critical Han Studies suggests, the gap between Han-ness and Chinese-ness identified by this body of scholarship has been employed as a method to interrogate Han-ness. However, this dissertation inverts this to pursue a parallel inquiry: how can better delineating the contours of Han-ness help us better understand Chinese-ness? As Mullaney observes, the categories of both Non-Han and Han are peculiarly bounded to the historical geo-body of China (2012, 9). What can be said of the whole? Narratives of Sinification prevalent within accounts of Han-minority relations presuppose the pre-existence of a coherent, clearly delineated Han culture. Yet studies of Republican era nation-building suggest that the cultural practices of modern Chinese-ness were themselves a novel invention assembled out of, but much altered from earlier cultural practices. Chinese-ness, in the form of "Zhonghua minzu" (中华民族) was formulated in rejection of the "Bad" Han-ness of Han chauvinism (Bulag 2012). While contemporary

conceptions of Chinese modernity defined against the Four Olds are hard to come by, the Other of traditional culture is prevalent in the form of the backward, un-civilized, low *suzhi* peasant (Murphy 2004; Sigley 2009; Y. Lin 2011).

As Sigley (2009) shows, *suzhi* discourse is a continuation of a distinctly Chinese lineage of modernist thinking. *Suzhi* discourse parallels and in some cases overlaps with portrayals of minority nationalities as China's internal other (J. Wu 2012). As Chapter VII of this dissertation shows, the spaces of rail are a site where the politics of *suzhi* and everyday life come into sharp relief. The investigation of how cultural practices have developed alongside the development of rail infrastructure complements ongoing scholarly engagements with national and ethnic identity, illuminating how internal others are constituted between and within ethnic lines.

2.2.3. The "Rise" of Chinese Nationalism

Another strand of scholarship follows the "rise" of Chinese nationalism since reform and opening. The study of contemporary Chinese nationalism writ large has until recently assumed the party-state plays a hegemonic role in determining the contours of an essentially monolithic national community. As nationalism has loomed ever larger in Chinese politics and culture, scholars have widened the scope of study beyond the party-state and found nationalism emerging from a bewildering variety of places, generating an ever-growing array of nationalist typologies. A consensus is now emerging around an understanding of nation-building as multi-layered processes of continuity and change (Carlson et al. 2016; Duara 2018).

Inquiry into contemporary Chinese nationalism began in the early nineties with the question of why Chinese nationalism is weak or nonexistent. Pye argues China's

experience of colonialism set up an impermeable binary between the modernized, and therefore nationalized, port cities and a traditional, and therefore a-national interior (1993, 111–13). This dichotomy meant that the Maoist rejection of the coastal culture as corrupted—both capitalist and foreign—was also a rejection of modern nationalism. Consequently, Pye argues, China remains an "inchoate and incoherent" nation, really just "a civilization pretending to be a nation-state" (Pye 1993, 108, 130). Fitzgerald describes China as a "nationless state," a progression of state-dominated nation-building projects: "the state set out to create a nation after its own likeness and selected only those national attributes which happened to suit" (1995, 78).

One strand of scholarship focused on the sustained and deliberate education campaigns of the post-Tiananmen period as the primary form of Chinese nation-building. The Patriotic Education Campaign and its curriculum of National Humiliation, according to this strand of analysis, had produced a bespoke nationalism precisely suited to the purposes of the party-state (S. Zhao 2004; Callahan 2006; 2010; Z. Wang 2012). Yet for all its flair and dramatic emotion, patriotic education captures only one dynamic within China's national identity formation. The overt ideological work of the party-state has kept "hot" nationalism at the center of the analytical frame within Chinese studies, even as scholars of nationalism elsewhere have undertaken a radical reconceptualization of nationhood. Employed as an analytical frame, study of party propaganda perforce implies a unidirectional process of instilling certain notions of national identity, territory and history where the party-state plays the role of the teacher and the Chinese people play the role of passive students.

Gries (2004; 2005), observing the chaotic nationalist demonstrations of the late nineties, argues that a populist nationalism is rising against, or at least outside the control of, the state. The rise of a Han chauvinism antagonistic to the party-state Leibold (Leibold 2016; Carrico 2017) similarly implies a more complex and dynamic relation between state action and nationalist sentiment than a straightforward "nation-state by construction." Guo (2004) couches the struggle in terms of competing state, civic and cultural nationalisms. As Carlson notes, the proliferation of typologies of Chinese nationalism grew rather absurd: "A partial inventory includes the following: defensive, confident, face, pragmatic, anti-foreign, official, popular, assertive, Han, patriotic, nation-less, Confucian, democratic, avant-garde, transnational, and anti-imperialist" (2009, 24–25). As Guo readily concedes, these distinctions are analytic rather than practical: "In both theory and in practice, there is enough overlap between cultural nationalism and state nationalism to make a clear-cut distinction unfeasible" (Guo 2004, 18–19). This menagerie of nationalisms offers an oblique validation of Duara's argument that nationalism always contains a multitude; following Tsing (2005), I argue this indeterminacy is a big part of what gives the nation its political clout. Capable of being different things to different people, it thereby connects them.

Much of the scholarship on the rise of nationalism in China, has, implicitly or explicitly (Brittingham 2007), framed the question around its impact on China's international relations (Carlson 2009; Guang 2005; cf. Guo 2004, 11). Framing Chinese nationalism in terms of global politics emphasizes processes of exclusionary identity formation against an external Other. Events such as the 1999 Belgrade embassy bombing, the recurring Diaoyudao/Senkaku Islands dispute, and the 2008 Olympic Games have

played eye-catching roles in the development of "hot" Chinese nationalism (Downs and Saunders 1998; Deans 2000; Gries 2004; Callahan 2010). Even domestically, the establishment of holidays like National Humiliation Day has emphasized the external other (Callahan 2006; Z. Wang 2012).

Carlson (2009)'s critique of the scholarship of Chinese nationalism highlights its isolation from the larger literature on nationalism as a particular problem, leading to and a dearth of comparative referents and undertheorization of the influence of technological innovation on nation-building. A sense that China is a land apart is pervasive within Chinese studies (Pye 1993, 107; cf. Costa 2014's critique of Gries 2004; Duara 2018, 31). As Costa (2014) argues, while all nations are unique, China's case is not incomparable; a powerful state led nation-building in countries ranging from Japan to Italy. The tense conflation of Han ethnicity and Chinese national identity discussed above has considerable resonance with the tension between Englishness and Britishness discussed by scholars of nationalism in the United Kingdom (Colley 1992; Langlands 1999).

Carlson's observation of the dearth of engagement with the role of technological development, coupled with his call for greater engagement with the "mixed cauldron of identity-shaping influences within contemporary China" (2009, 29) resonates strongly with the aim of this dissertation. The connection between infrastructure and nationalism has been broached in discussions of the Chinese internet and cyber-nationalism. This literature analyses the Chinese internet as constituting a new sort of terrain on which state-society relationships play out (Xu Wu 2007; Leibold 2010; 2016; Schneider 2018). It is not simply a new iteration of an essentially identical medium, but a wholly novel space where different—more democratic or more volatile—possibilities exist. Leibold

examines how the architecture of internet infrastructure, alongside language, culture and regulation, plays a constitutive role in shaping the geography of Han cyber-nationalism (2016, 16–17). Schneider argues that political concepts like nation and state need to be rethought as technologies in their own right (2018, 6). This literature indicates the importance of attending to the medium of nationalism, as well as the content.

Analyzing the medium of nation-building usefully reframes our understanding of even seemingly straightforward state-led nationalism. The nation-building accomplished by, for example, the military training required of students in Chinese universities might perhaps have more to do with the shared experience it provides than its power to force a particular interpretation of that experience. Students may come out if it radicalized or alienated, pro- or anti-military, but regardless the experience becomes a shared point of reference for all who go through it. An infrastructural approach thus incorporates the wider range of nation-building processes, expanding the investigation of Chinese nation-ness in its banal and everyday manifestations.

Even in contemporary China, the reach of nationalizing forces such as education, media, is short of absolute. The sudden and dramatic advent of HSR has made the nation-building and state-making dimensions of rail infrastructure evident in a manner they have not been for many decades. While central in the early, fractured days of rail development, the ways in which rail infrastructure integrates national territory, unifies a national polity and instills state-approved senses of discipline in its passengers slip out of the analytical frame. Yet the impact of rail infrastructure—along with communications infrastructure in the form of smartphones and internet access—on the character of everyday life is greater today than ever before. Approaching Chinese nationalism through infrastructure offers a

perspective that complements and expands existing engagements with the production of Chinese-ness, narrowing the distance between Chinese studies and the broader study of nationalism.

3. Rail and the Assembly of Modern China

The role of the Chinese rail system in shaping nation-ness is inextricable from the physical and social landscape within which it operates. From the perspective of a nation-builder like Sun Yat-sen, this physical and social topography perfectly captures the challenge of building a comprehensive national rail network, but also the potential of such a network to transform the Chinese landscape at an essential level (Y. Sun 1922). However arduous the construction of rail lines into the interior, once built the rail network would smooth the stark differentials between the friction of distance in the east and west, creating a space of frictionless circulation within a newly integrated national territory.

In 1935, the Chinese geographer Hu Huanyong drew a line from Tengchong in the Southwest to Aihui in the Northeast (Figure 2.1). He noted that the south-east of this line had only a third of China's area but 96% percent of the population: in 2002, this population distribution was nearly unchanged (Naughton 2006, 18–19). This line approximates the course of the 380-millimeter isohyet across China, 380 millimeters of precipitation being roughly the amount of rainfall necessary to support agriculture. This line describes a central, though by no means the only, fault line within China's cultural and political geography.

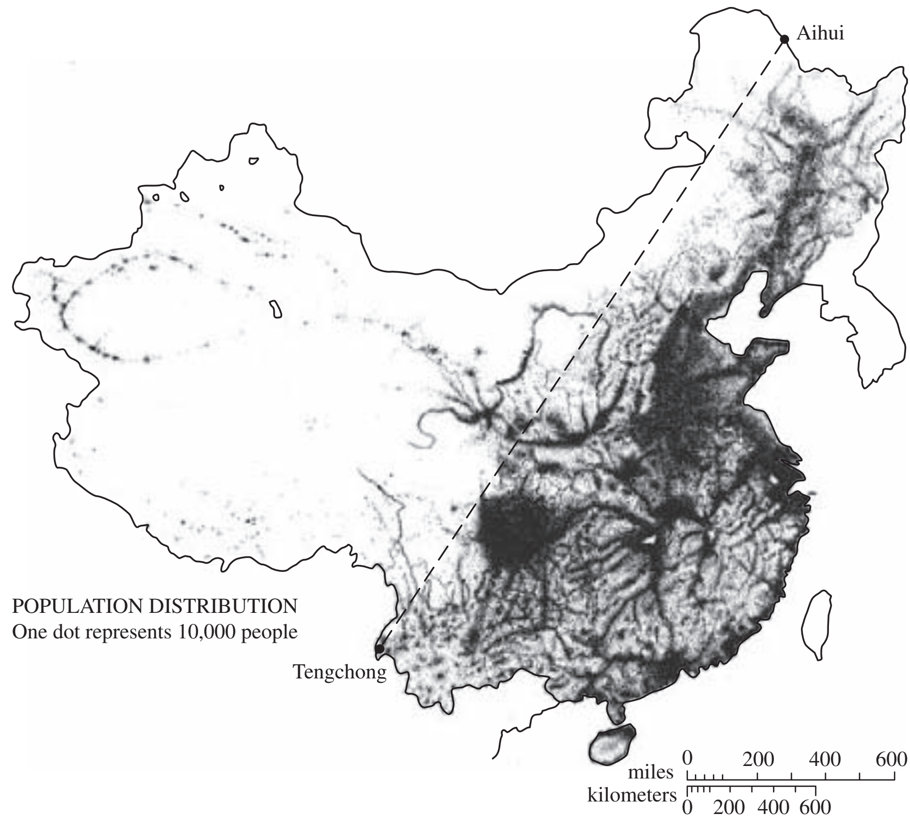

Figure 2.1. The Tengchong-Aihui line and the population distribution of China in 2002. Source: (Naughton 2006, 19)

The physical geography of China is highly varied. The topography of the northeast is low-lying and flat, while south of the Yangzi the terrain rugged, though relatively low altitude. To the west, altitudes climb dramatically towards the Tibetan plateau and the deserts and steppes of Central Asia, the terrain becoming a rugged series of mountains and valleys. China's cultural geography is marked by some of the same divides: the area around the densely populated North China Plain, north to Harbin and south to the Yangtze river, is densely settled by Mandarin-speaking Han people. Southern China is far more linguistically and ethnically diverse, significant populations of non-Han minorities; in the South even the Han majority has historically spoken multiple mutually

unintelligible regional dialects. To the west, the proportion of minority ethnicity, non-Mandarin speaking populations rises: Tibetan in Tibet, Uighur in Xinjiang, Mongolian in Inner Mongolia, and a diverse array of minority ethnicities in Yunnan and Guizhou. Today, traces of these underlying geographic characteristics are still evident from the railway carriage. Traveling over the North China Plain between Beijing and Shanghai, the track glides over nearly flat land for a thousand kilometers; between Chengdu, Sichuan and Chongqing, the train passes through an unbroken series of tunnels and bridges for hours.

Today, Sun's rail system has been realized, in broad outline if not concrete detail (cf. Edmonds 1987). Yet its impact has not been quite as homogenizing as early nation-builders might have hoped. Yes, the rail system has realized, in infrastructural form, the nationalization of language and cultural practices, and propagated state apparatuses of citizenship and population governance. Nonetheless, long-abiding differences between regions and communities endure and even intensify with the arrival of rail. Moreover, the spaces of the rail system give rise to wholly new fractures within the national community.

3.1. Railways at the End of the Qing

Rail entered China as a tool of colonialism. The Woosung Line in Shanghai, operated for less than a year in 1876, was built illegally by a British company. After it struck and killed a pedestrian, Chinese officials were able to negotiate to purchase the line, and disassembled it and shipped it to Taiwan to rust. Yet as Leung Chi-Keung notes, it would be wrong to interpret this as Chinese opposition to rail per se, but to foreign control (C.-K. Leung 1980, 22). Rail's advantages in matters of statecraft, particularly for military mobilization, were evident to Qing reformers. The priority for officials like Li

Hongzhang, who in 1976 was already working to establish an industrial base for domestic rail development, was to maintain control (C.-K. Leung 1980, 23). What hindered rail development in the late eighteen hundreds was a stalemate between the Qing, sovereign but drained of cash by a series of punishing wars, and the foreign powers, knowledgeable and wealthy, but shut out of Chinese territory.

Qing reformers sought to break the stalemate in their favor by developing industrial capacity and freeing up financial resources. Late Qing governmental reform accomplished these goals by devolving substantial responsibilities to the provincial level. The Taiping Rebellion marked a decisive shift, empowering local gentry and the provincial state to play an active role in militarization, a sphere of governance previously jealously guarded by the Qing state (Platt 2007; Rankin 1986; McCord 1993). The dire financial straits of the post-Taiping empire not only prevented the Qing from recentralizing the military but led to further devolution. Provinces were saddled with responsibility for modernizing reforms of education and industry (Platt 2007, 75–78) as well as for traditional state responsibilities for hydraulic infrastructure (Pomeranz 1993).

Ultimately, the stalemate tipped in the opposite direction: the Qing Empire's devastating defeat in the Sino-Japanese war of 1895 forced the Qing to compromise its sovereignty and grant territorial concessions to the colonial powers. A scramble for concessions quickly followed: between 1895 and 1911, British, French, German, Russian, and Japanese governments pressured a beleaguered Qing government to grant concessions of mining rights, treaty ports and of course, rights to fund, build and operate railways throughout the country (C.-K. Leung 1980, Appendix A). Of these, the concessions in Manchuria proved the most significant: Russian rail was seized by Japan

in 1905, laying the groundwork for Japan's railway empire (Young 1998; Elleman and Kotkin 2010). These concessions were pivotal in the development of Chinese nationalism: as a locus of nationalist sentiment, the concession redemption movements were uniquely capable of mobilizing local elites, provincial officials, merchants, students and even peasants around a common cause (Rankin 2002; Wei Liu 1999; Zheng 2009; Thompson 2011). Moreover, these movements structured nascent Chinese nationalism around the provincial scale, establishing a tension between province and nation that defined the politics of the early Republican era.

Contrary to the easy continuity suggested in phrases like "China has five thousand years of history," nationalism in China struggled from the first with an essential mismatch between the scope of the existing state and the scope of its potential nations (Ge 2018). At the end of the Qing dynasty, pioneering nationalists drew on a tradition of anti-Manchu sentiment to formulate a Han ethnonationalism (Platt 2007; Leibold 2007), a formulation that quickly absorbed newly introduced concepts of race (Dikötter 2015; Rhoads 2000). Yet as the basis for a Chinese nation, Han ethnonationalism suffered from two critical flaws. On one hand, it was too small: the Han majority dominated a relatively small area, and therefore a Han nation-state would lose vast stretches of resource-rich Qing territory (Anderson 1983, 35–34, 113–14, 135, 188)(Fitzgerald 1995; Leibold 2007). On the other hand, it was too large: despite a nucleus of shared cultural identity dating back centuries, the diverse peoples identified as Han had neither a shared language nor any tradition of political solidarity (Mullaney et al. 2012; Joniak-Lüthi 2015). Rather than along national or racial lines, common identity was historically understood along the

lines of lineage, county, or native place (Cole 1986; Schoppa 1992; Rankin 1986; Duara 1995; B. Goodman 1995a; Cole 1996; Belsky 2005; Platt 2007).

Both nation and province were novel constructions, and in the decades before the fall of the Qing, it was by no means self-evident which was a superior scale for the formation of a modern nation-state. In the apparent absence of a national state, a number of local elites and populist reformers latched onto the province as the most suitable site for politics (Duara 1995; Platt 2007; Rankin 1986; Schoppa 1977). Liu Wei (1999) argues that three factors are crucial to the rise of provincial consciousness in the first decades of the 1900s: the devolution of state functions to provincial governors, the administration of mining and rail concessions at the provincial level, and the widespread perception of the Qing as unwilling or unable to defend its sovereignty. Schoppa (1977) and Rankin (1986) highlight the rescaling of elite power: not only down from the imperial court as the exam system ended, but up from the county or prefecture. Platt (2007) shows how a regional solidarity lingering from Taiping-era military mobilizations and traditions of anti-Manchu revanchism formed the building blocks of Hunan's fervent provincialist movement.

The provincialization of state functions meant that nation-building processes like vernacularization (Tsu 2010) and printing (Judge 1997; Harrison 2000b; Reed 2011) took place simultaneously at national and provincial scales. Rail and mining concessions, however, were administered at the provincial level and concession redemption movements took on the same spatial form. In the first decade of the twentieth century, a substantial part of popular politics was organized around raising funds and lobbying provincial governments to reclaim the lost mining and railway concessions (E. Lee 1977).

Concessions proved to be unusually capable of unifying officials, agitators, merchants and gentry across such diverse provinces as Sichuan (D. Li 2004; Zheng 2009; Rankin 2002), Shanxi (Thompson 2011), and Zhejiang (Chi 1973; Rankin 2002). Provincial railway companies emerged under the leadership of merchants, officials, or gentry, with widely varying degrees of success (Jin 1977). Despite their general popularity, due to lack of technical knowledge and corrupt or speculative finances, very few domestically funded lines ever became going concerns. In Sichuan, for example, the government-back provincial company raised significant sums yet by 1911 had completed only 30 kilometers of track (C.-K. Leung 1980, 38–39). In Guangdong, in contrast the Canton-Hankou line was redeemed from an American company in 1905, opening an initial and profitable section to Shaoguan in 1915 (Jin 1977, 93; Tsin 2002).

By 1911, some twenty-six provincial companies had built a total of about 650 kilometers of private and provincial-owned lines, out of a national total of roughly 9,000 kilometers; foreign companies directly owned another 3,760 kilometers of line and held the loans for vast majority of the rest (C.-K. Leung 1980, 36–38, 47). The inconclusive contest between Qing, provinces and colonial powers was reflected in the geography of the rail network itself: railways connected Beijing to its immediate periphery; a scattered handful of provincial lines were operating around Shanghai and Guangzhou; colonial lines reached into Yunnan from Indochina and into the Northeast from Russia and Japanese-controlled Korea. The geography of rail realized, in material form, the fractured political landscape of semi-colonial China.

3.2. Rail Under the Republic

In 1911, the Qing court announced their intention to recentralize domestic rail administration under imperial control. From the perspective of the provincial right recovery movements, this was an attempt to seize control as illegitimate as the initial concessions. The wide-spread backlash turned ongoing activism for recovering railway rights concessions into outright revolt. In Sichuan the unrest was particularly wide-spread, and turning to outright violence by summer (Rankin 2002, 348; Zheng 2009). Troops stationed in Wuchang march to aid the Sichuanese governor suppress the insurrection; on October 10 Republican revolutionaries in Wuchang launched an uprising which led ultimately to the fall of the Qing.

By the mid-1920s, a consensus about the contours of modern "Chinese-ness" was emerging. First, it would be defined not by language, ethnicity or any other social characteristic, but solely by the contours of the state. In place of a Han-based national community, Liang Qichao's "Zhonghua minzu" (中华民族) was adopted by Sun Yat-sen as the basis for a unifying pan-ethnic nationalism, and became the default national community within Nationalist and Communist rhetoric. This is not to say there was no variation: Chiang Kai-shek's Nationalists advocated assimilation of non-Han peoples, and the Communists advocated a multi-ethnic national identity (Leibold 2007 Ch 2 & 3). Second, argument over the balance of autonomy between province and nation was brought to a conclusive end by the "betrayal" of Sun Yat-sen by Cantonese warlord Chen Jiongming in 1922. Both Nationalists and Communists alike understood Chen's split as a betrayal of Chinese nationalism in the name of regional separatism (Duara 1995, 193–204). This nucleus of agreement on the spatial and demographic contours of the China

they sought to realize defined the future nation-state as contiguous with the Qing, governed from the center.

For Sun Yat-sen, rail played a central role in realizing this imaginary. Forced from the presidency and appointed national railway planner, Sun instead spent the 1910s assembling an elaborate five-part development plan for China, largely via the construction of railways (Edmonds 1987, 424; Y. Sun 1922). Sun argued this rail network, along with new ports, roads, and industrial works, would unify the Chinese national community, integrate Chinese national territory and spur its industrial development in one stroke. Sun's explication of "railway economic law" held that reducing the friction of distance between the resource-rich interior and the population-rich "China Proper" would realize profit far beyond its expense: not least, as Part III of his plan made explicit, by driving the colonization of the former Qing frontier (Y. Sun 1922).

While Sun's vision of modernizing infrastructure and internal colonialism was certainly in line with Nationalist imaginaries of a modernized China, Sun's proposal was beyond its capacity to realize (C.-K. Leung 1980, 88). Constant strife inside the Republican government and beyond, between competing cliques and regionally-based warlords diverted government resources from rail development at best; at worst it led to the appropriation and destruction of railway materiel (Köll 2019, 69–71; C.-K. Leung 1980, 81). The question of rail was less salient in the early Republic than in the last decade of the Qing. The newly established Republican state implemented with little objection the same centralization of rail administration that ended the Qing, although in practice the rise of warlordism stymied substantive centralization through the 1930s. In

the place of a cohering national network, the Republican period saw a deepening and reorganization of divisions between national, provincial, and colonial networks. Even as control of rail was core to the regionalizing strategies of warlords like Yan Xishan, however, its symbolic function as a marker of the modern Chinese nation-state grew. Rail stations were a site where discourses of nation-building were promulgated and the behaviors of modern civilization were put into practice.

From the vantage of Beiping or Nanjing, the period between 1911 and 1937 was an arduous but steady movement towards centralization and standardization under Republican control (Köll 2019). Privately-owned Chinese lines and foreign owned lines were being integrated into a single railway administration: the Ministry of Post and Communications, or after 1928, the Ministry of Railways, oversaw the development of standard practices of accounting, management, education within rail administration (Köll 2019), as well as enduring work regimes (Morgan 2001). This period of institution-building was pivotal for the long-term development of the system: the railway bureau, the basic unit of railway administration, formed during this time and endures to this day (Köll 2019, 59).

In Shanxi, military governor Yan Xishan built his own provincial rail network at a deliberately different gauge than that of the rest of China; it was only converted to standard gauge by the invading Japanese (D. S. G. Goodman 1999, 219; Jing 1993). Meanwhile, in the Northeast, the South Manchuria Railway was the centerpiece for Japan's wide-ranging colonial ambitions (Young 1998), reshaping industry and agriculture, education and culture in the form of an emerging global empire (Duara 2003; Gottschang 1987; McDonald 2015; Rodgers 1948). To counter Japanese influence, the

Nationalist government expanded lines from Tianjin to the northeast, a project that came to naught when Japanese forces invaded Manchuria in 1931. As a result, by 1937 Japanese-controlled track in Manchuria constituted over 40% of total track length in all of China (Jiaoe Wang et al. 2009, 768). In a strange paradox, between 1911 and 1937, the Chinese rail network became more centralized under the Nationalist government, developed more isolated provincial networks under the warlords, and took on a more pronounced colonial character under the Japanese.

Despite its incoherent and contradictory development, railways nonetheless had significant impacts on economic and social life in pre-war China. Railways both served as a conduit for the transmission of new practices, consumer goods, and market relations into the regions alongside the tracks, and constituted a novel social environment which demanded the development of, for example, new gender relations. Early modern Chinese rail had a profound impact on the economic geography of central China (Jiang and Xiong 2005; Zhancai Li 1996a; H. Liu 2008; Pomeranz 1993). Pomeranz describes the disintegration of the once vibrant Huang-Yun region, on the Grand Canal between Beijing and the Yangzi, into a disparate collection of peripheries to new economic cores defined by railways (1993, 5, 147). In contrast, cities like Zhengzhou were revitalized, and cities like Shijiazhuang were built from scratch by their location at the intersection of two rail lines (Jiang and Xiong 2005; H. Liu 2008). Beyond economics, proximity to rail affected the transformation of social life as well: stations spread new conceptions of time discipline, gender interactions, and personal comportment. Not far, however: even counties adjacent to counties with a railway station saw far fewer changes to clothes and gender relations than the county the line passed through (Zhancai Li 1996b, 57).

Railway stations and carriages were wholly novel, and required a multi-level educational effort. Railways printed guidebooks which both introduced the stops to passengers and also taught them how to visualize the topology of rail space (Köll 2019, Ch 4; cf. Schivelbusch 1986; Löfgren 2008). Station architecture gave pride of place to large clocks, enabling if not enforcing a stricter degree of time discipline. Carriages, segregated by ticket class rather than gender, they forced a renegotiation of behavioral norms: these too took the form of guidebooks and railway rules (Köll 2019, 147; J. Zhang 2010). The pedagogical effort extended to the actual classroom as well. Textbooks for primary students taught children to read clocks and how to queue in front of ticket windows, and encouraged them to "play train" (*zuo huoche*) (Köll 2019, 147, 159). The purpose of this education was not simply about properly socializing future train passengers but teaching them to become better-disciplined citizens, linked through the practice of train travel into a larger political nation-building project (Köll 2019, 158–61). During the Nanjing decade, the New Life Movement attempted to rework the daily habits and practices of individuals with remarkable specificity; along with instructions on how to eat, how to dress, how to sleep and how to move, New Life publications also instructed Republican citizens on how to queue (Fukamachi 2010).

Political intent aside, how did the actual experience of rail travel affect perceptions of territorial belonging? Madeleine Yue Dong provides a glimpse from the view from Shanghai (2011). The China Travel Service was a project of the Shanghai Commercial and Savings Bank to promote tourism in China and abroad. Despite an avowedly cosmopolitan perspective, the articles published by its in-house magazine *China Traveler* "in effect proffered a geography of Shanghai's China from the late 1920s

through the 1940s." The itineraries described give a sense of the extent to which rail did, and did not, serve to integrate a Chinese territory. During the Republican period, Chinese rail connected Shanghai comfortably to—the lower Yangzi (Dong 2011, 203). These accounts also give a sense of the visceral alienation of traveling one's own country by way of foreign infrastructure. Travel to the Northeast was by Japanese ferries and railways, and travel to the Southwest was best accomplished by sailing to Vietnam and taking the French-owned railway north. Only in 1937, on the eve of the Japanese invasion did China Traveler publish a guide to all thirteen of the newly unified Nationalist rail lines (Dong 2011, 211).

3.3. Integration and Expansion in the People's Republic

During the Anti-Japanese War, as the Chinese front in World War II is known in China, the Chinese network was a target for both sides. What little repair work the Nationalists managed after 1945 was undone in the civil war that followed (Köll 2019, 226). Consequently, after 1949 the PRC took possession of a damaged, inchoate and unbalanced rail network of some 21,000 kilometers in eleven unconnected networks, of which only 17,000 kilometers was usable (C.-K. Leung 1980, 96, 133). This shaped the PRC's initial rail construction objectives. In order to rebuild capacity, integrate the network, and extend into the interior, the new Ministry of Railways was well-funded and given wide reign by the central state (Comtois 1990). For Mao, as with Sun Yat-sen, rail was to be a primary mechanism for the production of a modern Chinese nation.

In producing heretofore unimaginable levels of connectivity within the former Qing territory, however, the expansive new network also revealed and heightened tensions between the center and the periphery. Communist ideals of a harmonious, multi-

ethnic *Zhonghua minzu* were put to the test. Mullaney (2011) examines how the PRC handled the question of ethnicity that had stymied early nationalist thinkers. After 1949, social scientists working on behalf of the new People's Republic of China created a new framework for ethnicity in China cleanly detaching it from national identity. The resulting 56 categories were, despite some historical antecedent, radically new, collapsing and "rationalizing" what had been a far more heterogeneous and ambiguous system of ethnic difference. This system realized "the idea of China as a 'unified, multinational country' (*tongyi de duo minzu goujia*)" by fitting China's ethnic diversity neatly within national borders (Mullaney 2011, 1). This transformed China's ethnic diversity from a threat to national integrity to an ideological strength.

This project proceeded alongside rail development bringing peripheral, minority-majority regions into the national transportation network for the first time. Major expansions of the rail network into the interior, such as lines to Chengdu and Lanzhou, began before the first Five Year Plan, though they were not completed for many years (C.-K. Leung 1980, 98–99). Between 1949 and 1978, total track length more than doubled from 21,800 km to 48,600 km (Jiaoe Wang et al. 2009, 767). In addition to expansion, doubling track and otherwise improving existing lines in the densely utilized core were also major goals during the First and Second Five Year plans. By the end of the Third Five-Year Plan, 1966-1970, all the railways in China had been integrated into a single network (C.-K. Leung 1980, 105–6).

The Third Front plan, between 1964 and 1971, saw a massive wave of state infrastructure development in China's still poorly connected and unindustrialized interior: steel and chemicals factories, but also railroads to connect them to the national

transportation grid (Meyskens 2015; Naughton 1988). The most challenging routes were handled by the railway army corps (铁道兵 *tiedaobing*), soldiers reassigned to rail construction in the 1950s (Köll 2019, 240–47). Railway construction took soldiers to distant and inaccessible regions of China, where they labored side by side with locals in relentless, back-breaking work. While the Third Front may have been economic inefficient (Naughton 1988), it was for many regions the closest and most sustained contact with the central state locals had ever had. While the Ministry of Railways thus exemplifies the power of the central state under Mao to reshape local communities, that power was far from absolute, as scholars such as Vivienne Shue (1990) have shown.

As the example of the Third Front suggests, rail construction prior to the reform period was driven by industrial and defense considerations rather than a desire to facilitate passenger travel. After a brief period of free movement in the early fifties (Köll 2019, 257–59), migration within China was strictly limited through the *hukou* household registration system, which tied access to social services to location (K. W. Chan 2009; Xiaogang Wu and Treiman 2004). The notable exception was the Red Guards, who took to the rails to spread permanent revolution to the masses. Travel to China's peripheries, populated by ethnic minorities, reshaped the perspectives of young travelers: "national ethnic harmony mediated by the rail system become part of the ideology of the Cultural Revolution" (Köll 2019, 256). For most Chinese, however, China's frontier territories remained out of grasp, accessible only through its portrayals in cinema and art.

Rail's expanding coverage and social role after 1949 lends credence to Townshend's thesis that Mao-era China underwent a nationalist revolution in infrastructure (1992, 119). Köll (2019)'s excellent survey of China's rail development

sheds light on how the tumult of the Great Leap Forward and Cultural Revolution impacted the operation of railways. The rail system was not wholly immune to the lack of resources and political instability that affected the rest of China. The Great Leap Forward placed heavy demand on freight transport and vilified the technical expertise of railway workers, and during the Cultural Revolution passenger trains carried Red Guards and urban youth into the countryside. In some stations, the Cultural Revolution took root in among railway personnel. The strains placed on the railways caused a steady climb in accident rates and clogged rail lines and developed into chronic inefficiencies that lasted into the 1980s. Xuzhou Railway Bureau became infamous not only for the intensity of its revolutionary struggle but also for the spiraling impact of its chaos: a central hub, it hobbled the national transportation network to the extent that Deng Xiaoping was deputized to intervene in the mid-seventies; an experience that served as a model for his later economic reforms (Köll 2019, 275–79).

3.4. Reform and Opening

Questions of state-making and nation-building took on new urgency in the years after 1978. The processes of reform and opening entailed a dramatic decentralization of power out from the state to the market (F. Wu 2002; D. L. Yang 2004), and down from the center to the local state (Zhu 2004; Hillman 2010; Chien 2013). Despite this devolution, the central state has also strategically reclaimed power when local governments deviate too far from national guidance (F. Wu 2002; Chien and Gordon 2008). New work suggests that the "local developmental state" (Zhu 2004) or "Chinese-style federalism" (Montinola, Qian, and Weingast 1995) paradigms of the eighties and nineties is yielding to a resurgent central state that employs a shifting scalar politics to

undermine local states (Y. Li and Wu 2012; Chien 2013). Discussions of nation and nationalism have also developed rapidly. In the early nineties, the scholarship of Chinese nationalism was concerned with explaining its absence (Pye 1993; Fitzgerald 1995); a series of dramatic nationalist protests in the mid and late nineties shifted the discourse towards an attempt to characterize the nature of Chinese nationalism (Guo 2004; Gries 2004).

Held in check during the Mao era by the *hukou* system, after 1978 the rail system's potential to transform China's population distribution was at long last realized. The wave of economic migrants from poor rural areas in China's interior to the coast's export-oriented industrial zones, commonly termed the "floating population," became the engine of China's economic development in the eighties and nineties (Fan 2008; Naughton 2006). Rapid economic development of coastal China exacerbated the spatial mismatch between energy resources and industries: industry was on the coast, but the necessary coal to power those industries was inland (Mou and Li 2012; Nojiri and Jiang 2007; Todd and Jin 1997). In 2004, half of all rail freight was coal or coke (Luger 2008, 5). Not all of the circulations enabled by rail were neatly contained within the national geo-body: Gladney argues the railway into Central Asia contributed to the transnationalization of Uighur identity, while the railway to Chengdu led to greater conflict and non-identification with the Han majority (Gladney 1991).

Even as it was shouldering a heavier burden each year, the Ministry of Railways received less support from the central state. In the era of marketization, even the rail system was expected to fund itself (Bullock, Sondhi, and Amos 2009; Tjia 2015). A series of measures during the eighties pushed the Ministry to spin off its extensive social

welfare system and seek profit at the bureau and branch bureau scale; by 1986, the MOR was fully dependent on its own income to fund expansion and upgrading (Tjia 2015, 86). The Ministry's workforce shrank by nearly one million jobs between 1978 and 2000 (Tjia 2015, 48, 54). However, the core transport operations remained unaltered until the system began to operate in the red, failing to post any profit between 1993 and 1997 (Tjia 2015, 68, 86). Reforms, however, took a surprising turn: rather than further decentralization and privatization as advocated by the World Bank, instead the Ministry recentralized operations and construction in preparation for its own modern Great Leap Forward.

While rail was quietly rearranging the Chinese landscape (see Figure 2.2), scholars of Chinese nationalism were concerned with questions concerning how the party-state instills its particular vision of the nation into the population. In the late nineties, China was rocked with massive nationalist mobilizations in response to a series of perceived international indignities (Gries 2004; Wallace and Weiss 2015). Many Chinese studies scholars link this "rise" of Chinese nationalism to active state intervention: post-Tiananmen, the state introduced new patriotic education in public schools (Z. Wang 2012; S. Zhao 2004), pushed nationalism through propaganda campaigns and new holidays (Callahan 2006; 2010; Jiayu Wang 2017), and even sponsored video games (Nie 2013). Much of Patriotic Education revolves around the remembrance of China's history of "national humiliation" at the hands of foreign powers. This frames the party as the savior of China, directing popular discontent outwards. It seems to have also focused scholarly attention on international dynamics at the expense of attending to domestic dynamics. Arguing against state-led theories, other scholars conceive of China's contemporary nationalist movements as driven from below, via

popular media (Guo 2004; Gries 2004), with a particular attention to online spaces (Xu Wu 2007; Leibold 2016; Schneider 2018). While patriotic education is an obvious feature of contemporary China, empirical investigation has failed to show that it has an impact on the beliefs of students and citizens (Fairbrother 2008; Qian, Xu, and Chen 2017).

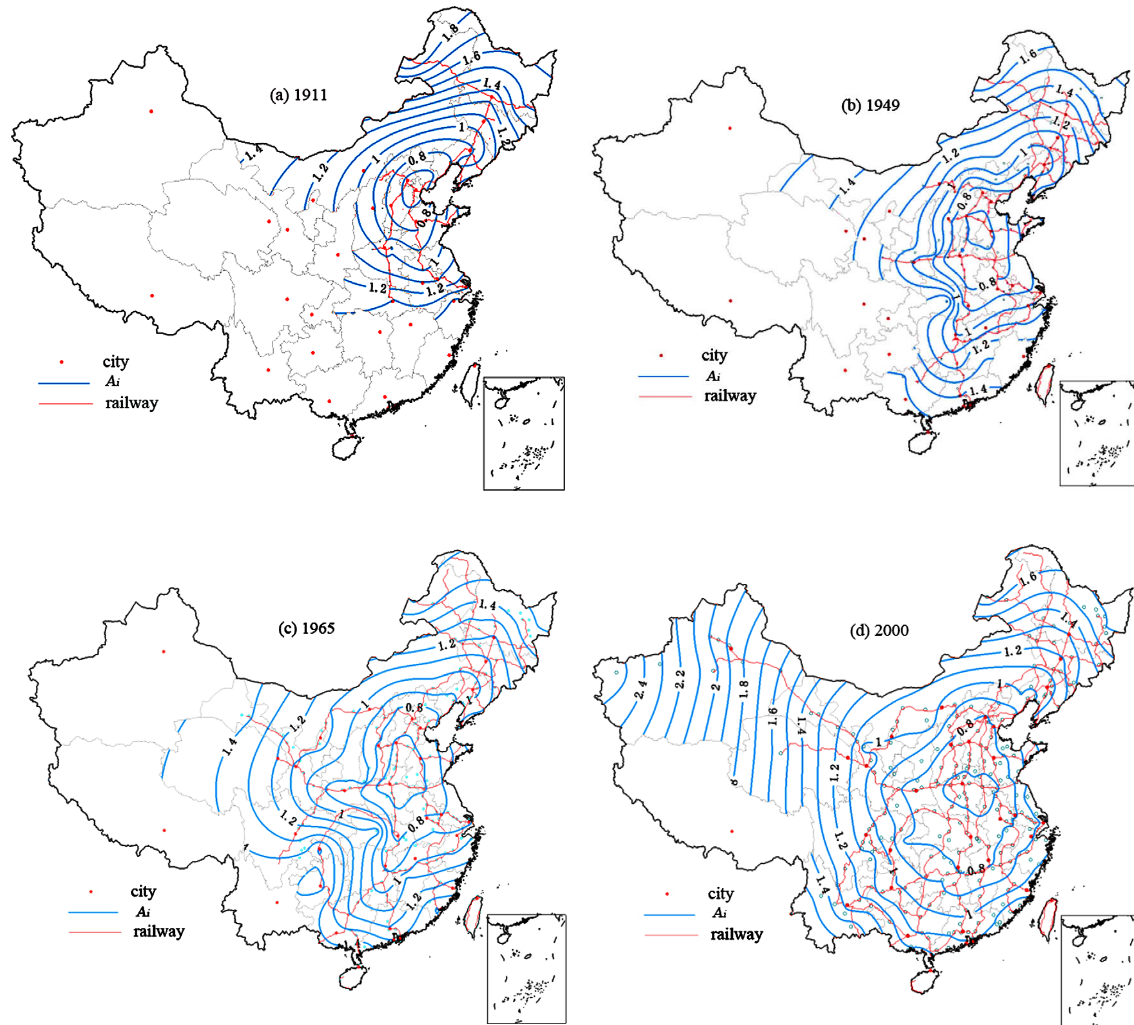

Figure 2.2. The accessibility coefficient of the Chinese railway network in 1911, 1949, 1965 and 2000. Source: (Jiaoe Wang et al. 2009)

3.5. The Rise of High-Speed Rail and the Resurgent Central State

In the mid-nineties, the trend towards decentralization and devolution slowed, and reversed. Central state expenditures as a percentage of GDP reached a nadir in 1995, at ten percent, before climbing to nearly a quarter by 2012 (Naughton 2014). As central state coffers have filled, local states' have emptied, forcing local government to increasingly rely on complicated land transactions employing so-called Local Government Finance Vehicles (LGFVs) to fund the economic development under which they are evaluated (M. Y. S. Zhang and Barnett 2014). While provincial and urban governments are not easily yielding the power they have accumulated, the central state has undertaken a process of reconsolidation (Y. Li and Wu 2012). This process is evident in development of Chinese rail since the late nineties.

China's rail system, long holding a monopoly on long distance passenger travel, first faced serious intermodal competition in the nineties. The rapidly expanding National Trunk Highway System and a civilian air transport network built nearly from scratch offered cheaper or faster options for domestic travelers (Fallows 2012; Si-ming Li and Shum 2001; Jiaoe Wang, Mo, and Wang 2014). China Rail responded by increasing speed and quality of service. A series of campaigns between 1997 and 2007 saw the average speed of passenger trains increase by more than 40% (Bullock, Sondhi, and Amos 2009, 36–37). Through the mid-2000s, the rail system was constantly operating at the edge of capacity for both passenger and freight traffic, and struggled to improve speed and thorough-put (Luger 2008). At the same time, profitability was lagging: the costs of upgrades were outpacing increased revenues.

On the cusp of major reform in 2002 and 2003, under the leadership of Liu Zhijun the Ministry ended up embarking instead on its most ambitious and wide-ranging development push in its history: the launch of new passenger-dedicated high-speed rail lines (HSR). The 2004 Mid to Long Range Network Plan (MLRNP) laid out a sweeping plan for the reform and expansion of the Chinese rail system, centering on the establishment of what is essentially an entire second set of railways across the entire country. China's HSR network has expanded with incomprehensible speed since the opening of the first line (see Figure 2.3). By 2016, total HSR track in operation reached 22,000 kilometers, more track than existed in all of China in 1949 (Chen et al. 2019; Jiaoe Wang et al. 2009, 767). HSR continues the process of time-space compression of which rail has long been emblematic (Schivelbusch 1986): the travel time between Beijing and Shanghai is five hours by HSR, and more than fourteen hours by conventional train. Rail continues to play a central role in China's transportation system than in other countries; despite the rapid growth of road and air networks, rail remains a competitive option for many Chinese travelers at medium to long distances (Luger 2008, 41; Zhou et al. 2014). Since 2000 the Chinese network has rapidly deepened and expanded: passenger traffic grew at an average of more than 5.5%, and freight by 6% between 2000 and 2013 (Zhou et al. 2014), and reached a total ridership of over 3 billion in 2017 (National Railway Administration 2018). Subtler yet arguably more important than raw speed, however, are dimensions of convenience and comfort (C.-S. Chan and Yuan 2017; Givoni and Banister 2012). HSR carriages, and to a lesser extent HSR stations, are built to remarkably different standards of comfort and convenience, with

different expectations for the cleanliness of facilities, the comportment of personnel, and the behavior of passengers.

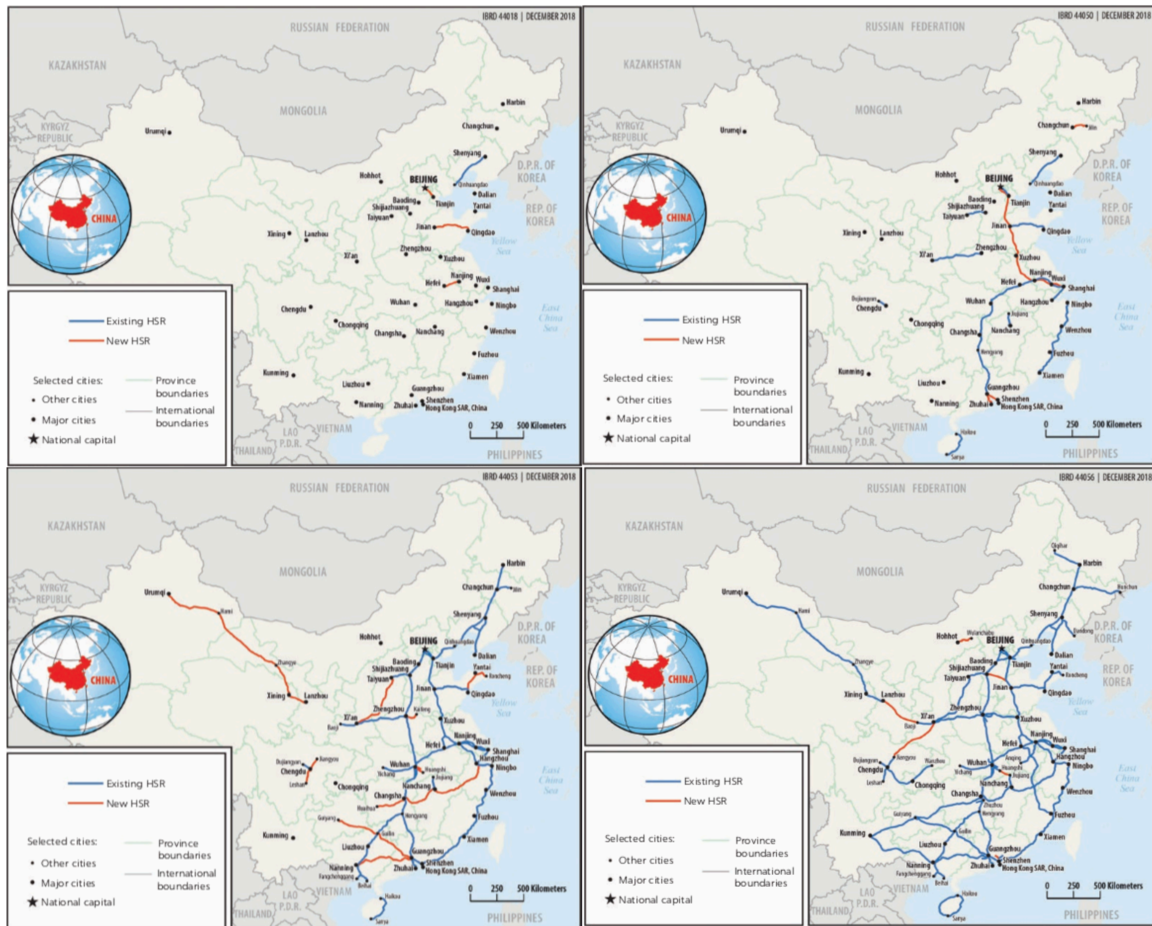

Figure 2.3. Expansion of China's HSR network, 2008-2017. From top to bottom, left to right: the network in 2008, 2011, 2014, and 2017. Source: Lawrence, Bullock and Liu 2019.

HSR has brought rail back to the center of state-making and nation-building in China today. The HSR network is a key part of the state's plan to manage urban growth and alleviate regional disparities, directing migrants into second- and third-tier cities outside of the hyper-developed coastal provinces (Chen et al. 2019). The rail system is also being incorporated into new state apparatuses of citizenship, surveillance and security through the implementation of the "real name" system (Brown 2008; Hoffman

2017; Leibold 2019). As reflected in the names of the Chinese-built HSR trainsets, *Hexie* and *Fuxing*, HSR has become symbolic of the triumph of the party-state and its economic development (see Figure 2.4). Unlike the spectacular but transient nationalism of events like the 2008 Beijing Olympics (Callahan 2010), HSR endures, becoming part of everyday life.

As an enduring symbol of the state, it has also become a source of vulnerability: rail disasters, whether in the form of a malfunctioning ticketing system or a deadly crash, can rapidly transform into critiques of the state itself. While events such as the 2008 Sichuan earthquake and the 2011 Wenzhou train crash both mobilized China's national community in transformative ways, their impact on state legitimacy were quite different. An extensive literature examines these events, often from the vantage of online discourse (D. L. H. Hui 2009; Jieying Wang 2010; B. Xu 2013; Bondes and Schucher 2014; Sullivan 2014; Schneider and Hwang 2014; deLisle, Goldstein, and Yang 2016). The Sichuan earthquake spurred a wave of nationalist volunteerism reinforcing and legitimating the party-state's rule (D. L. H. Hui 2009; B. Xu 2013). The Wenzhou crash, in contrast, mobilized the national community against the state's perceived indifference and corruption. As one Weibo poster writes: "HSR is not for the state's benefit, it's for the entire people's benefit! If the entire people's benefit got damaged, the entire people have the right to investigate!" (quoted in Bondes and Schucher 2014, 55). The poster speaks on behalf of a national community contiguous with the state, but one that is only contingently aligned with the state.

Figure 2.4. China's expanding rail infrastructure has become a key pillar of the state's nationalist legitimization narrative, and a key site for the dissemination of that narrative. Wuhan Station, 2016.

4. Conclusion

This geographic and historical context suggests the central role the rail infrastructure has played in state-making and nation-building in modern China. The practices of passengers in navigating rail space interlock in crucial ways with the function of rail infrastructure and with the traveling experiences of others, and therefore become sites for intervention. By reshaping how passengers move through rail space, these interventions produce a new kind of passenger subject. This subject is newly legible to the state, and trained to a new degree of social discipline.

These findings also indicate that the advent of HSR did not represent simply a speeding up of rail travel, but an attempt to transform its social character. This fragile new “civilized” version of rail space is deliberately shielded from the conventional rail system at the level of carriage and station when possible, but waiting room by waiting room when necessary. In part, this new bifurcation of rail space echoes growing socio-economic gaps in China’s political economy. Yet it also realizes those gaps in a visceral way for tens of millions of Chinese passengers. The social nuances of rail space’s contemporary developments are important context for understanding incidents like the 2015 city-wide protests in Linshui in response to being bypassed by the proposed HSR route: increasingly in China, if you are not onboard HSR, you are being left behind.

This research project challenges and complements the existing research into the nation-ness of Chinese rail by adopting a passenger’s perspective on the experience of navigating through the interiors of Chinese rail space to reveal the ongoing production of Chinese nation-ness. In the following section I situate the contemporary rail system geographically, and summarize the salient features of the rail travel experience in order to

examine how they realize both coherence and fracture within rail spaces and communities of practice.

CHAPTER III

METHODOLOGY AND DATA COLLECTION

1. Introduction

In this chapter, I introduce the methodology behind this dissertation's investigation of contemporary Chinese rail, as well as the data collection methods used. In order to understand the rail system as a more-than-human assemblage, I primarily employ an ethnographic methodology centered around participant observation. However, as formulated by scholars such as Geertz (1973), Clifford and Marcus (1986), ethnography understands society discursively: as assembled from signs, symbols and texts. To study society as a more-than-human assemblage, I synthesize an alternative conception of ethnographic research drawn from the critiques of scholars in science and technology studies, anthropology, and geography. Feminist STS thinkers such as Haraway and Barad challenge the validity of the "reflective" metaphor, arguing that the act of research is not failed mimicry but productive interaction. Similar critiques are evident in the methodologies of mobility studies scholarship of the passenger, political geographers' examinations of embodiment and the everyday, and STS investigations of the materiality of infrastructure. Affective, non-representational, and materialist methodologies all gesture towards a world that is not reducible to text. The resulting methodology articulates my fieldwork data, in the form of field notes, photographs and interviews, to rail space in all its more-than-human dimensions—not through a naïve empiricist assumption of correspondence but by understanding the research as situated in the same world as its subject.

While this dissertation seeks to excavate the power of materiality in shaping nation-ness, my goal is to situate, not to dismiss, the role of discourse. If things are textual, then texts are also things. Rail space is a profoundly discursive space, saturated with signs and symbols. My fieldwork's deep engagement with the materiality of rail space highlights how the concrete specificity of these signs is inextricable from the meaning they communicate. Much of this discourse, it turns out, is about things. More so than ad copy or political slogans, rail space is full of directions on how to pick up tickets, reminders to carry identification, and how to use the various affordances of rail space. This fieldwork shows the impossibility of sorting matter and discourse apart. Only after producing this account of rail space as a material and discursive assemblage of people, things and infrastructures could I begin the second phase of research on how the things of rail space shape discourses of nation and region. This textual analysis of mainland narratives of the Express Railway Link in the Pearl River Delta, examined how non-human things like tickets and identification generate meanings of their own, shaping different spatial imaginaries within mainland newspapers. This discursive analysis grounded in materialist ontology brings this project's more-than-human methodology full circle.

2. More-than-Human Methodologies

Chinese rail spaces can be chaotic and fast-moving, overwhelming the senses. As you enter the station, speakers blare announcements and personnel shout directions over the dull roar of the station's hustle and bustle. Every surface is covered with directions, timetables, how-to guides, warnings and prohibitions, advertisements, slogans, and storefronts. An army of cleaners conducts an endless campaign against detritus: the stink

of sweat, urine, and garbage compete with the scents of cigarette smoke, cleaning products and perfume. Through all this the rail passenger must navigate, while keeping ready to hand the requisite identification which renders them legible and ticket which authorizes their passage, and luggage which encumbers them. This task is challenging physically as well as mentally: luggage can be unwieldy, and stations are vast.

At other moments, rail space is oppressively uninteresting. Once seated in the carriage, the challenge is not parsing through a multi-sensory assault, but staving off boredom. This space demands a different set of skills. Passengers must meet their own needs for sustenance, comfort and entertainment while enduring the inevitable impositions of other bodies in tight confines and striving to keep their own impact on others within acceptable bounds. In the distant intimacy of the carriage, traces of the other passengers permeate the space: loud WeChat conversations and cellphones streaming action movies pierce through background rumbles and creaks of the train's movement; the smell of food, body odor and occasionally cigarette smoke drifts through the carriage. These practices, for all their apparent passivity, are also actively called-upon, and parallel the embodied, physical and mental challenges of navigating stations.

This experience—materially embodied and skillfully practiced—is at the center of the analytical field in this research project. The passenger is here conceived not as a predetermined identity but as a position interpolated through a set of practices situated within a richly material and meaningful environment (Ingold 2002; 2011). These practices employ a distinctive suite of tools or objects to navigate the challenges of rail space, from purchasing a ticket to passing the long empty hours of the journey. These practices and objects are, moreover, situated within a particular infrastructural

environment which gives them function and meaning. Within each element of practice, things, and environment, there are culturally specific particularities which mark them as Chinese—which is to say, constituent of the Chinese assemblage. Yet these particularities are neither homogenous nor universal: for many passengers, their practices are marked by their rejection of or exclusion from the norm. These differences nonetheless still articulate a relation to Chinese nation-ness; by investigating these differences, I argue this research sheds light on the ongoing production of China as a community and as a territory.

In order to investigate the practices of being a passenger in the Chinese rail system and to see how they are entangled with the things and infrastructures of rail, I put myself in the position of passenger. Drawing on affective (Crang 2003; Dewsbury 2010), more-then-human (Dowling, Lloyd, and Suchet-Pearson 2017; Panelli 2010) and materialist (N. J. Fox and Alldred 2015) methodologies, I employed myself as a research instrument, registering the physical and mental impacts of rail travel and examining the practices of rail travel through my own process of learning (Lave and Wenger 1991).

2.1. From Reflexivity to Diffraction in Ethnographic Research

This research project draws primarily on findings from participant observation. Participant observation, as a qualitative methodology and research practice, dwells in the shadow of long-standing debates over the validity of ethnography. The first question that haunts ethnographic work is: what sort of truth claims does ethnographic data make possible? Within anthropology, an early insistence on positivist objectivity gave way, in the ferment of the cultural turn, to a view of ethnography as a constructed, always partial narrative of reality (Clifford and Marcus 1986). This conception of ethnography

entrenched a view of ethnography as a practice of writing. Moreover, it foregrounded the second question haunting ethnography: what is the role of the researcher in the production of ethnographic findings? The re-vitalized theorization of researcher subjectivity as a central aspect of ethnographic knowledge gave rise to the concept of "reflexivity." Beyond the question of "bias" or "distortion" of an underlying truth—a framework that is still implicitly realist—reflexive ethnographies strive to reflect on how the researcher's social position relative to axes of gender, race, class, religion and other social categories shape the data gathered and the findings generated (Pink 2009; 2013).

At this juncture, scholars of feminist science and technology studies (STS) make a pivotal intervention (Haraway 1988; 1997; Barad 2007). Haraway's critique of reflexivity is that it gives up more claim on truth than it ought to scientific positivism. By confining its conception of "truth" to textual representation, it concedes the non-discursive world altogether.

> [M]y suspicion is that reflexivity, like reflection, only displaces the same elsewhere, setting up worries about copy and original and the search for the authentic and really real. Reflexivity is a bad trope for escaping the false choice between realism and relativism[.] (Haraway 1997, 16)

Haraway's well-known critique of the "God trick of seeing everything from nowhere" is paralleled by an often-overlooked critique of "the lovely and nasty tools of semiology and deconstruction" (1988, 577). Her central concern in "Situated Knowledges" is to outline the conditions for knowledge of reality: simultaneously an account of the radical historical contingency of all knowledge claims, both other's and our own, "*and* a no-nonsense commitment to faithful accounts of a 'real' world" (1988, 579, emphasis in original). Haraway's proposal is to attend to the particular material and

semiotic prostheses through which we come to “see”—yet always from certain point of view, through a certain body's eyes.

Barad (2007; 2014) takes up diffraction, Haraway (1997)’s proposed alternative to reflexivity, in developing an account of social and scientific practice that is part and parcel of reality’s own process of self-production.[*] Where reflexivity attends to sameness, diffraction centers the production of difference (Barad 2014). Barad examines quantum experimentation through the lens of Foucault’s apparatus (1979) and Butler’s performativity (1990) to forge a novel account of the emergent reality of bodies as discursive-material things. Neither photons nor human beings enter the scene as independent agents with determinate boundaries and properties, but only become distinct and take on exclusive properties in relation to their mutual entanglement (2007, 33). Barad shows how in even the most rigorous of the “hard” sciences, the researcher’s racial, gendered, and national relations are never excised, only more or less thoughtfully accounted for.

This dissertation takes this radically constructivist but also realist ontology as a guide in two senses. This lens shapes my understanding of how it is that passengers, things and infrastructures co-produce each other as components in a more-than-human assemblage. Moreover, it shapes my understanding of how I, as the researcher, relate to the object of my study (N. J. Fox and Alldred 2015). Yet while this theoretical frame opens up fascinating and productive avenues for investigation, it does not provide any clear methodological guidelines. In order to work out what the units of analysis are for

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[*] For a detailed account of Baradian diffraction, see Chapter VIII.

my research and what methods I used to gather data on those entities, I synthesize a range of literatures in geography, anthropology and STS. Human geography has developed novel methodologies for examining questions of affectivity, performativity, and the body; here I focus on the literature on passengers and on nation-ness. To examine the non-human elements of the rail system, I pull together a body of research taking infrastructure as its central object of inquiry.

2.2. Ethnography of the More-than-Human World

Within human geography, qualitative research has in the past few decades undergone a period of rapid methodological proliferation: the "standard suite" of research methods of participant observation and interviews has expanded to encompass a much wider range of approaches (Crang 2003). In his influential 2003 review, Crang asks "whether methods often derided for being somehow soft and 'touchy-feely' have in fact been rather limited in touching and feeling" (2003, 494). His target here is research that prioritizes text and representation over the performative and haptic nature of qualitative work (Nash 2000). In the years since, human geographers have developed novel methods and methodologies that engage the question of the body as an instrument of research (Longhurst, Ho, and Johnston 2008). These new approaches draw on emotional (Longhurst, Ho, and Johnston 2008), affective (Kraftl and Adey 2008; Lapiņa 2018; Sumartojo 2017; Tolia-Kelly 2006), and visceral (Hayes-Conroy and Hayes-Conroy 2010; Sexton et al. 2017) dimensions of embodiment to reconceptualize ethnographic research not as the production of text but as a multi-sensory, affective engagement with the world. Centering the body introduces a greater sensitivity to materiality without losing sight of discourse: affective theory in particular draws on Spinoza (2002) by way

of Deleuze (1988) to frame emotional and physical impacts on bodies within a shared theoretical register (Dewsbury 2015; Thrift 2008; Tolia-Kelly 2006).†

2.2.1. Passengers and Practice

Work on affect and embodiment in human geography has examined both transportation and nationalism, but rarely at the intersection of both (notable exceptions include Edensor 2002; 2004; Löfgren 2008). Geographers and anthropologists working on a range of transportation systems have drawn on affect and embodiment to examine the passenger as an object of study (Adey 2009; Adey et al. 2012; Jain 2011; Vannini 2011b). Centering bodily practice draws into focus the temporalities and spatialities that travel constructs (Dalakoglou and Harvey 2012; Harvey 2010; Watts and Urry 2008) and the role of non-human things—objects and infrastructures—which enable and constrain (Adey 2009; Bissell 2009b; 2018, Ch 4; Crang and Zhang 2012; Kraftl and Adey 2008; Watts 2008).

Bissell's work in particular centers the passenger within an ecological analysis of the spaces and communities which constitute transit (Bissell 2018). Bissel's work situates the traveling body vis-à-vis technosocial assemblages of luggage (Bissell 2009b), carriage (Bissell 2010b), and the transient but tangible society of passengers (Bissell 2009a). In addition to examining visceral questions of comfort and discomfort (Bissell 2008; 2010a), a rich vein within Bissell's work centers on questions of skill. Watts describes train travel as a *crafting*, a "technical praxis, as derived from the Greek *tekhne*.

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† Non-representational theory (Thrift 2008) informs much of the geography research on affect and embodiment. However, like others (Nash 2000; Tolia-Kelly 2006), while non-representational theory centers on many of the things I wish to study, I do not find it illuminating as to how to do so.

It is the competent expression of a method; a skilled manipulation that transforms" social and material relations (2008, 712; cf. Vannini 2011b). Yet the craft is often submerged; "beneath the threshold of conscious attention," Bissell argues, "lies a whole series of fine-grained experiential knowledges that commuters develop over time, enabling them to traverse urban transport systems with ease" (2018, xx).

The unconsciousness of skill poses a methodological challenge: how to investigate skills that passengers don't even know they have? One approach is to focus on points of rupture: Löfgren, after frustration with participant observation methods, takes a historical approach to examine the skills of rail travel and their materialization of class at the moment of their development (2008). Watts (2008) conducts a mobile (auto-)ethnography to collect data on the crafting of train travel (Watts and Urry 2008). I also draw inspiration from other cultural geographies of skill, which use "legitimate peripheral participation" of the learning process (Lave and Wenger 1991) as a form of participant observation (Adams 2018; Grasseni 2007; Hunt 2018).

The approach to skill and practice in this literature draws a great deal on the thinking of anthropologist Tim Ingold (2002; 2011). Ingold's work has been conducive to geographers in part due to its emphasis on skill's situated-ness within particular environments. Cultural geographers have drawn on his concept of "taskscape" in thinking through the co-production of practice and place (Bissell 2009b; Hunt 2018; Patchett and Mann 2018; Vannini 2011a). This body of work is invaluable for thinking through the methodology of this research project, and forms the core of my analytic of the passenger,

object, infrastructure assemblage.[‡] However, it does not address the other aspect of my research—the extent to which these practices and spaces are national. In conceptualizing nation-ness and selecting methods for its investigation, I draw on work within political geography and the study of everyday nation-ness.

2.2.2. Nation-ness and Bodies

Everyday nationalism or nationhood, building on Billig (1995)'s influential formulation of banal nationalism, examines the ways in which nationalism is reproduced through the processes of everyday life (J. E. Fox and Miller-Idriss 2008; Skey and Antonsich 2017; Closs Stephens 2016). In contrast to "hot" nationalism, everyday nationhood examines how the nation lurks in the background—the language of road signs, the nation-state boundary used in weather maps—as well as how it surges to the fore (R. Jones and Merriman 2009). Much of this work, however, continues to center on nationalist symbolism (Airriess, Hawkins, and Vaughan 2012; Batuman 2010; Raento and Brunn 2005) at the expense of engaging with nation-ness as an embodied practice or material environment. The work of Tim Edensor is an early exception (Edensor 2002; 2004), recently taken up to explore the emergent nation-ness of everyday life (Edensor and Sumartojo 2018; Sumartojo 2017). Merriman and Jones have examined the role of the built environment in nation-ness, arguing for a greater engagement with the affective role of material objects in the re-formation of national territories and communities (R. Jones and Merriman 2012; Merriman 2016; Merriman and Jones 2016). While Ingold

[‡] For an in-depth treatment of Ingold's thinking on environment and skill, see Chapter VII.

also serves as a touchstone within this body of work, scholars of everyday nationalism draw on Ingold's thinking on place and perception rather than his thinking on skill.

Also engaging affectivity, scholars building on feminist accounts of embodied nationalism (Mayer 2004; Yuval-Davis 1997) have examined nation-ness as a phenomenon that is experienced quite differently by those in differently gendered and racialized bodies (Desbiens 2004; Dowler 2002; Lapiņa 2018; Radcliffe 1999). This literature draws on affective and corporeal approaches to investigate how bodies are produced in relation to "the distant (invisible) horizon" of nation (Radcliffe 1999, 213). Where everyday nationhood has tended to presume a relatively homogenous nation (Skey and Antonsich 2017, 3), feminist scholars have highlighted the variegated patterns of inclusion and exclusion within national communities. A handful of scholars employ their own affective, corporeal body as an instrument of research to qualitatively investigate the embodiment of nation-ness (Lapiņa 2018; Militz and Schurr 2016). Lapiņa (2018) utilizes her ambiguous position as a "passing" migrant to autoethnographically examine the affective contours of whiteness, and Militz (2017; Militz and Schurr 2016) uses her own body as an instrument to record the affective impact of participation in nationalist celebrations.

The engagement with embodiment within political and cultural geography has come, ironically, at the cost of an engagement with space itself. Lapiņa (2018) and Militz (2017) attend to the bodily affects of nation-ness, but have little to say about how the nationalized body relates to nationalized spaces, or national territory. Scholars of mobilities and transportation have employed affective methods to investigate the spaces *inside* transportation infrastructures (Adey 2009; Jain 2011; Kraftl and Adey 2008;

Merriman 2016) and have at times examined how those networks shape exterior spaces at a regional scale (Vannini 2011b). Yet a gap remains between the shaping of bodies and the shaping of space. In order to engage methodologically with the built environments of rail space and conceptualize how these non-human things become entangled with nation-ness, I draw on a body of scholarship that takes infrastructure as its unit of analysis.

2.2.3. Infrastructure and the Non-Human

My methodological approach to the non-human elements of rail space synthesizes work emerging out of ethnographic investigations of infrastructure within STS and anthropology (Larkin 2013; Star 1999) and the work of human geographers and historians studying infrastructure at the boundary of society, nature, and the state (Carse and Lewis 2017; Cronon 1991; Graham and Marvin 2001). Human geography and STS treat infrastructure in distinct, potentially complementary ways: geographers typically privilege political, economic and social factors, while STS tends to privilege the technical at the expense of social and spatial processes (Furlong 2011). An important strand within both literatures, though not always explicitly theorized as such, is the investigation of how material things both actualize and also subtly transform social relations. Building on the thought of the material turn (Bennet and Joyce 2010; Coole and Frost 2010b; Whatmore 2006), in my fieldwork I seek to investigate how the material force of non-human things is put to work within society, without ever becoming reducible to those social relations (Dowling, Lloyd, and Suchet-Pearson 2017). Non-human things are and remain actors, as capable of transmuting social relations as they are of transmitting them. A methodological engagement with materiality shifts “the focus for social inquiry from an approach predicated upon humans and their bodies, examining instead […] relational

networks or assemblages" (N. J. Fox and Alldred 2015, 399). A materialist lens, therefore enables me to extend the affective methods examining passengers and nation-ness to include non-humans, producing a more-than-human ethnography.

Ready-to-hand (Heidegger 1996), things contour the shape of everyday life, enabling and constraining practice at the most immediate and visceral level (Ingold 2002). At the corporeal scale, non-human things enable novel sorts of bodily comportment (Ash 2017), though this more-than-human entanglement is underdeveloped in the literature (exceptions include Bissell 2009b; Edensor 2002). These individual things, however, also circulate, and in their movements serve to coordinate the interplay of multiple communities of practice within heterogeneous social networks (Star and Griesemer 1989; Bruni 2005). Star and Griesemer (1989; cf. Bowker and Star 1999; Star 2010) argue that the indeterminacy of certain things allows them to play different roles in different social contexts while remaining stable enough to knit those contexts together. At odds with Star's non-hierarchal framework, a growing body of political geographers examine how mundane things constitute and realize state power in everyday life (Darling 2014; Dittmer 2017; Meehan, Shaw, and Marston 2013). Yet even as the materiality of things is put to work realizing social relations, they also preserve an "excess" that renders them unpredictable (Coole and Frost 2010b, 9; cf. Meehan 2014).

At sufficient standardization and scope, things undergo a shift from tool to infrastructure: they do not simply mediate a relation to the environment but become the environment itself. The power of the non-human in constituting social reality is embedded yet deeper, and its power to unsettle that reality grows correspondingly stronger. At the border between society and nature, the capriciousness of the non-human

manifests as a moment of "uncanny," as infrastructures taken for granted suddenly behaves in unexpected ways: faucets fail to run, toilets fail to flush (Kaika 2005, 68–69). This unsettles not just people but state: hydraulic infrastructures promise to concretize the power of the state in the form of dams and levees, yet the resulting socio-natural hybrids entangle the state in a web of relations it cannot fully control (Akhter 2015; Kaika 2005; Meehan 2014; Swyngedouw 2014). Infrastructure's capacity to transform the state even as it makes it is illustrated in historical studies. Mukerji argues that infrastructure exerts a "logistical" power of unexpected potency, capable of giving rise to "unintended" state structures (Mukerji 2009; 2010b; 2010a). In England, road-building unified the countryside—in a rebellion against the centralized state (Guldi 2012). In India, the colonial railway inadvertently produced anti-imperialist solidarity at the sub-continental scale (Goswami 2004).

Examining for whom infrastructure works is therefore a subtle but powerful method for revealing social fracture. Yet at a historical remove, an account of its affective impact on everyday life is difficult to assemble. STS scholars have developed methodologies for conducting fine-grained analyses of infrastructure, but rarely coupled them with an attention to the national scale. De Laet and Mol (2000) is a standout exception: their analysis of the Zimbabwe Bush Pump "B" Type centers the pump within an analysis of its community-building and spatializing relations at multiple scales. "[W]hile nation-building may involve writing a shared history, fostering a common cultural imagery or promoting a standard language, in Zimbabwe it also has to do with developing an infrastructure for water" (de Laet and Mol 2000, 235). Whereas de Laet and Mol suggest this is unique to Zimbabwe's nation-building, the wider literature

suggests that infrastructure, particularly transportation infrastructure, is often central to nation-building (Goswami 2004; Kezer 2009; Merriman and Jones 2016).

Investigating infrastructure poses a challenge. The ethnography of infrastructure is, as Susan Leigh Star puts it, the study of "boring things" (1999, 377). Like everyday practice (Bissell 2018; Löfgren 2008), infrastructure tends to step out of conscious awareness, becoming the invisible backdrop or transparent medium for action. Yet as Star notes, this invisibility is highly contingent: "For the person in the wheelchair, the stairs and doorjamb in front of a building are not seamless subtenders of use, but barriers. One person's infrastructure is another person's topic, or difficulty" (Star 1999, 380).

Breakdown is one point where infrastructure becomes visible, rendered opaque in failure (Star 1999, 381–82). Some scholars of infrastructure take these points of breakdown and disrepair as sites of study (Chu 2014; Graham and Thrift 2007). Another point of entry is the introduction of the new infrastructure—or the introduction of new users. As Star notes, infrastructure is animated by communities of practice, the members of which have learned its proper use (Star 1999; cf. Lave and Wenger 1991). New infrastructure requires an educational project that leaves pedagogic materials behind. Early railroads in Europe (Schivelbusch 1986) and China (Köll 2019, 154) produced voluminous how-to manuals and etiquette guides, covering everything from purchasing tickets to conversing with fellow passengers. Rail spaces became classrooms, "railway travel became a form of schooling, turning people into modern citizens" (Löfgren 2008, 349).

2.3. Lessons for a More-Than-Human Methodology

Where does this leave us in terms of understanding how to approach the nation-ness of rail travel? The tendency of embodied practices and infrastructural relations to slip out of focus presents a methodological difficulty of the first order: simply "seeing" their particularities requires an awareness that is not possible for either consummate insiders or detached outsiders. Charting the contours of traveling practice and national community requires blurring insider/outsider distinctions by approaching their boundaries without wholly crossing over.

This question of boundaries connects a Baradian ontology of diffraction (2007) to the embodied experience of fieldwork described by Lapiņa (2018) and Militz (2017). Both these scholars investigate nations they are not members of by focusing on moments when their (in/ex)clusion became particularly affectively salient in emotional, corporeal and social registers. As a Danish-passing migrant, Lapiņa (2018) analyzes cases where her whiteness enclosed her bodily within Danishness, even as brown-skinned bodies are excluded; a racial difference diffracted across national difference. Militz examines how an affect of awkward out-of-place-ness indexed her visceral identification of certain styles of dancing as national (2017). Studies of travel provide an interesting counterpoint: here the researcher and their subjects start as consummate insiders, putting their tacit skills to work without conscious awareness. Instead, awareness emerges only at points of breakdown. Bissell analyzes cases where unwieldy bodily configurations—carrying a bike on board, or the onset of chronic injury—render the familiarity of rail travel suddenly, awkwardly present-at-hand, transforming transportation systems from transparent medium into a problem to be solved (Bissell 2009b). These scholars employ

bodies as research apparatuses (Barad 2007) to bring the boundaries between skill and ineptitude, and between belonging and out-of-place-ness, into focus. The particular diffraction patterns that these methods reveal are real and also contingent on the bodies through which they are produced.

My fieldwork attends to the subtle interplay of belonging and out-of-place-ness I experienced while traveling through the rail system from a dual vantage. Entering Chinese rail space, I was simultaneously entering two communities of practice with sharply different criteria for membership. Ticket in hand, I was as much a railway passenger as anyone else, albeit a novice one. Yet no length of time spent in rail space, no skillful mastery of the idiosyncratic nuances of station layouts and carriage sociality would transform me into a member of the Chinese national community. In this sense, what I was investigating—all I could investigate—is the contours of the relation between these two communities of practice. The boundaries of what is distinctively Chinese about the Chinese rail system made themselves evident to me through my exclusion from them.

Learning the bodily practices of Chinese rail travel and passing through its spaces served as an exploratory method for bringing to light particular things and infrastructures though which Chinese-ness is realized—hot water taps, tickets, cellphones, instant noodles and so forth. This affective engagement served as the entry point for a descriptive analysis of the material and discursive assemblages which these things and spaces constitute, transmit, and transform. Two examples illustrate how learning rail space illuminated the specificities of Chinese rail space. When I began my travels, I used a hiking backpack, assuming that would be the least cumbersome way of traveling through rail stations and carriages. I immediate became acutely aware of how the

backpack stuck out: it was distinctively out-of-place among the luggage of Chinese passengers. It proved cumbersome as well: clipping in and out to pass through security—sometimes necessary multiple times in a single journey—was a hassle, and hanging straps spilled out awkwardly in the tight confines of carriages. A wheeled suitcase, I found, was far less bothersome: it was far easier to move through security checks and stow onboard. Moving with wheeled luggage, I saw the infrastructure differently as well: not only did I appreciate smooth rolling surface of plazas, stations and platforms, I noticed the smooth ramps along the sides of station staircases which allow passengers to move between levels without carrying the full weight of their luggage (Figure 3.1).

Figure 3.1. In Kunming Station, a passenger takes advantage of the rampway to lower their luggage to the boarding platform.

One example of how the Chinese rail system is embedded with Chinese-ness is language: the combined impact of signs, directions, advertisements and announcements makes rail space intensely textual (see Figure 3.2). My non-native fluency in the Chinese language made of these symbols a semi-opaque barrier rather than a transparent medium of communication. I was consequently highly conscious of how dependent smooth movement through rail space is on literacy in a way my respondents were not. Yet literacy comes in multiple forms: despite the language barriers I quickly became a fluent user of ticket buying apps, whereas I found that many of my older respondents rely on children and grandchildren to book their rail tickets on their behalf.

Figure 3.2. Shenzhen South Station. Written Chinese is materially embedded throughout rail space.

These examples offer a glimpse of how participating in and learning the practices of rail travel shed light on the interplay between traveling skills and nation-ness within Chinese rail, posing new questions and opening new avenues for investigation into the entanglement of society and infrastructure. I now turn to the research itself.

3. The Practice of Research on the Train

Following Watts (2008), I traveled by rail in an ethnographic exploration of the practices of inhabiting rail infrastructure. As the nation-ness of rail is precisely what is under investigation, my field site was not delineated as any subset of the network, but as "rail space"—the interconnected plazas, stations, and carriages of the Chinese rail system. Addressing a vast and scattered field site like this presents a certain challenge. To address this challenge I drew on multi-sited ethnography in conceptualizing the field for this research project. Multi-sited ethnographies emerged in response to a perceived need to engage with the centrality of global linkages to social life: ethnographic accounts could not simply be of locales (Marcus 1995). Multi-sited ethnography has a particular affinity for mobility and circulation: "the multi-sited approach feels necessary in many circumstances as a faithful reflection of lives lived not in discrete locations, but through various forms of connection and circulation" (Hine 2007). Multi-sited ethnographies have been employed to trace the transnational flows of immigrants and global elites (Falzon 2009; Hannerz 2003), but rarely to national circulations, making my use of multi-sited methods somewhat idiosyncratic. Multi-sited ethnography foregrounds the constitution of the national scale through the connections and flows the rail system enables.

I broke my research into two interlocked components. My participant observation employed two distinct research strategies: extensive, and intensive. I explored a wide

variety of different routes across China to examine the system's diversity, and I rode select routes repeatedly to build a familiarity with local rhythms. These travels gave me a first-hand sense of the physical and mental demands of rail travel as well as the opportunity to observe how others navigate and inhabit rail space. The conceptual and bodily insights from participant observation proved to be invaluable context for the: interviews I conducted with rail travelers. Speaking with a broad cross-section of rail travelers illuminated how people of different ages, genders, home regions and social classes understand and make use of rail space in distinct ways. This passenger's-eye view of the rail system informed my reading of XRL narratives in the second phase of my research, directing my attention to the seemingly banal but nonetheless critical importance of things like ticketing and travel documents.

Within the extensive component of my participant observation, I traveled the wide territory of the Chinese rail system as far east as Mudanjiang, near the North Korean border, and as far west as Khorgos, on the border with Kazakhstan. I took the train across the ferry to Hainan Island in the South China Sea, and traveled north to Manzhouli, on the Russian border. Routes were chosen to span not just the territorial reach of the rail network but to reflect the internal heterogeneity of the rail system: I rode in carriages ranging from the luxurious business class on the new-built HSR trains, slippers included, to an old diesel train in Dongbei, without air-conditioning in the summer heat. I traveled through the bustling, commercialized waiting room of Shanghai's Hongqiao station and the just-built, nigh-uninhabited spaces of Kunming South Station; I sat in the quiet of waiting rooms in third-tier stations in the center of the North China Plain and on the Tibetan plateau. During these travels, I gathered data on how station spaces differed

between regions, and between core and peripheries, in terms of security practices, ticketing, and how the flows of passengers were regulated. I also looked for patterns in how passengers prepared for travel, what sorts of things they brought with them for sustenance and entertainment, and how they passed time during the rail journey.

I also selected a handful of routes to ride repeatedly to gain a deeper sense of how rail spaces varied over time. These routes, between Guangzhou and Shenzhen, Shanghai and Nanjing, and Beijing and Tianjin are all heavily traveled commuter routes between major urban centers. During these journeys, I attended to how familiarity separated these individual stations out from the normal, and how I began to adapt new practices and routines geared to the specificities of these places. I observed how stations are materially reconfigured, through the use of barriers, as passenger flows fluxed over days and months.

Rail space is a social environment blurs covert and overt participation in complicating ways. Despite its occasionally intense intimacy, it is also largely depersonalized and depersonalizing. While I immediately disclosed my status as a research to anyone who inquired or with whom I spoke, that seldom occurred, and I was therefore at most times passing as a regular, albeit foreign passenger.

I collected data during the ethnographic components in the form of field notes documenting observations regarding what I did, the sensations and emotions of rail travel, my process of learning new practices through observation and experimentation, as well as what I observed of the practices of others. I documented the discursive and material environments of stations and carriages by taking photographs; I took short video recordings to capture the sounds and movements that characterize the experience of rail

travel. Visual methods have had a fraught history within ethnography and geography: under the scientific-realist paradigm, they were seen as an objective method of documenting visible "realities" (Crang 2003, 500). The radical rethinking of ethnography after the cultural turn critiqued the masculinist, colonial "scopic regime" in which images capture a feminized, exoticized other (Pink 2013; Rose 2011). Affective methodologies engage the researcher's situated embodiment to avoid falling into the God-trick of the gaze from nowhere (Haraway 1988); but arguably fall into an alternate mistake of assuming that, in particular, video is both necessary and sufficient for capturing the flow of practice (Dewsbury 2010). Accordingly, visual documentation served two purposes in this project: first, it served to record my own process of "learning to see" rail space as a passenger (Grasseni 2008). Second, photographs and videos documented the visible dimensions of the spaces and things which constitute the more-than-human assemblage of rail space: this data contributed to the analysis of findings and also constitutes, within this dissertation, a way to present those findings.

The understanding I developed through observation of other passengers and first-hand experience of the practices of rail travel during my journeys, formed the basis for my semi-structured interviews. These interviews served multiple purposes. Firstly, they functioned as a form of validation, allowing me to compare my interpretations of rail practices and social distinctions against those of insiders. Secondly, interviewing passengers from a range of different ages, genders, classes, and home regions (i.e. core or peripheral to network) allowed me to situate the findings from the participatory observation, identifying similarities and dissimilarities between my first-hand experience of rail space and the experiences of others. Lastly, it allowed me to gather data on the

longitudinal evolution of rail space: I was particularly interested to interview older passengers in order to incorporate passenger's perspective on how the practices of rail travel have changed over time. Interviews questions addressed topics such as initial rail travel experiences and subsequent development of traveling practices and understandings, as well as eliciting perspectives on how the system has changed over the time. The interviews asked about shifting perceptions of space, their understandings of the ease or difficulties of rail travel, and how rail travel fit into their everyday life. Understanding how rail travels relies on and instills certain practices and skills illustrates the role rail plays in the production of nation-ness at an everyday level, allowing me to grasp how the experience of railway travel generates "bottom up" understandings of national territory.

This data documents the mechanisms that knit the system together: the standardization (or lack thereof) of station and carriage layouts; how passengers put the affordances of rail infrastructure to work in both permitted and illicit ways; how discursive representations of the network are embedded within rail spaces; how passengers and spaces are managed by railway personnel, and how passengers navigate through and subsist within rail spaces. This data allowed me to establish how practices dispersed through and within the rail system help produce nation-ness as well, linking a community of practice with an infrastructural landscape. In addition to looking for standards and commonalities, I documented class- and gender-inflected differences in practices, as well as variation across regions. These observations provided concrete evidence of how rail spaces reproduce and also generate tensions within the emergent nation.

3.1. Phase One Data Collection and Analysis

The data for the first phase of this dissertation research was collected over seven months of fieldwork conducted in China. I operated out of Guangzhou for five and half months from the fall of 2016 to the spring of 2017, and then out of Beijing for six weeks in the fall of 2017. Data from the participant observation was collected in the form of written field notes, digital photographs and videos. I wrote more than 60,000 words of field notes and recorded over 12,000 photographs and videos. Initial "jottings" were taken as close to the time of observation as possible, usually typed on my laptop computer while waiting in stations or sitting on trains (Emerson, Fretz, and Shaw 1995). During longer periods of downtime, or after returning from a journey, I went through the notes a second time, fleshing out brief sketches and adding detail to partial scenes. I collected ethnographic data during journeys of one to six days, during which I would take multiple trains, often purchasing overnight sleeper tickets in lieu of a hostel room. I spent more time on HSR trains than conventional, in part simply to cover more ground and reach distant regions of the network.

I conducted twenty interviews with rail passengers, in Mandarin Chinese and recorded digitally. The majority of the respondents were recruited through snowball sampling relying on friends and professional contacts, with a minority recruited while traveling on the train. While I initially anticipated that I would be able to recruit respondents and conduct interviews with fellow travelers during the trip, I found this unfeasible. Ethically, the lack of privacy made it difficult to ensure confidentiality, and the background noise made both listening and recording challenging. Most centrally, however, I discovered that depictions in texts and popular media of extremely sociable

atmospheres on Chinese carriages have become outdated: during my fieldwork most passengers—nearly all passengers, on HSR trains—spend most of the journey in silence, interacting with their smartphones. The respondents I did succeed in recruiting onboard were on the slower trains on longer routes, where boredom, lack of electricity, and—my findings suggest—a different assumption of sociability pushed passengers toward conversation. I interviewed travelers of a range of ages and roughly equal numbers of men and women (see Table 3.1). Interviews lasted between thirty-two and eighty minutes, with an average length of fifty-two minutes. Most interviews took place in either Guangzhou or Beijing, often in homes and sometimes in cafes. The most common home provinces among respondents were Guangdong and Shanxi. The concentration of respondents from Guangzhou is easily explainable as that was where I was based for the bulk of my fieldwork. Most but not all of the Shanxi respondents were recruited through the same social network. Interviews were transcribed into written Chinese by native-speaker research assistants; all English translations in this dissertation are the author's.

Age range:	Men	Women	Totals
20s	1	5	6
30s	3	2	5
40s	2	1	3
50s	1	1	2
60s	2	2	4
Totals	9	11	20

Table 3.1. Age and gender breakdown among the interview participants.

I analyzed fieldwork data during the summer of 2017 and the following winter. Following ethnographic practice, I processed my "raw" data into a "cooked" form through an iterative process of reflection and coding (LeCompte and Schensul 1999). I

used ATLAS.ti qualitative data software to code fieldnotes and interview transcripts. I coded the Chinese-language transcripts directly, listening to the recordings as I worked to ensure that nuances of intonation and expression were not lost. For the purposes of this dissertation, I used visual data to contextualize field notes and transcripts, offering complementary strands of representation (Pink 2013).

While coding I looked out for differences within the data as much as for commonality: in particular I attended to variations between different regions, illustrating the differential impact of rail development, and variations between different types of carriages and how stations serve different riderships, illustrating how rail produces its own internal heterogeneity. Given the strong theoretical core of this project, I anticipated using "top-down" coding to draw out patterns in the data related to the project's research questions. This turned out to be true only to a limited extent. Code families related to representations of the rail system and Chinese territory that were embedded in the rail environs were less evident in rail space than I had anticipated: I only rarely encountered maps or other visual representations of the system as a whole. In a similar vein, an anticipated code family on understandings of national territory found little application: senses of nation-ness were articulated within a narrative of progress far more than as a transformation of space.

On the other hand, code families concerning the routinized practices of rail space, relating to behaviors, travel strategies, and the physical and emotional character of rail travel proved to be a rich vein of analysis. How travelers perceived other travelers and rail space highlighted the entanglement of hygiene, education, and social class; these findings contributed to the article presented here in Chapter VII. Additionally, over the

course of my fieldwork I identified several key objects which served to articulate the practices and perceptions of rail passengers into the built environment of the rail system. Codes collating data on *standardizations* of practice and environment documented how behaviors and spaces are rendered generic across geographic and chronological distance; these contributed to the analysis of water infrastructure in Chapter VI and the analysis of ticketing and securitization in Chapter VIII.

3.2. Phase Two Data Collection and Analysis

For the second phase of this dissertation research, I assembled a body of texts concerning the Express Railway Link (XRL) between Guangzhou and Hong Kong. Long anticipated in the Pearl River Delta region, the XRL extends the rail network beyond what is a practical if not a formal boundary of the Chinese mainland state. This makes it a fascinating site to examine the entanglement of national communities and rail infrastructure. The XRL was under construction during my fieldwork, but was not completed until September of 2018. In order to examine how the practices, things, and infrastructures I studied during my fieldwork functioned along this unique and novel stretch of track, I assembled a body of texts from articles appearing in three mainland papers. In analyzing these texts, I focused on how the XRL and its accompanying travel documents and border control infrastructures were narrated through the distinct scalar imaginaries of the Pearl River Delta region and the Chinese nation. To draw out distinctions between these scales, I looked at two regional papers and one national paper. The *Southern Metropolitan* gained considerable renown in the early 2000s due to its daring reporting on mainland political scandals. Its sister paper in the Nanfang Media Group the *Southern Daily* is relatively staid, functioning as the official paper of the

Guangdong Communist Party. The *People's Daily* is the official paper of the national Communist Party, and has been the paper of public record since the formation of the People's Republic of China.

I assembled the texts for analysis using publicly available online databases through the newspapers' respective online portals. I used the Google search engine to sweep these databases for articles that included the Chinese terms listed in Table 3.2. I discarded articles that only mentioned the search term in passing, in reference to a different project, or duplicated other articles; this resulted a body of texts consisting of 103 articles, including 49 from the *Southern Metropolitan*, 16 from the *Southern Daily*, and 21 from the *People's Daily*. Additionally, I included 17 Chinese language news articles I came across during my research, from outlets including the BBC, the China News Service, and Xinhua, as well as Guangdong regional papers like the *Guangzhou Daily* and *Xinkuai Bao*. This body of texts is listed in Appendix A. English language articles from publishers like the *South China Morning Post* and *Hong Kong Free Press* were also collected during this period, and are consulted for context when appropriate. A proposed search of China Railway Yearbooks, an official publication of China Railway Corporation, for references to XRL, was planned to examine how China Railway narrated its own involvement in the XRL project. These yearbooks are searchable via the China National Knowledge Infrastructure website (cnki.net). However, I found that that the XRL was not mentioned with sufficient regularity and not in sufficient detail to conduct a substantive analysis.

Chinese term	English equivalent
（粤港澳）大湾区	(Canton-Hong Kong-Macau) Greater Bay Area
（京）广深港高铁	(Beijing-) Guangzhou-Shenzhen-Hong Kong HSR (XRL)
一地两检	Joint checkpoint ("one place, two inspections")
通行证	Travel Permit (generic term for cross-boundary passes)
回乡证	Home Return Permit
港澳居民来往内地通行证	Mainland Travel Permit for Hong Kong and Macao Residents (MTP)
双程证	Two Way Permit
往来港澳通行证	Exit-Entry Permit for Travelling to and from Hong Kong and Macau
一小时生活圈	One Hour Life Circle
珠江三角洲经济区	Pearl River Delta Economic Zone
泛珠江三角洲	Greater Pearl River Delta

Table 3.2. Search terms for newspaper archives concerning the XRL.

I used this body of texts to conduct an analysis of how the XRL discursively and infrastructurally realizes regional and scalar imaginaries. I conducted the analysis in Atlas.ti. First I used these articles to build a timeline of the XRL project over the two decades since its conception. I found that the migration infrastructure of passport-like travel permits and customs procedures was discusses side by side issues of ticketing and accessibility; I also synthesized a timeline of how these objects have developed over time. I then conducted an analysis of the discursive deployment of the XRL: on whom, and on whose behalf, is the XRL intended to work? What are its impacts imagined to be, and what spatial extent is it imagined to effect? This analysis shows that the XRL has become part of the Greater Bay Area, an imaginary of the Pearl River Delta that subsumes Hong Kong into the region and therefore into the nation. However, the regional

and national media interpret it in tellingly different ways: within the region, the XRL is part of everyday life, while from Beijing it is understood in the context of the nation-covering HSR network. These findings are presented in Chapter V.

CHAPTER IV

NAVIGATING RAIL SPACE

1. Introduction

Investigating rail infrastructure as a heterogeneous assemblage composed of both human and non-human, material and discursive, social and technological elements is easier said than done. In this chapter I describe rail space as it comes to be known through the unremarkable practice of rail travel. While China's rail system is a powerful symbol, I argue its potency is not in the ways it remains discursively salient, but the ways that it works unobtrusively to weave a set of practices and things into conceptions of identity and place. While these processes are not unique to rail space, it is nonetheless an illuminating site to examine how practices produce identities, and things and infrastructures produce place.

The account of rail space given here adopts the passenger's perspective. Passengers are not the only community of practice within rail space: the work of cleaning crews, public security officers, ticket agents, stewards, architects and designers all have a hand in animating the rail assemblage. Passengers, however, are the largest community within rail space, and the most transient: which is to say, their relation to rail is not as topic, but as infrastructure (Star 1999, 380). For these reasons, understandings of rail space among passengers are the most relevant perspectives for examining the questions concerning national identity and place that are at the heart of my research. My methodology reflects this: my fieldwork aimed to capture the passenger perspective.

This perspective also serves to structure this chapter. I trace the coming together of practices and things through which rail travel becomes a reality, beginning from the

moment the journey is first imagined to the final destination. At its core, the function of rail infrastructure is to move bodies though space; rail travel is therefore an essentially corporeal endeavor. From the passenger perspective, rail travel has little to do with rails and a great deal to do with walking, sitting, and standing. Yet bodies are only one of the many things which passengers must coordinate in order to navigate their journey. Rail space is animated as much by flows of tickets, luggage, water bottles, trash and even air as by the flows of bodies. My fieldwork found that some things played a pivotal role in assembling the bodies of passengers and the environs of rail space into a functioning whole. By "pivotal" I mean that, like a pivot, they fix a relation between two things along some but not all axes. In this chapter, I examine how tickets, smartphones, and water bottles relate the bodies of passengers to rail infrastructure as well as within broader societal debates about class and proper behavior. I attend to matter in order to examine how it is suffused with meaning. Bodies in motion are in constant dialogue with one another: moving to avoid collisions, to defend space, to invite conversation or refuse it. Matter's capacity to affect other matter encompasses its tangible properties and its subtler dimensions. How people move, and what they move with, communicates emotion—whether they are rushed, excited, anxious, comfortable, bored, amused, angry or eager—as well as their relation to larger systems of meaning such as gender, class and nation. One way in which matter comes to signify is to be inscribed with discursive symbols: rail space is rich with discourse telling passengers how to behave, what to buy and what sort of citizen to be. How these discourses are juxtaposed and distributed through space sheds further light on the emergent contours of Chinese nation-ness.

I pay particular attention to the tension between coherence and fracture within these processes. The coherence of rail space is contingent. Rail space is composed of *nodes*: each individual element of rail infrastructure must share a degree of commonality in order to function within the network. That the stations and carriages within the Chinese rail system do, in fact, constitute a compatible and coherent whole across its vast extent is easy to take for granted. Whether in the standardization of passenger identification, the design of automated ticketing gates, or universal provision of human necessities, coherence is the outcome of a massive and unending feat of coordination. This ethnography aims to excavate the tremendous effort, by passengers as well as personnel, that goes into producing and maintaining rail space as a co-functioning whole.

Yet against this coherence are patterns of fracture across space and within communities of passengers. While Chinese rail space is remarkably standardized in terms of passenger practices and spatial organization, my research also examines how hierarchies of difference are produced within rail space. This chapter also examines how the practices and tools of rail travel vary between passengers, and how these practices enable or constrain their movement through different parts of rail space. I found two overarching patterns of fracture. The first was between high-speed passenger-dedicated rail (HSR) network and the pre-existing conventional network. I found that the spaces, things, and even bodies of high-speed stations and carriages constituted a distinct, albeit not wholly separate, assemblage. This bifurcation of rail space reproduces and therefore deepens well-known tensions in Chinese society writ large between urban and rural, wealthy and poor, young and old.

Other fractures emerge from the topological character of rail space. The standardizing logic of nodes is in tension with the emergent properties of networks: along any single line, some stations are more central than others; as lines join into networks, a hierarchy between core and periphery emerges. As the system grows in size, the disparity between center and periphery tends to steepen. As a consequence of the topological quality, regional differences of the sort that long dominated Chinese geography—north versus south, coast versus inland—explain less about the character of any given station than its position within the network. Hubs, whether in Xining or Beijing, and mid-line stations, whether in Guizhou or Hebei, have many of the same characteristics. In this chapter, I describe the differences between stations in terms of their topological position, rather than in terms of their geographic region.

1.1. Affordance & Tolerance

In recounting how bodies, things and environments interact to produce rail space as a functional assemblage, it is easy to recount it as a sort of "just so" narrative: all of these elements relate in the way that they do because that is the way they must interact in order to produce rail space. Such an account eliminates both agency and contingency: passengers and personnel are reduced to automatons, and it becomes difficult to imagine how rail space could be otherwise. Yet as I encountered time and again in my fieldwork, passengers are constantly innovating, developing new ways of using the spaces in which they find themselves—often in flagrant disregard for how the spaces are designed to be used. Constantly monitoring these emergent uses, the role of designers and on-the-ground personnel are felt indirectly, through the shifting contours of rail space which constrain passengers' practices away from those which threaten the system's smooth function and

toward those that reduce friction. To capture how this dynamic plays out through the material forms of rail space, I draw on the conceptual pair of *affordance* and *tolerance*.

The concept of affordance, emerged in the field of ecological psychology in order to center a relational account of the qualities of things (Gibson 1979). Rejecting classical philosophy's descriptions of the nature of things in terms of objective qualia such as color, weight, and so forth that a detached observer might note, Gibson argues that things are perceived through practical interaction, disclosing their qualities in relation to the particular activities in which the participant is engaged. Social scientists have employed this relational account to explore the constitution of social space not through the narrations of its architects and designers, but through the experiences of those who dwell within them. Affordances are not determined in advance through fiat or design, but are emergent relations between the object and the user (Ingold 2002, 166–68): while a chair might "be for" sitting in, it equally affords the potential use of footrest, pillow fort infrastructure, firewood, tiger-taming implement, and so on. What affordances a thing or an environment discloses is shaped not just by "objective" physical qualities but is historically and culturally situated as well, passed down through generations of users (Ingold 2002, 186). The concept of affordance helps us conceptualize how different users turn rail space to their own ends: barriers become impromptu resting spots, and waiting rooms become captive markets for media and commerce.

Figure 4.1. Passengers have found that traffic barriers in front of the ticket office at Guangzhou South Station afford a comfortable place to sit.

If affordance emphasizes open-ended potentiality within socio-technical assemblages, *tolerance* examines the point at which that potential meets a hard limit. Tolerance defines the divide between acceptable and dysfunctional. Tolerance, in the engineering sense, is the permissible limit or limits of variation materials may have in dimensions, properties, or conditions without significantly affecting the function of the structure which they constitute. In rail space, tolerance governs how different elements of the system—track and wheel, carriage and tunnel, passenger and gate—come together, defining what variations, what range of inputs each can tolerate from the other. Tolerance does not rule out the contingency that more variation *could* occur; tolerance only identifies the point beyond which the assemblage can no longer function and begins to

break apart, no longer forming a whole. While investigating the rail system, I found that the technical conception of tolerance blurs into the social: new technologies depend on new methods for governing passengers and instilling new practices to realize their potential, and vice versa. I therefore employ the concept of tolerance to emphasize the mutual constitution of the social standards of mobility, legibility and self-discipline which govern the movement of human bodies and the technical standards which govern the movement of machines. In this chapter, the blurring of the social and the technical is generally reflected in the offloading of ticketing and navigation duties to the passenger, but is particularly evident at the station gate and on the boarding platform.

The implementation of more demanding technical tolerances goes hand-in-hand with more demanding human discipline. It is through enforcing tolerances—excluding the intolerable—that boundary infrastructure maintains itself as a functioning sociotechnical system. Examining the Chinese rail system through the dual lens of affordance and tolerance shows a system in the midst of dramatic transformation. Technological innovation and social development produce more precisely machined human and non-human components, allowing for narrower tolerances: higher speeds, decreased friction, tighter schedules, smoother flows and decreased overhead. The opaque and shortage-prone paper ticketing system afforded scalpers with a method for capturing monopoly profits; as the ticket buying situation became increasingly intolerable for passengers, system managers were compelled to introduce a new ticketing system that did not offer such an affordance. The proliferation of smartphones affords passengers a new way to pass the journey at the same time that it provides China Railway a new, low-labor avenue to sell tickets. In the account that follows, I use trace how the particular

discursive-material, socio-technological assemblage of Chinese rail space emerges out of the relations between bodies, things, and spaces.

The sociotechnical assemblage of Chinese rail is difficult to parse: the bodily practices, things and spaces interlock in a multitude of ways that resist sorting out. To provide an overarching structure to my account of Chinese rail in this chapter, I borrow inspiration from the work of Tim Ingold. Ingold, in his influential account of skilled practice, analogizes practice to a journey, characterized by the four stages of getting ready, setting out, carrying on, and finishing off (2011, 51–62). In examining rail travel as a skilled practice, I take these stages more literally: I describe each aspect of rail space in the order that they are encountered by a traveler making their way through the system. Some things, like tickets and smartphones, make repeated appearances, revealing different affordances at each stage of the journey.

I build on Ingold's four stage account of skilled practice by examining an implicit fifth stage: the dormant period after the end of one journey and before the beginning of the next. I argue that this fallow period is particularly important to understanding how skilled practice contributes to the formation of identity. Edensor (2002) suggests that habituation to a particular material culture, a grounded and habitual understanding of familiar objects, is a central element of national identity. I argue the skillful practice of rail travel constitutes such a material culture: it shapes national identity and, because it relates to an infrastructural network standardized across China, it plays a particularly vital role in shaping national understandings of place. The skills of rail travel put all of China—or at least enough of China—ready to hand.

2. Getting Ready

As Laura Watts (2008) observes, rail journeys begin with an act of imagination—of imagining a destination with sufficient clarity that plans can be made. Yet this imagining is "not purely the imaginary work of a Kantian mind" but an embodied and practical act of cognition realized through the social and material work of purchasing tickets and packing bags (Watts 2008, 713). Purchasing tickets, that initial concrete first towards travel, has long been fraught and difficult to access in China. As late as 2011, prospective passengers had to make an initial journey to the station days or weeks in advance to purchase rail tickets, or if not the departure station itself, then to local ticketing agency. Ticketing agencies were a more recent innovation. Recounting their experiences in the nineties and earlier, older respondents told many stories of their trials and travails attempting to purchase tickets: showing up before dawn to join massive crowds in cacophonous ticket offices, waiting in line for hours only to find the route sold out. Prior to the advent of a centralized computer system in the late nineties (Bullock, Sondhi, and Amos 2009, 54), ticket accessibility was a constant uncertainty: tickets were physically allocated to individual stations, and only put on sale five days before the date of travel (W. Wang and Yuan 2018). Each ticket window served a different line or geographic area, with the corresponding tickets physically on-hand in cabinets filled with tiny drawers. During peak travel times like Spring Festival, passengers had to line up the night before tickets went on sale to have a hope of getting a ticket before they sold out.

The anxiety and uncertainty of getting ahold of a ticket fed the rise of ticket scalping. *Huangniu* (黄牛), or ticket scalpers, were a recurring figure in discussions of ticketing. These speculators buy up tickets in bulk to resell at a profit, often taking

advantage of inside connections at the station. The physical nature of rail tickets afforded this opportunity: prior to the introduction of the real name system in the early 2010s, tickets weren't linked to individual passengers. Scalping did afford some options to travelers: buying from scalpers meant, at the least, saving time otherwise spent waiting in line. During Spring Festival, when returning migrant workers and university students flooded into stations, filling every train to capacity for weeks on end, gangs of ambitious *huangniu* might buy up the tickets for an entire service, forcing passengers to pay exorbitant prices to get home.

The design of ticket offices reflects the massive flows of passengers which they must accommodate. While part of the station, ticket offices typically have separate entrances. After getting a ticket, passengers must exit and re-enter elsewhere: there is no assumption that passengers will flow directly from ticket office to platform. In front of the ticket windows—sometimes twenty or thirty in a row—passengers often find a series of permanent metal barriers set up to physically structure the flow of passengers (Figure 4.2). Some ticket offices have turnstiles installed to prevent more than one—or two, if they are slender—passengers to push up against the window, holding space for the passenger holding their ticket to escape. In other ticket offices, metal barriers are replaced with lines on the floor, sometimes scuffed to illegibility, marking out the placement of queues (see Figure 4.3). At first glance, these barriers appear to operate via separate mechanisms: metal railings materially constrain the movement of bodies, while painted lines are purely discursive prohibitions. Yet both depend on materiality and discursivity to accomplish their effects: metal barriers convey meaning beyond and prior to collision, and a painted line that has been worn away prohibits nothing.

Figure 4.2. In the ticket office at Hengyang Station, metal barriers and turnstiles communicate order.

Figure 4.3. In Sanya Station, some passengers wait behind the yellow lines; others do not.

These barriers affect passengers' usage of the ticket office, articulating into the material form of the space the intention of system managers, in a manner akin to how speed bumps articulate the intentions of traffic police. Latour describes "sleeping policemen"—as speed bumps are known in French—as translating from one discourse to another by moving from one material form to another (1999, 185–90). Yet what passengers do with these barriers is affected, not determined, by their designer's intention. The reliability of the queue comes down to the decisions of the people in line—both how far some are willing to push, and also how far others are willing to push back. When I began my fieldwork, and was slow to present my identification and name my destination, experienced and impatient passengers behind me would simply step past me as I hesitated. As I came to be more fluent in the rapid juggling of objects and words the ticket office demanded, I also learned how to defend my place in line. Other passengers I observed pushed the limits of the services offered by ticket offices further: some would bypass the line altogether, walking up the exit aisle to ask rapid questions of the teller between ticket sales.

When I began my fieldwork in the fall of 2016, the stations I travelled through had multiple ticket offices, but less than half were open at all, and only a handful of windows operating in each. It wasn't until January, the beginning of Chunyun that I saw ticket offices in full swing, Chunyun (春运, literally "Spring Move") is the forty day period around Spring Festival, the most significant holiday of the Chinese calendar. Chunyun is often described as the world's largest human migration, as families scattered across the country by migrant labor, urbanization and education re-unite to celebrate the New Year. Chunyun taxes China's transportation network to the limit, and the rail system

bears much of the burden. In 2017, over 357 million train trips were made during Spring Festival. During 2017 Chunyun, I finally saw ticket offices with agents behind every available window.

The 2017 Chunyun was the sixth Spring Festival since China Railway's catastrophic national rollout of 12306.cn, its brand-new, three-hundred million RMB online ticketing system. In 2012, online ticketing debuted to near-universal condemnation: the website was "harder to land on than the Diaoyu islands" in the words of one online critic (Wertime 2012). Long wait times, unreliable connections, and countless other inexplicable errors somehow combined to make waiting in line at crowded ticket offices a preferable option for many passengers. Yet despite its inauspicious beginnings, online ticket purchasing has become the norm: in 2017, more than 70 percent of tickets were purchased online (*Xinhua Net* 2017a).

The once obligatory passage through the ticket office has been partially circumvented: after arriving at the station, passengers can now go to automated machines for fetching and purchasing tickets (see Figure 4.4). With only a handful of exceptions,[‡‡] the automated machines rely on a single form of identification: the second generation *shenfenzheng* (身份证) or national identity card. While a number of other forms of identification, including foreign passports and more obscure forms of domestic identification can be used to create accounts on 12306.cn and to purchase tickets virtually, with these forms of identification passengers must still go to a ticket office and wait in line to get the actual ticket. The shift to online ticketing is reflected in the shifting

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[‡‡] In 2016, automated ticketing machines in Dongguan accepted passports alongside *shenfenzheng*.

terminology of station signage: some ticket offices are described as the *rengong* (人工), or "human operated" ticket office, for those passengers in need of a live agent for purchases, exchanges or refunds. Automated service is rapidly becoming the unmarked normal, with human-operated ticketing requiring explicit marking.

Usage of online ticketing and automated machines varies across space, but less along regional lines than across the rails systems' topology. At major hubs in large urban areas like Guangzhou and Beijing, automated machines are widely used. In stations serving HSR routes, ticket offices are relatively empty, serving only those who cannot use automated processes. In addition to those who need to return or exchange tickets, these offices serve passengers who lack second generation *shenfenzheng*. Many of these passengers are not attempting to buy tickets on the basis of hukou booklets, passports or other acceptable forms of identification, but those who simply lost or forgot to bring their *shenfenzheng*. These passengers must go to the public security booth typically set up in or near the ticket office (often taking over an unused ticket window) with a photo and their *shenfenzheng* number to receive a temporary identification that will allow them to buy a ticket that day only. At smaller stations, especially mid-line stations along non-HSR routes, there might be no automated machines at all, issuing all tickets through an agent (see Figure 4.5).

Figure 4.4. Automatic ticketing machines, with detailed, step-by-step instructions in Uighur, Chinese, and English. Urumqi Station.

Figure 4.5. The ticket window and security check at Miyun North Station, just outside Beijing, serves only conventional trains and relies on "human-operated" ticketing.

Uptake of the machines by passengers and stations is uneven demographically as well as geographically. Most passengers access China Railway's online ticketing service from a smartphone, using the official 12306 app or more commonly, a third-party app such as Ctrip (*Xiecheng*, 携程) or using what's called a WeChat "small app." Ctrip, now Trip.com, is one of the world's largest online travel agencies, and made international news with its purchase of UK-based Skyscanner for $1.7 billion (*Bloomberg* 2016). This shift has put the ticket office into the hands of passengers wherever they may be, whether in bed at home or on the subway to the train station: all of China has become the ticket office. Yet while it may appear the ticket office has melted into air, the obligatory passage point has not vanished, only transformed. By attaching tickets to individual via state issued identification[§§], online ticketing has shut out a Chinese passengers whose their births were never registered under China's strict family planning system (Thomson Reuters Foundation 2016; Shuzhuo Li, Zhang, and Feldman 2010).

Moreover, the technological assemblage of online ticketing, state identification, and smartphone requires its own set of skills to navigate. For older or less educated passengers using a smartphone or automated ticket machine is not second nature, imposing new barriers for those who lack digital or written literacy (Huo and Wei 2013). Discussing online ticketing with my older interviewees, I noticed that while they would sing the praises of the convenience of online ticketing, they were often rather vague about the details. Then, in one interview, my respondent admitted he did not himself use the app: he had his daughter buy tickets for him, using his information using her app. This

[§§] For an in-depth examination of the relationship between rail travel and state identification see Chapter VIII.

was not a unique situation: I discovered that many younger people, particularly women, played the role of de facto ticket agent for their older relations, re-intermediating the process supposedly disintermediated by computerization. For technologically savvy, state legible travelers, the advent of online ticketing has created a seamless, unhindered passenger experience; for others it has restructured the passenger experience beyond recognition, rendering old skills useless and imposing new kinds of friction.

3. Setting Out

3.1. Packing

If purchasing a ticket has become (for some) effortlessly convenient, putting any city in China only a few taps away, packing remains firmly embedded in the material realm. Traveling requires detaching oneself from one's usual living environment: all of the everyday practices that people depend upon to meet their needs are shorn of the context upon which they depend. In becoming passengers, people must rethink how they will feed themselves, stay hydrated, stay comfortable, and stay sane during their journey and after arriving at their destination. Packing serves as a microcosm of rail travel's entanglement of imagination and reality, skill and culture. Packing is an act of skillful anticipation: one must cast oneself forward through time to imagine and prepare for future challenges. Yet it is an act of imagination anchored in a particular social and experiential context: what passengers imagine of their journey and their destination is situated within personal experience, second-hand knowledge and media portrayals of the challenges they may face and the affordances of which they might avail themselves. Moreover, packing is itself anchored in the material reality of the things—the clothes, the snacks, the books or laptops—which are assembled into the particular form of luggage.

Packing is an act of embodied cognition, skillful work situated in a particular social and material context.

Some passengers bring along snacks in anticipation of the journey: steamed buns, hard-boiled eggs, oranges or sunflower seeds; others wait until entering the station to buy KFC chicken or McDonald's burgers and fries to eat on board. Some passengers bring along insulated thermoses, knowing they can fill them at ubiquitous hot water taps; others prefer to buy bottled water, although the price is two to ten times the cost elsewhere. Passengers must anticipate how they will pass the time: some bring books, magazines, or if traveling in a group, a deck of cards. The prevalent form of entertainment, however, is the smartphone and its endless series of diversions—until the battery runs out. Some newer stations and HSR carriages have outlets or recharging stations, but not reliably and passengers often carry an external battery for recharging during the trip. Each of these decisions is materially made, as one holds a cup of noodles or a book, weighing it against future need and anticipated affordances.

Consequently, how passengers pack is socially and culturally laden. These decisions made carry through the journey in the form of luggage. As Bissel (2009b) observes, different "body-technology assemblages" produce distinct embodied experiences of travel. Yet the practical knowledges of how to maneuver through rail space are differentiated not just by considerations of encumbrance and bodily capacity, nor by the particular constraints of any given journey; they are shaped by cultural difference as well.

3.2. The Luggage-Body Assemblage

Luggage plays a visible role in the mutual entanglement of passengers and rail space, its material and discursive properties continuing to play a constitutive role in the practice of rail travel. Most viscerally, luggage is encumbrance. While officially limited to twenty kilograms on HSR trains and fifty kilograms on conventional trains, in practice weight restrictions are rarely enforced.[***] A public service announcement prevalent within rail space shows Santa boarding an HSR train with an outsized bag: the recommendation was not to travel with less, or ship some of it, but to split it into two smaller bags. Some passengers take full advantage of this leeway, traveling with two or three sizeable pieces of luggage; other ignore size restriction entirely. Traveling under such a load requires both skill and fortitude, and occasional assistance. Rail tracks are by necessity straight lines, forcing flows of passengers up and down as they make their way through rail space. In newer stations, escalators complement flights of stairs—unless they break down. Boarding a train from Shenzhen to Guangzhou, the flow of passengers slowed to a crawl at the stairs up to the platform: the escalator was out of order, forcing the boarding and the disembarking passengers share the narrow stairwell (Figure 4.6). In front of me, an old man was pulling a huge wheeled cart of luggage; another passenger tapped his shoulder, and wordlessly indicated the pile of luggage. The old man nodded assent and the other man grabbed the bottom of the cart and the two carried the load up to the platform, where they parted ways once again.

[***] That these luggage restrictions were actually enforced along the Express Railway Link between Guangzhou and Hong Kong caught some passengers off guard and caused some resentment when it first opened in 2018 (Tsang, Yau, and Sum 2018).

Figure 4.6. A broken escalator forces passengers in Shenzhen Station to navigate the kinds of cross-current flow that rail space is designed to avoid.

Hard-sided rolling bags are a common sight: wheeled luggage allows passengers to take advantage of the affordance offered by the smooth surfaces of railway stations, platforms and carriages, and hard smooth sides make for fluid maneuvering of luggage through x-ray machines and into luggage racks. Many passengers adopt the practice of tying a plastic bag of snacks—oranges, nuts, or instant noodles to the handle at the top of the roller bag (Figure 4.7). After seeing dozens of bags arranged like this during my fieldwork, I decided to give it a try myself: on the metro on the way to the train station, a fellow passenger was so surprised to see it that she started a conversation to ask if I was taking the train. While from one perspective wholly pragmatic, this practice is also encoded as characteristic specifically of Chinese rail travel.

Figure 4.7. A stereotypically "Chinese" body-technology assemblage of passenger with hard-sided wheeled luggage with plastic bag of snacks on top.

Passengers travel for a range of reasons, entailing a different load. On the lighter end, some passengers are making a day trip to a nearby location, for work or leisure.

They carry only a suitcase, a purse or a light backpack. On the heavier end, there are entire households making a move via rail, carrying everything from bedding to mops. The most archetypically encumbered passengers are migrant workers (农民工 *nongmingong*) whose mobility has been the lynchpin of China's economic boom. Moving between their homes in poor rural areas in the interior to industrial areas up and down the coast, migrant workers are frequent and expert users of the rail system. As terms like "the floating population" (流动人口 *liudong renkou*) indicate, their identity is defined in terms of constant circulation; as Crang and Zhang describe, they "dwell" in transit spaces, adrift between home and worksite (2012, 898). Drawing on the new genre of "hired laborers literature" (打工文学 *dagong wenxue*), Crang and Zhang show how the spaces of transit—first and foremost the rail system—are a key site of shared experience and identification for migrant workers, a population who otherwise remain firmly embedded within native place networks. Poems capture the bitterness of standing in line for hours during Chunyun or the challenge of carrying snakeskin bags (蛇皮袋 *shepi dai*) across the country on one's back (Crang and Zhang 2012, 905). "Snake skin bag" describes a particular type of woven plastic bag printed with a sort of plaid said to resemble the scales of a snake.[†††] Cheap, capacious and waterproof, they proved popular among migrant workers carrying a year's worth of necessities, and quickly became emblematic of the migrant worker rail passenger. As the poems analyzed by Crang and

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[†††] Outside of China, these bags have a long history as a marker of poverty and migration. They first achieved infamy in 1983 as "Ghana must go" bags: Ghanaian migrants were suddenly expelled from Nigeria, and the bags became synonymous with the resulting exodus (Ling 2018).

Zhang exemplify, these large and unwieldy bags come to constitute a body-technology assemblage distinctive to the migrant worker: a body awkwardly stooped under their weight, yes, but also a source of emotional and material support (see Figure 4.8).

The snakeskin bags, along with plastic buckets, repurposed rice sacks and other makeshift containers suggest how luggage functions as a powerful marker of social class within rail space. Laden migrant workers make a stark contrast with passengers traveling with Louis Vuitton handbags, yet often share the same carriages. Moving back and forth between HSR and conventional routes, there was no clear line demarcating one group of passengers from the other: only a tendency for the luggage of conventional rail passengers towards the make-shift while on HSR for luggage to be sleeker and smaller. In rail space, the distinction between luggage as encumbrance and luggage as social signifier becomes blurred: the very state of being encumbered, to have to labor to manage multiple bags across vast waiting rooms rather than wheel swiftly through is a mark of lesser status.

3.3. The Ticket

Tickets, as material objects, are pivotal for coordination between passengers, personnel and rail space. They are an entry permit, a reminder, a navigation aid and allow personnel to keep track of passengers' unidirectional flow through rail space. The axes along which they fix relations and along which they enable movement have shifted over time; the fixing of tickets to real names is only one example.

Chinese rail tickets are immediately distinguishable by color: not divided by type of ticket, or the class of ticket, or HSR versus conventional, the color difference instead indicates whether they have the magnetic encoding that allows them to be automatically

Figure 4.8. Passengers use snakeskin bags as impromptu seating in the ticket office of Guangzhou Station.

scanned by ticket gates or whether they must be visually verified by a ticket agent. The color difference is an important signal for passengers and personnel: gates to board and exit train platforms are divided into different channels for those with magnetized and not-magnetized tickets, typically indicated via signs and floor decals. Ensuring that passengers can guide themselves to the correct gate is essential to keeping the boarding process flowing.

This ticketing system in its current form is barely more than a decade old, and is already becoming obsolete. From the forties through 1997, Chinese rail tickets were narrow strips of cardboard, printed en masse and distributed to stations in lots, stored behind the ticket window in countless tiny drawers (W. Wang and Yuan 2018). In 1997 China Railway introduced the first "soft tickets", printed at the point of sale by a

computer connected to a central network. These tickets—and the system behind them—made ticketing considerably smoother but retained a problematic fixed quota distribution system (Bullock, Sondhi, and Amos 2009, 54; W. Wang and Yuan 2018). In 2008, the new Beijing-Tianjian high-speed railway line began to use the machine readable magnetically coded tickets—neatly distinguished by their blue color. When online ticketing was rolled out in 2011, both tickets got a redesign to include the name of the passenger as well as a QR code in place of a bar code. Now the Chinese rail network is poised to do away with paper tickets altogether: beginning in 2019, all HSR trains accept "e-tickets": bought online, these tickets allow passengers to enter stations and pass through gates using only their national identification card (Junwei Wang 2018).

The physical body of the ticket remains instrumental for both personnel and passengers. Entering stations, security agents mark tickets with a stamp or a pen stroke after checking it against identification. In Beijing South, this procedure is impossible to follow. Because the station was built with ticket offices inside the main waiting room, the only place it is possible to match identification with ticket is at the boarding gate. Here, station personnel fall back on an old rail technology: the ticket punch. At the gates to the inter-city commuter line to Tianjin, a station agent checks the ticket against the passenger's identification, and clips a distinctive shape into the edge of the paper ticket to prevent the ticket from being used again. Tickets also aid navigation for passengers as they move through rail space. In rail space, a multitude of signs (Figure 4.9), as well as a particularly adorable public service announcement starring a panda traveling alone (Figure 4.10), educate passengers how to use their ticket to locate their gate on station bulletin. The train, departure time, gate, and carriage number are neatly summarized on

the ticket, keeping this information ready at hand. The physical ticket comes into play once again when disembarking. Exiting the platform back to the station concourse, passengers pass through another check: automated gates for those with blue tickets and manned by station agents for those with red tickets. The automated gates mark used tickets with black lines; station agents clip or rip tickets to show they have been used.

The physicality of the ticket is also used to keep track of passengers and stops on overnight sleepers, where there is a concern passengers might sleep through their stop. The solution is quite elegant: shortly after the train starts moving, stewards go through each compartment, collecting the ticket from each passenger, placing it in a binder with a pocket corresponding to each berth, giving the passenger a berth marker in return (Figure 4.11). Before each stop, the steward can easily flip through the binder and see if any passengers need to disembark, locate them, and make sure they are awake and ready to go. Tickets render passengers more legible to rail space, and rail space more legible to passengers.

3.4. The Station Plaza

Rail space leaks beyond its own boundaries. Purchasing tickets, fetching them from ticket offices, packing luggage and buying comestibles: all this before even entering the rail station. The station plaza forms a vital mediating zone between the securitized interior of rail space and the surrounding environment. Station plazas serve multiple purposes: they are staging areas for travelers; markets for storefronts or hawkers selling food, drinks and last minute travel necessities like folding stools or external batteries for smartphones; space for station personnel to set up overflow waiting rooms and ticket offices during Chunyun; and de facto public parks. Station plazas are places for waiting,

Figure 4.9. Signs, such as this one in Chengdu East Station, educate passengers how to relate the information contained on their ticket to the physical layout of the station.

Figure 4.10. This short public service film shows the panda's confusion and shame transform into triumph and joy after he musters the courage to approach a station agent, who shows him how to read his ticket and relate it to the signs and symbols of rail space. The film plays on the very infrastructure it teaches passengers to read.

Figure 4.11. Binders, like this one on the overnight train between Kunming and Guiyang, allow stewards to track passengers as they board and disembark.

but are often aggressively empty of places to sit: any available seating is quickly occupied by passengers. How to turn these deliberately uncomfortable spaces into a place to spend hours waiting requires deploying a range of skills: passengers use their luggage or convenient barriers as seats, or place cardboard or newspaper on the ground (See Figure 4.12).

Figure 4.12. A group of men play cards in front of Zhengzhou Station, using luggage for seating and for a card table.

Public security is a visible presence in station plazas. In the form of uniformed officers on patrol, police stations with flashing lights, public security is rarely out of sight. Most of these officers are uniformed but unarmed, perhaps with riot control gear—shields, helmets, billy clubs and mancatchers—leaned against police vehicles or beside watch posts. At some stations, plazas are patrolled by squads of SWAT or military police

outfitted with bullet-proof vests and automatic weapons. Militarized levels of security were most visible at Kunming Station, which was the site of deadly attack in 2014.[‡‡‡] Yet other stations in the Chinese heartland such as Zhengzhou East Station and Tianjin Station also had highly armed security personnel stationed at visible points and patrolling around the station. While increasingly a site of intensive state control under the real name system and new security procedures, rail stations and rail travel retains a reputation as a site of chaos: stories of theft, scams, and violence are commonplace. As depicted in posters in Nanning, the presence of public security personnel helps to defend against terror attacks and prevent illegal border crossings in a form of security theatre not too distant from that of the post-9/11 United States (Figure 4.13).

Figure 4.13. At Nanning station, approximately 150 kilometers from the Vietnamese border, posters illustrate the role of police in defending against threats from outside China and from within.

[‡‡‡] This attack, its background and consequences are discussed at greater length in Chapter VIII.

3.5. Entering the Station

Ticket, identification, luggage—juggling the many parts of the body-technology assemblage constituting the rail passenger can be demanding, with little tolerance for error. At the entrance of the station, passengers must have ID and ticket in hand to pass to the ticket window agent, and then right after receiving them back, immediately stow them away safely in order to free their hands to load luggage into the x-ray machine and pass through the metal detector to the side. The rigor of this examination is typically quite low, prioritizing rapid thorough-put over meticulousness. These security checks commonly become a bottleneck in the flow of passengers through rail space, and both passengers and personnel work to keep things moving. Complications, such as multiple pieces of oddly shaped luggage or a misplaced identity card, can cause a pile up, a tangle of people and things suddenly not flowing as they ought. Passengers push past anyone too slow to get their luggage on the x-ray machine first, to cut ahead in the line through the metal detector. To regulate the flow of passengers through the security scans, some stations place an agent at a gate before the machines, to prevent the crush of waiting passengers from piling up right at the machine. Passengers push against these agents with a daring that initially shocked my sense of acceptability, acculturated as I am to the fearful respect for TSA in US airports.

The skill implicit in keeping these checks moving smoothly was forcefully brought home one night in Xi'an when in the process of reaching for my passport I somehow managed to pull my wedding ring off my finger and fling it under the security booth. I heard it bounce, but couldn't see where it had landed. I saw that the security booth, a new addition to the Xi'an station plaza, was set up off the ground. I tried to look

underneath the booth with the light of my smartphone, but saw nothing glint but one jiao coins. As I searched, I was acutely conscious of the line beginning to pile up behind me. In a cloud of anxiety, I decided to pass through, and see if my ring had rolled under the booth to the other side. To my infinite relief, it had: I saw my ring lying in plain sight, nearly under the feet of passengers walking into the station. The ability of station security to swiftly and smoothly move passengers through rail space is dependent on the skillful work by passengers to render themselves as safe, legible elements of the ridership of China's rail system—work made momentarily visible in my own failure. While the technological dimension of securitization, in the form of the real name system, is easier to identify, it functions only because passengers have learned how to accommodate less forgiving tolerances of the new regime.

3.6. Rail Space Media

These security procedures are relatively new to rail space, and educating passengers on how to produce themselves constitutes one of the main components of rail space's discursive environment. Yet the advent of the real name system is only one of countless shifts taking place as new infrastructure comes on line or falls into disrepair, and as new patterns of use emerge. Both passengers and personnel have to adapt to shifting relations between each other and their surrounding infrastructure: they must constantly re-learn how to inhabit rail space. To achieve this requires on the one hand a significant investment in rendering rail spaces legible, and, on the other, requires from the traveler fluency in reading these spaces. It requires moving not just people and trains, but information and knowledge—not just matter, but meaning.

Countless posters, videos and announcements direct passengers to have their ticket and identity card ready, forbid passengers from carrying dangerous items into rail space, tell them how to treat personnel, other passengers and station environs, and where to go and where not to go (see Figure 4.14). Intercut with these messages specific to rail space are another set of discourses which interpolate a wider range of subjectivities. Advertisements for automobiles, luxury products and home décor assume a wealthy and sophisticated target audience, while nationalist propaganda interpolates passengers into the position of patriotic, civilized citizens. These messages concerning how to be a passenger and how to be a citizen are not wholly distinct. Often literally intercut on the same screens, both discourses moreover interpolate subjectivities through the production of affects of pride, shame, consideration and discomfort in relation to fellow passengers, personnel and rail environments.

Figure 4.14. A video playing on a screen on the exterior of the Chengdu Station ticket office shows the consequence of carrying dangerous items through security: embarrassment at inconveniencing other passengers.

From nearly any point in rail space, signs direct passengers to ticket offices and ticket machines, to public security or lost luggage, to toilets and water taps and food, to

entrances and exits, waiting rooms and boarding gates. In a literal interpretation of Latour's sleeping policeman, some signs take the form of station agents indicating the location of services or answering presumed questions. The very ubiquity of these directions highlights the degree to which their discursive content is firmly situated in particular material contexts: *this* sign indicating the nearest toilet is not interchangeable with an identical sign ten meters away. These signs represent rail space *egocentrically*, meaning according to the particular perspective of a situated perceiver (Klatzky 1998). Other navigation aids take the form of maps, representing rail space within an *allocentric* reference frame, locating points within a framework external to the passenger and independent of their position (Klatzky 1998). In order to use these maps, passengers must learn to adopt the perspective of rail space's architects and managers. They must conceptualize of the station from a holistic point of view. Passengers accomplish this feat quite adeptly, but their skill in executing "the god trick of seeing everything from nowhere" (Haraway 1988, 581) should not prevent us from reflecting on how odd it is. The ubiquity of this skill betrays a salient fact: a crucial element of being a passenger within rail space, of inhabiting infrastructure, is to learn how to adopt the perspective of those who manage it. The craft of being a passenger encompasses, in part, not just the practices of rendering oneself legible, but to read oneself through the same set of representations used by the system. To be a passenger demands a certain kind of double think, a simultaneous awareness of one's own perspective and that of another. This practice is essential for anticipating what constraints the system puts upon passengers and perhaps more urgently, for anticipating what deviations it will tolerate.

National maps, in contrast to station maps, are few and far between in rail space. Insofar as rail space is national space, it is constituted from the inside out rather than from the borders in. Even route maps showing the order of stations is rare; I encountered only a handful of schematic maps showing the layout of China's national rail network. When I did see them, it became clear why they were so uncommon: the complexity and scale of the network makes looking at a national scale map useless for determining routes. Moreover, there is the added complication of multiple services running parallel routes before diverging, running along the same route but hitting different stops; the range of possibilities overwhelm what any traveler could plan around. In Guilin, a small but touristy city, I came across a simplified time table covering all the services operated by the Nanning Railway Bureau: even this sub-section of the national network covered a bulletin board in fine type (Figure 4.15).

Examining time tables like these amply demonstrate the cognitive burden that computerized ticketing has removed from the shoulders of passengers and ticket agents. Working from a start and end point simplified the choices to a manageable number between which people can make reasonable judgments. Yet interfacing with the rail system purely in terms of departure and arrival stations has substantial import for how passengers conceive of the network. A historical comparison draws out the contrast: a 1921 gazetteer-style guidebook for the Jin-Pu line described each stop in sequence, relating information concerning local specialties and sites of historical significance (Köll 2019, 157–58). The subject of the book is the particular line, conceived of as a linked spatial and temporal progression. Selecting a route on 12306.cn by selecting a departure station and arrival station, in contrast, conceptualizes the stations of the network as nodes

Figure 4.15. As a glance at this "simple and clear" (简明 jianming) time table suggests, even presenting the basic route information for one of China's sixteen railway bureaus makes for an unwieldy display.

connected by interchangeable linkages. Individual routes or services, regions or provinces are abstracted away: only stations are grasped directly, and not by geography but by sign. Schivelbusch traces a similar phenomenon in early European rail travel; as Proust put it, "railway stations […]do not constitute, so to speak, a part of the surrounding town but contain the essence of its personality just as upon their signboards they bear its painted name" (quoted in Schivelbusch 1986, 40). The China realized through the rail network is to a large extent an urban archipelago, composed of those cities large enough or fortunate enough to have a station through which they become knowable.

Signs are deployed in concert with physical barriers to direct the flow of passengers through the at-times rather complex topology of rail space. More than complex, the spatial organization of stations is constantly shifting. The walls and doors of railway stations are supplemented throughout with mobile barriers, allowing personnel to reconfigure the flows through plazas and waiting rooms in response to changing conditions. Blue plastic or metal a bit over a meter high, these waist- or chest-high barriers are a standard technology throughout rail space. During Spring Festival, these barriers form the walls of temporary waiting areas and expanded queues that fill station plazas; the excess barriers collect in quiet corners during the rest of the year. On a daily or weekly timescale, they serve to redirect passengers around closures necessitated by breakdowns or maintenance. In many HSR stations, the security checks at the entrances to the cavernous waiting rooms are built from such barriers, betraying their origins as a relatively recent addition to Chinese rail space. In fact, stations abound with more permanent fixtures rendered superfluous or problematic by changing passenger needs and security requirements. Doors that once offered direct access to waiting rooms or boarding

platforms are locked shut with cables wound awkwardly around push handles and entrances converted to exits are marked with cardboard signs: the configuration of rail space is ongoing and improvisational.

Though the tools of a much more direct and coercive sort of control are plain to see, the flow of people through stations is largely self-regulated. Passengers adhere, mostly, to the regulation of rail space because it works well enough for them to do so. The use of barriers, physical and discursive, speaks of the quiet struggle between passengers and personnel throughout rail space. Those responsible for rail space must deal with an infinitely creative flow of passengers capable of repurposing rail space in a multitude of unanticipated ways. While much of the direction aimed at passengers is quite pragmatic, there are clear efforts to establish a sense of proper comportment among passengers as well. On station exterior and in waiting halls, and especially in HSR carriages, posters and videos exhort passengers to comport themselves mindfully, attentive to the needs of the rail system and the needs of their fellow passengers. Videos in HSR carriages exhort passengers to minimize their impact on others: do not bring smelly food on the train, do not throw garbage on the floor, do not have loud conversations or snore. The comportment of rail personnel is also a target: station personnel are exhorted to "take service as your mission; treat passengers as family." These practices are represented as being more "civilized" (文明 *wenming*), part and parcel of larger efforts of the Chinese state to shape the social qualities of its populace (see Figure 4.16).[§§§]

[§§§] For a longer discussion of Chinese discourses around civilized-ness and social quality (*suzhi*), see Chapter VII.

Figure 4.16. In an HSR carriage between Lanzhou and Urumqi, educational videos demonstrate "civilized" and improper ways to eat, speak, and behave.

Signs and barriers discursively and materially shape flows of passengers through rail space, not as distinct processes but as two sorts of material-discursive things: the brutely physical communicates meaning, and the semiotic betrays a stubborn materiality. The signs that proliferate in rail space do not float unanchored—they are made manifest in rail space through particular material technologies: a map, a screen, a signpost, a speaker. These materials situate the signs in rail space, both enabling them to communicate meaning to passengers, and also subjecting them to hindrances of sight lines, ambient noise, wear, and incomprehension. They are peculiar example of Haraway (1988)'s "situated knowledge," a view from somewhere, via certain prostheses, for a certain set of eyes. These signs rely on a particular kind of passenger to be effective—one who is fluent, not only in the Chinese (or, to a certain extent, English) language but in

Chinese culture, and in the unique milieu of rail space. Conversely, barriers are not generally experienced through physical collision but are also interpreted—their materiality is also read. The signage of Chinese rail space does not just produce a particular spatial assemblage, but a particular human assemblage as well.

3.7. Station Interiors

A handful of basic station layouts describe the vast majority of railway stations. Some variation is due to the nature of the station's position in the network: major stations serving multiple lines have different design constraints than stations serving only a single route. More significant variation is found between older stations built around multiple separate waiting rooms and newer stations built around a single, shared waiting room with multiple gates to the platforms above or below. Guangzhou Station is an example of the older design. Fronted by a large plaza connecting to the surrounding streets, internally it is organized into a number of separate waiting rooms serving particular trains. As each train becomes ready for boarding, those passengers gather their luggage and follow what can be a rather long and winding path, descending and ascending in order to reach their boarding platform. The signage on these platforms is sometimes lacking: passengers follow each other and the directions of strategically placed station personnel more than signs. Commercial space is limited: convenience stores sell instant noodles, hot water bottles and travel-friendly snacks, and a few restaurants offer hot food. Beijing Station, the grandest of the old stations, has a Starbucks.

New stations, like Guangzhou South Station are not just bigger and newer: they offer a wholly different experience. Well integrated into highways and subways, they are often difficult or impossible to get to by foot, surrounded by ongoing construction and

car-only roadways. Stations built above the lines typically have an upper level which consists of a single large waiting hall with a row of boarding gates connecting to the middle, boarding level, with stairs descending down to a wholly separate exit hall below. This enables a clean, unidirectional flow of passengers: arrivals exit the train and move downwards, while a flow of departing passengers descend from above to board. The single waiting area allows passengers to circulate freely among the storefronts located within the waiting area, making every waiting room into a sort of mall. Kiosks on the waiting room floor are filled with high-end luxury boutiques and expensive brand-name franchises like Starbucks and KFC (see Figure 4.17). In more established stations like Shanghai's Hongqiao Station, the waiting hall is full of restaurants, cafes, convenience stores and boutiques. In just-opened or more peripheral stations, many or even the bulk of the commercial spaces are vacant (see Figure 4.18).

Most stations serve either conventional trains or HSR: particularly in larger cities, a new station was built from scratch to serve HSR routes. HSR track is routed according to different constraints of straightness and incline; the distance can to some extent be explained by technical reasons. These new HSR stations tend to be distant from the city center, but also tend to be much better integrated to the city subway. However, even when the same station serves both, such as Beijing West Station or Tianjin Station, the station interior is configured in such a way as to separate passengers traveling by HSR from those traveling by conventional trains.

Despite their size, central stations are more crowded than those serving single lines. Large stations are chaotic and loud, and serve a constant flow of arrivals and departures. In these stations, a keen eye for crowd dynamics is as effective a method for

Figure 4.17. The waiting hall in Shanghai's Hongqiao Station is fully equipped with Starbucks, McDonald's, KFC, and Real Kungfu noodles.

navigation as reading signage, and procedures for buying tickets, moving through security and boarding are well-established and efficiently conducted. Smaller stations served by only a few trains an hour, or day, have slower, more variable rhythms. Rather than a constant bustle, activity peaks and wanes dramatically as trains come and go. Procedures vary a great deal more, and are much more ad-hoc. The ticket office might consist of a lone ticket window, served by a single agent. Rather than separate boarding gates or multiple waiting rooms, the single waiting room has a single ticket gate. Stations serving only conventional rail occasionally lack automated ticket scanning gates altogether, relying on station agents to check tickets of boarding passengers (see Figure 4.19).

Figure 4.18. The second floor shopping promenade in Guiyang North Station is completely vacant; passengers are afforded only a generic convenience store.

Figure 4.19. The waiting room at Zhuozhou Station, a mid-line stop between Beijing and Baoding. Boarding is conducted without digital assistance: printed placards indicate the next train, and tickets are checked by hand.

3.8. Bourgeois Stations and Red Stations

Along with directions for passengers about where to go and how to behave, the discursive environment of rail space is also saturated with two other sorts of texts: advertisements for commerical products and services, and state propaganda. Host to a captive audience of waiting passengers, rail space is a target-rich environment for the same advertising pervasive in every other public space in China. In new stations built to serve HSR, ads for water purifiers, amusement parks, automobiles plaster walls and pillars, and play on loops on digital displays showing gate assignments. Moreover, in station after station, it is the same ads: in Chengdu, Guangzhou, Beijing, and Wuhan, celebrities like Angelababy advertise home water purification systems and sleek modern home furnishings. Ads for the companies that sell advertising for the national HSR network are also all over, promoting their ability to cover the entire nation with a single campaign. The particular products featured in advertisements within HSR stations interpolate a particular kind of rail passenger: a wealthy, cosmopolitan consumer with the means to purchase a home and the means and taste to decorate it in an upscale, modern fashion. The ads within older stations serving conventional trains interpolate an altogether different ridership. There are fewer advertisements, and those that are present advertise Alipay, fancy liquor, job hunting websites, and over-the-counter medicines. Some furniture advertisements as well, but without the top-tier celebrity endorsements. These advertisements target a consumer both more modest in means, and less desirable to the seller.

Alongside commercial advertisements is state propaganda: posters boldly proclaiming the 16 Core Socialist Values and Xi Jinping's ineffable China Dream. Often

literally wallpapering passageways, these nation-wide propaganda campaigns and their more localized variants blend into the strident discursive environment of rail space. The distinctions between directions, advertisements and propaganda is not always clear: ads for the Eight Route Army Cultural Tour bridges commercial and political; Lei Feng Spirit help desks blur the line between navigating rail space and CCP propaganda; and advertisements for rail travel within rail space remind the passenger that China Railway is also a commercial enterprise. Nonetheless, different stations combine these three themes in different amounts: Xinzhou Station and Taiyuan Station in Shanxi province are extremely "red" in comparison to the rather bourgeois atmosphere in Shanghai Hongqiao and Guangzhou South.

The signage of some stations relates to discourses with more regional valences. The façade of Guilin North Station has, alongside Chinese characters and English letters, its name written in Zhuang, a rare reminder that Guangxi is one of China's minority nationality autonomous regions. In the Pearl River Delta, the name of Guangzhou Station in flanked by eight characters lit with neon: "Unify the motherland, revitalize the Chinese nation" (统一祖国，振兴中华 *tongyi zuguo, zhenxing Zhonghua*). Replacing a slogan praising Mao Zedong Thought and the Chinese Communist Party, the sign appeared in 1986. During reform and opening, Guangzhou Station became the first stop for entrepreneurs traveling from Hong Kong, Macau and Taiwan into the mainland: the sign welcomes them back, situating these "overseas Chinese" as exiles re-united with their ancestral home (*Southern Metropolitan* 2014).

Between signage, advertising and propaganda, rail space can be discursively overwhelming, with myriad texts and symbols competing for attention. Parsing this

complex landscape demands passengers develop what anthropologist Cristina Grasseni (2007) terms "skilled vision", to develop an eye for picking out the right sign amid a torrent of information. In rail space, much of the skill is filtering: shutting out the imperatives to do this and buy that in order to create space for what the passenger needs from rail space rather than the other way around. One measure of this: during my early fieldwork, I was struck by a particular slogan that appeared on billboards and banners throughout the rail system, most notably on the LCD display in HSR carriages that displayed also the train's speed and the next stop. The slogan reads "safe and top quality, build rail and strengthen the nation" (安全优质，兴路强国 *anquan youzhi, xinglu qiangguo*), capturing very succinctly the entanglement of rail and nation that my research seeks to investigate. Despite its ubiquity, however, when I asked passengers about it no one could recall having seen it. The same was true for the educational videos about how to behave within and how to navigate rail space which interested me: to knowledgeable rail passengers, these texts were entirely filtered out of conscious awareness.

3.9. From Platform to Carriage

Boarding the train is the moment of greatest physical danger in the rail journey, where the passenger-oriented spaces of station and carriage rub up against the industrial infrastructure necessary to fling tons of metal and flesh across the landscape at hundreds of kilometers per hour. Boarding procedure differ between conventional and HSR trains. On conventional trains, a team of station and train personnel work together to coordinate the boarding process. From the station waiting room, agents indicate or bodily lead the sometimes rather labyrinthine way to the correct boarding platform. At the platform, a steward stands at every door, checking tickets to ensure passengers are boarding the right

carriage and assisting passengers onto the train. At smaller stations without raised platforms, stewards set out a narrow set of stairs for passengers to climb, which can challenge the dexterity of older or heavily encumbered passengers. On the platforms of larger stations, a boarding ramp bridges the gap between station and train, physically assembling a smooth, joined surface (see Figure 4.20). After boarding, stewards manually disengage the train from the station platform: remove the ramp, fold up the stairs and close the door before departure.

Figure 4.20. At a stop on the train between Nanchang and Liling, heavily-loaded passengers board across a small ramp as a steward checks their tickets.

HSR trains automate and simplify the process of boarding as much as possible. Adhering to tight time tables, HSR trains arrive and depart in a tightly choreographed procedure. The narrower temporal tolerances, however, also demand a novel degree of coordination and cooperation from passengers. Passengers file onto platforms before the

train arrives, queueing up where the door to their carriage has not yet materialized: they locate the proper location through small colored plaques set into the platform (Figure 4.21). A handful of station agents look on, but passengers largely sort themselves into the correct queue. When the train arrives, automatic doors slide open and exiting passengers and smokers file out and boarding passengers file in. The gap between the train and the platform is only a few centimeters, so there is no need for a ramp. At terminuses the lines into the train can become snarled as passengers push past each other to locate their seat and a place to stow their luggage; stewards stand by at some doors to direct passengers unsure which direction to go to find their carriage. After a short stop, sometimes as little as one minute, the doors beep in warning. The train conductor stands at the head of the train and looks down its length, checking that all the doors are clear. She blows a whistle and boards; the doors shut behind her and the train is off once more. HSR boarding procedures use tighter tolerances and automation to lessen their dependence on the active role of personnel; but equally essential to HSR's smooth and timely function is an increased dependence on the active work of passengers to arrange themselves efficiently and quickly proceed to their proper place.

4. Carrying On

Once onboard the train, without the focus necessary for navigation, the travel experience is stripped down to its most basic core: how to meet one's essential human needs while dwelling within rail space.

Figure 4.21. The colored plaques embedded in platforms serving HSR trains facilitate boarding by showing passengers where the doors to the train will be located once it arrives. When the train misses its mark, passengers and personnel have to scramble.

4.1. The Practices and Symbolism of Hot Water

Hydration, along with food and shelter, is a human need met in rail space by a combination of infrastructural provision, passenger self-reliance, and self-denial. Hot water taps are one of the most pervasive and distinctively Chinese affordances of Chinese rail space. Omnipresent in carriages and station waiting rooms, electric water heaters come in a variety of sizes and configurations, but all deliver boiling hot water freely to passengers, subtending a multitude of traveling practices and class discourses. Drinking hot water is a practice with a surprisingly enduring role within China's modern state formation: the push to universalize drinking boiled water began in 1934, with Chiang Kai-shek's New Life Movement, a massive campaign by the Republic of China to forge a

new kind of citizen. At the center of the movement was a set of rules laying out the parameters of civilized and modern life, covering everything from being patriotic to queuing at train stations; and of course only drinking boiled water (Fukamachi 2010). While long a part of Chinese health practices, the cost of heating put boiling drinking water beyond the means of most people (Rogaski 2004). Exhortations aside, the New Life Movement did little to change that reality. The Patriotic Health Campaign in the 1950s, however, aimed to radically reshape hygiene at the societal scale, providing hot water door to door in some cities.[****]

In order to access this resource, however passengers have to come prepared with the right tools. Soft sleeper carriages, described later in this section, provide an insulated water pot in each compartment, but elsewhere in rail space those wishing to fetch water for drinking must provide their own thermos. Insulated water thermoses are a common sight in rail space, and elsewhere in China. Sometimes filled with tea leaves or other herbal infusions, but often with just hot water, thermoses have become a powerful social signifier. Among my interviewees, drinking hot water was seen as traditionally Chinese: a point of stubborn pride for aficionados, and a weird relic by its detractors. In 2017, a photo posted on Weibo become the center of an internet sensation: it showed the drummer of seminal 90s Chinese rock band Black Panther sitting backstage holding a thermos. The thermos became symbolic of China's "middle age crisis," a harbinger of China's rapidly aging population (*Sina News* 2017). Chinese netizens debated whether this made Black Panther uncool, or if it made thermoses cool. At Black Panther concerts,

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[****] For a detailed discussion of the history of drinking hot water and state-making in China, see Chapter VI.

fans began to hold up thermoses overhead, in place of lighters. On the other side of the generational divide, the continued ubiquity of hot water taps in rail space is not matched by ubiquitous use. Younger, more urbane travelers who don't trust the quality or dislike the taste of the freely provided hot water—or find carrying a thermos insufficiently cool—turn increasingly to bottled water. Rail space has begun to adapt: in 2015, Shanghai Hongqiao station installed a drinking fountain in its waiting room that provides both room temperature and boiling water (Aquacup 2015). The fountains I encountered in Shanghai and in Wuhan remain, however, an oddity within rail space.

Omnipresent hot water taps also make possible the still popular practice of bringing dry instant noodles along on rail journeys. Quotidian and ubiquitous, instant noodles play a surprisingly fluid role in the global food system (Errington, Gewertz, and Fujikura 2013). In China, the world's leading consumer of instant noodles ("Instant Noodles at a Glance" n.d.), they have a particular association with the rail journey. Because hot water is always available, passengers can make themselves a hot meal at any time during their journey for only a few yuan. More recently, the combination of health concerns and rising income has put a dent in instant noodle consumption. For many Chinese consumers, instant noodles are reminiscent of the hardship and struggle of the eighties and nineties, a time they are happy to leave behind. From a peak of 46 billion servings in 2013, Chinese instant noodle consumption fell below 40 billion in 2016 and 2017. In 2018 and 2019, however, consumption rose again: according to the *China Daily*, this reflects the invention of higher-end noodles attracting more discriminating consumers (Zhao A. 2019). Others, however, argue that the uptick portends an economic downturn (Leng 2019). In rail space, instant noodles are a particularly fraught topic:

given their strong association with traditional practices of rail travel, they are perceived by some as not quite "civilized" enough for modern high-speed rail. The issue leapt to the forefront of public opinion with the "Noodle Auntie" (泡面姐 *paomianjie*) incident. In 2018, a video of a woman ferociously berating a man for eating instant noodles on an HSR train went viral. While the stewardess quietly advised the man to stop, netizens leapt to his defense, ultimately forcing the woman to issue a public apology (*Sohu News* 2018). These days both conventional and HSR long-haul trains offer meal services and snack carts, but as fewer passengers travel day-long itineraries, more passengers simply opt out entirely, foregoing food on the train altogether.

Hot water taps illustrate the difficulty of drawing clear boundaries between rail infrastructure and rail passengers. A passenger must carry an insulated drinking container to get water within rail space, by the same token a passenger can also set off from Beijing to Guangzhou with a plastic bag full of instant noodles, confident that she will be able to get hot water at any point on that journey. Passengers, things and rail space depend upon each other to function, forming a human and non-human sociotechnical assemblage—although not one without internal tensions. While hot water taps fix a certain set of practices in relation to the affordances of Chinese rail infrastructure, it does not fix their social meaning; passengers navigate these competing discourses as they navigate rail space.

4.2. Smartphones

If hot water taps and instant noodles are remnants of an older rail assemblage lingering on, the smartphone is a harbinger of the future of rail travel. The smartphone has become a central object knitting together the human and technical elements of the rail

assemblage. This role builds on the pivotal role of smartphones at the intersection of e-commerce and state biopolitics outside of rail space, offering a case study to explore the emerging contours of China's state-commercial smartphone-assemblage. Moreover, the integration of smartphones into rail practice shows how passengers can drive development from the bottom up. As discussed in the previous section, smartphones have become the typical platform for ticket sales among the young, the wealthy, the urban and legible. Yet that role is dwarfed by their role as all-purpose navigation, communication and entertainment device at every step of the rail journey. Passengers can do all this without leaving a single app: WeChat.

Since its launch in 2011, WeChat has rapidly spread and evolved to become a nearly inescapable element of everyday life in China. Initially designed by Tencent, one of China's tech giants, as a messaging app, WeChat has achieved status as fundamental social and economic infrastructure by leveraging network effects: once in place as a social platform, it rolled out a digital wallet service, WePay (微信支付 *weixinzhifu*), that quickly become ubiquitous for businesses ranging from telecoms to noodle carts. While not the only digital wallet service in China, WePay is the largest. WePay is so ubiquitous it has become part of China's financial infrastructure, "a de facto payment standard in China; that is, a 'set of agreed-upon rules' that links multiple communities of practice across space and time" (Plantin and de Seta 2019, 9; quoting Bowker and Star 1999, 13–14). WeChat's launch of "small apps" (微信小程序 *Weixin xiao chengxu*), essentially apps-within-an-app running on WeChat's proprietary API, further cemented WeChat's infrastructural centrality to nearly every aspect of daily life: one can chat with friends, post photos, order food, read the news, summon a taxi, find an apartment, and pay bills,

all without exiting the WeChat app. Plantin and de Seta (2019) further argue that WeChat's infrastructural character is deeply entangled with the techno-nationalist project of the Chinese state, both benefitting from a market closed to international competition and from a foundation of ICT infrastructure developed by the state. As of late 2017, it can even be used to buy train tickets: 12306, China Railway online booking service, finally released a WeChat small app accepting payment via WePay (*Xinhua Net* 2017b).

Not limited to the digital realm, WeChat leaves its mark on the material environment of rail space, in the form of *erweima* (二维码), or QR codes. QR codes offer an illuminating example of how arbitrary decisions can snowball into distinct cultural spheres. Invented in the nineties in Japan, in China QR codes have become part of the texture of everyday life (Ouyang 2018). WeChat users can use their smartphone cameras to scan these two-dimensional barcodes to connect to other users or download apps rather than enter that information via hand. More crucially, QR codes enable customers to quickly and conveniently connect merchants' WePay accounts at the point of sale: QR codes allow digital payments to permeate everyday life, rather than remain limited to the virtual world. Beyond their use in storefronts, in rail space QR codes incorporated into station maps, official notices and advertisements, turning these static inscriptions into gateways connecting passengers to virtual helpdesks, support lines and webpages. The QR code on rail tickets pulls up the 12306.cn WeChat app, displaying up-to-date arrival and departure details.

WeChat's greatest role within rail space, however, hearkens back to its first purpose: as a medium of communication. WeChat enables passengers to employ the "empty time" of rail travel to connect socially—though with their digitally proximate

friends and family rather than with their physically proximate seatmates. On board trains, it was a common sight to see passengers with their heads bent over their phones, texting in WeChat's distinctive texting interface. A smaller number use WeChat's asynchronous voice chat feature to communicate: to hear the message in loud spaces, listeners have to hold the speaker directly to their ear, a distinctive posture. Some daring individuals even use WeChat voice chat in the quiet of the carriage, though that is a behavior that is discouraged.

Despite WeChat's moves towards becoming a nearly self-contained mobile operating system, it is not the only app available. E-commerce apps like TMall, formerly Taobao, or Jingdong are another attractive way to pass time, and streaming video apps like Youku are another popular option. This broad array of smartphone applications allow passengers to self-entertain rather than depend upon other passengers to pass the time. Yet that self-sufficiency only lasts as long as their phone's battery life, and WeChat is an app that is notoriously hard on battery life. While electrical sockets or charging stations are sometimes available, they are far from common enough that passengers can depend on finding one. Instead, passengers who want to ensure uninterrupted electricity must supply their own, in the form of the external battery.

External batteries are popular in China in many contexts, but they are particularly important while traveling by rail. These batteries, roughly the same size and shape as a smartphone, extend the life span of smartphones to accommodate the temporality of rail travel. At the same time, the infrastructure of rail space is evolving to accommodate a smartphone-dependent passenger base. Most HSR carriages are equipped with publically available outlets, allowing people to charge their smartphones—though it is not yet

universal. Newer carriages have an outlet in every row, though older HSR carriages may have only a single outlet near the toilets. In conventional carriages, availability of outlets is even less reliable: while sleepers are generally equipped with a handful of outlets in the hallways, hard seats and soft seats quite often provide no access to electricity. This differential of access exacerbates the differing socialities of HSR and conventional carriages: HSR passengers can anticipate spending their brief journey ensconced in a bubble of smartphone-mediated entertainment. Forced to spend longer journeys with less access to electricity, passengers on conventional carriages must rely on older practices to pass the time on board.

In allowing passengers to re-inscribe existing social connections rather than form new ones, WeChat—and the larger smartphone assemblage—constructs rail space as a national space in way that is very distinct from the way that pre-smartphone rail practices did. WeChat's ecosystem of services is to a large extent nationally circumscribed, and WeChat's users are overwhelmingly China-based: in community and practice, WeChat delineates a Chinese assemblage. Yet where onboard social connections were largely happenstance and egalitarian, WeChat allows for a production of community at the scale of nation that is structured and hierarchical.

4.3. Carriage Atmospheres

The character of Chinese rail carriages has evolved a great deal in past decades, both in terms of comfort and in terms of sociality. A travel experience once characterized by extremes of hot and cold, the press of restless bodies has gradually transformed by the addition of new technologies like fans, air conditioners, padding, electrical sockets and wifi, as well as by new, stricter expectations for passenger and personnel behavior.

Passengers need to tolerate less, and their own tolerances are not put to the test. Prior to the advent of HSR, differences between conventional carriages loomed much larger: hard and soft seats, and even the occasional luxury sleeper, covered a greater range of comfort and style. While distinctions remain between conventional carriages, they are dwarfed by the distinctions between conventional and HSR carriages. Conventional carriages are divided into seats and sleepers, hard and soft. Hard seats used to be hard: bare wood, without padding. Nowadays, the benches are now padded, only slightly less so than soft seats. The superior comfort offered by soft seats is now more a matter of spaciousness than softness: these carriages pack four seats per row rather than five, and more importantly are the last seats to be bought, offering a better chance of a bench to oneself instead of a potentially noisome neighbor. Since the introduction of HSR, soft seat carriages have become less common: for anyone willing to pay more than the bare minimal cost of a hard seat, HSR is a vastly superior option.

Hard sleepers are the preferred choice for overnight, or even long distance travel. With six bunks to a compartment, and a compartment open to the hallway, they offer considerably less privacy than the four-bunk, closed-door soft sleepers. That privacy isn't always desirable, however: some women reported that the enclosed space of the soft sleepers felt less safe than the relatively public hard sleepers. Whether hard or soft, on conventional carriages traveling practices operate on the assumption that a certain amount of invasion of space and intrusive sounds and smells are inevitable and that the onus is on the other passengers to tolerate it, especially on long hauls (see Figure 4.22). Passengers prepare food: not just instant noodles and hard-boiled eggs, but groups or families prepare more elaborate meals in cookware brought along for the journey. The

arrangement of seating on conventional trains encourages socialization: rows of seats face each other across a small table, and on sleepers passengers share the bottom bunks to talk, eat and play cards. Groups of passengers sit facing each other and spend the journey slowing eating a bag of oranges or sunflower seeds while they pass the time with conversation. At some stops, vendors sell snacks or hot meals from carts on the station platform; conventional trains stop for long enough to make it possible to get off and make purchases. The smell of cigarette smoke wafts through the compartment: while smoking isn't allowed in the carriage proper, it is permitted in the spaces between compartments. As the journey progresses, odors less pleasant still waft down the carriage from the toilets.

Figure 4.22. A hard seat compartment on the Urumqi-Chengdu train, just outside Chengdu. Note the metal hot water thermos in lower left.

Through distinct design and personnel comportment, HSR carriages mark a dramatic break from the norms of conventional carriages, constituting HSR as a distinct social space. HSR carriages impose different expectations about what is considered proper bodily comportment. While HSR carriages are broken into second-class, first-class and business, these heightened expectations apply within all. Not only is there less tolerance for behaviors that negatively impact other travelers, there is a constant onslaught of instruction within HSR carriages about what constitutes improper conduct. The arrangement of seating on HSR trains is distinct from conventional rail: arranged in rows all facing the same direction, making conversation with anyone other than the passenger in the next seat over inconvenient (see Figure 4.23). This spatial difference is reinforced by signage and advertisements discouraging noise. Even official pronouncements however marshal not the disciplinary coercion of law but the quiet pressure of social expectation: smoking, having loud phone conversations and other misbehavior is depicted as drawing the ire of fellow passengers, not of rail personnel. Instead of entertaining each other, on HSR passengers use smartphones to surf the internet, watch movies, read news or fiction, watch basketball games, message friends or shop. The occasional loud WeChat voice conversation, or action movie blasting at full volume, is the exception rather than the rule. Watts (2008) describes the practices of UK passengers in terms of a reconfiguration from "packed" to "unpacked" states, spreading out laptops and newspapers as they settle in for the ride. Chinese passengers are much more self-contained, rarely unpacking more than a phone and a water bottle onto their tray table.

Figure 4.23. A second class compartment on the Wuhan-Guangzhou line. HSR trains are distinguished by a different standard of comfort and service.

The contrast between expectations of passenger behavior on convention and HSR carriages was brought home to me on a journey on conventional rail in Sichuan. I had taken a high-speed train out of Chengdu to Jiangyou, a nearby city. Sichuan stands out on the national-scale map of Chinese HSR: it is a small tangle of unusually short lines connected to the rest of the network through a single line to Chongqing. After the devastating 2008 Wenchuan earthquake, infrastructure such as the railway line to Jiangyou was a major form of economic stimulus and symbolic of the state's commitment to rebuild the province (W. Wang 2008). I rode the HSR out to the end of the line, and bought a ticket on an old-style passenger train for the trip back. As the train pulled up to the platform, I was surprised to see the route: Urumqi to Chengdu. The first thing I noticed entering the carriage was piles of huge bags; I soon learned that the train

was in the last hours of its nearly two-day-long trip, full of migrant laborers returning home before the New Year. My seatmates were eager for conversation and regaled me with the trials of their journey: one middle-aged woman, one of the few women in the carriage, was particularly eager to chat. We talked until the train stopped at the next station, Mianyang. There, a good fraction of the migrant workers got up, threw enormous bags over their backs and disembarked.

The passengers who boarded were strikingly different: in the place of heavily-laden long-haul migrants were well-dressed urbanites carrying a handbag or daypack hopping onto the last train of the night back to Chengdu. An elegant middle-aged woman and a young man traveling together sat in newly emptied seats across the aisle. The chatty woman, directly facing the pair, greeted them much as she had greeted me. The two new passengers ignored her entirely. They very nearly ignored each other: the young man had his headphones in, and the older woman simply kept her gaze locked to the screen of her smartphone. After a few abortive attempts, the chatty woman gave up, and we sat in silence for the remaining half-hour of our journey.

This encounter crystallized for me a disjuncture between Chinese passengers I had been seeing throughout the rail system, highlighting the divergent traveling practices and expectations among passengers of different backgrounds. It is not simply that the women dressed differently, spoke with different accents or even that they belonged to different socio-economic classes; these women each brought different expectations and a different suite of traveling skills into the carriage. One was in the midst of an epic multi-day journey at the end of a year away from home; the other was on a short day trip, never out of cellular data coverage. These skills exist in a specific environmental and social

context, which despite their spatial proximity were dramatically different for each traveler. Seeing these two incompatible practices juxtaposed brought home two realizations: the first was how interdependent the practices of rail travel are, even practices of self-containment. The second was how effectively the Chinese rail system has been organized to minimize contact between passengers with incompatible crafts of rail travel.

The narrowed tolerances for passenger behavior are echoed in narrowed tolerances for mess and stink. Smoking is strictly forbidden on HSR carriages. At every stop, smokers pile off the train and immediately light a cigarette. When the conductor or a loudspeaker announces imminent departure, the smokers stomp out their cigarettes and reboard right before the doors slide shut. The question of hygiene loomed large in passenger's accounts of how the rail system has changed over time, and in the distinction between HSR and conventional services. It was one of the first distinctions remarked upon for many of my respondents, before even increased speed or convenience. When describing the experience of rail travel in the eighties and nineties, passengers returned again and again to how trash would pile up in cars, left to personnel to deal with. Toilets were another source of discomfort to be endured. Many passengers spoke about how they planned ahead, deliberately drinking less water to avoid having to use the bathroom on long train journeys. On both HSR and conventional trains, standards of cleanliness have risen in recent decades, though here as well HSR has set itself apart.

A dedicated cleaning crew—typically older women with the sun-darkened skin of rural migrants—maintains cleanliness, cleaning toilets every half hour and promptly disposing of garbage. Cleaners or attendants pass through HSR carriages regularly to

collect trash from passengers and mop the floors: piles of brightly colored trash bags gather in the aisles before certain stops as cleaning personnel prepare to unload. Cleaning on conventional routes is left to the stewards rather than delegated to cleaners, but follows a similar pattern. Conventional hard seat and sleeper carriages are equipped with small metal trays for trash.

Toilets on HSR carriages are a substantial upgrade from those on conventional carriages, which are sometimes as basic as a hole through which the track is visible below; in contrast HSR carriages offer both sitting and squatting toilets with flushing water. Each toilet has an inspection check sheet hanging from a peg on the wall: cleaning personnel must check off that they cleaned, and then stewards and conductors use the same sheet to check off that they inspected the toilet to ensure that it is clean and de-odorized.

The drab, functional attire of the cleaning crew is a marked contrast to the elaborate uniform of HSR stewards. Another marker of the dramatic break with the traditions of conventional rail is signaled via the clothing and training of HSR personnel (see Figure 4.24). As argued by Otis (2011), marketization of the Chinese economy has led to the formation of a new class of feminized service work, with standards for proper bodily comportment quite at odds with the “gender erasure” of the Mao era. This disjuncture is made material in the uniforms and comportment of respectively, HSR and conventional rail personnel. Where conventional rail personnel, men and women alike, all wear coats and pants of a military cut, and share responsibilities for conducting, cleaning and sales, the personnel on HSR trains are separated into stewards, service workers, and cleaners with different duties on board. HSR personnel, in contrast, are nearly all women,

and their uniforms are hyper-feminine. The attire of male HSR stewards is an afterthought: they wear uniforms akin to those of conductors on conventional carriages. Clothing is the outward marker of a new standard for behavior and service: the brusque manner and militaristic comportment for which conductors have long been known is replaced among HSR staff by an approach oriented towards producing a qualitatively more comfortable traveling experience.

Figure 4.24. The bright pink uniforms of Chengdu Railway Bureau's HSR stewardesses are particularly vivid examples of the feminization of HSR service.

5. Finishing Off

Excepting the case of overnight sleepers mentioned above, passengers are responsible for keeping track of when they arrive at their destination. Gathering one’s things, disposing of trash and exiting into what might be a place one has never been

before makes one suddenly aware the travel fatigue which has been building quietly as the kilometers ticked by. Fortunately, no matter what station passengers arrive in, it follows the same patterns, with the same standards and the same flows as every other station. When I asked my respondents whether they had ever felt lost or disoriented in a rail station, many reported the idea was ridiculous "because every rail station tells you: automated ticket pickup, automated ticket purchasing, ticket office with human agents, entrances, exits, taxi stands, bus stops—even the subway location, they all have clear directions." The rail system does not stand apart from other forms of transportation but is deeply woven into roadways and metropolitan mass transit. Taxis, both liveried services waiting in queues and "black cabs" operated without formal oversight are readily available. Many rail stations stand next to long distance bus terminals, providing service to those cities and villages without a rail station of their own. The integration of rail stations into multi-modal networks becomes crucial to its function as the system increasingly relies on large hubs rather than local stations: Qin (2017) estimates that the total number of passenger stations dropped by more than half between 1996 and 2008.

"Movement," Ingold writes, "always overshoots its destinations" (2011, 53). There is always an excess, a left-over that remains unresolved. This chapter has employed Ingold's four stages of the journey to show how each stage relates to a particular assemblage of spaces and objects that, along with the passenger, constitute rail space. I have shown how these things relate bodies into environments, as the wheels of the luggage relate passengers' hands to the smoothness of floors. I have traced how traveling things like smartphones reappear at multiple stages in different roles, stitching the journey together across time. This account shows how a multitude of disparate things

collectively assemble an environment that is, while far from homogenous, nonetheless sufficiently self-similar to allow passengers to figure out its complexities, acquire bodily habits and even skills in how to navigate and dwell within rail space.

Here I would like to draw out a fifth stage that is implicit within Ingold's account of skilled practice: the phase after finishing off, but before getting ready once again, when the skills actively practiced in the journey are dormant, but not forgotten. "Every ending, however, is potentially a new beginning, marking not a terminus but a pause for rest in an otherwise continuous journey" (Ingold 2011, 59). What remains to the not-now-a-passenger when their journey is completed? Ingold's description of sawing a plank ends with cleaning up, tidying the workshop, putting away tools. Yet this space, along with the tools within it, remain. Moreover, even away from the saw, the practices of carpentry are remembered in the body of the practitioner: one remains a carpenter even without a saw ready at hand. It is in this fallow moment that a skill, once acquired, becomes not just a skill but also perhaps an identity. As the scholarship of skill has shown, the process of learning a skill is often also the process of assuming an identity: becoming a beekeeper (Adams 2018), an angler (Eden and Bear 2011), or a taxidermist (Patchett 2016).

In the case of rail travel, the identity is harder to discern. In a society where nearly everyone travels by rail and only a few keep bees, rail travel is less markedly a skill than beekeeping: there are no formal certifications for rail travelers, no special organizations. Yet as I have shown, despite its ubiquity and invisibility, rail travel is no less a skillful weaving together of self, tool, and environment than keeping bees. Where, then does the identity reside? I argue the skills of rail travel shape senses of belonging at the scale of the network itself—the territory linked together by the topology of station and track.

The passenger's luggage may be packed away, their thermos set out to dry, their ticketing app closed on their phone, but those tools, along with the skills which put them to work, are still there. These things are specific and concrete, belonging to the passenger, but are also standardized, compatible with the environmental affordances of any station and compartment. These things all speak of the possibility of a journey—the imaginability of setting off once more. I have presented this chapter in the form of a single journey, tracing a single line from origin to destination. Yet to be a rail passenger is not to make a single journey, but the capacity to make any number of possible journeys, a capacity latent in the things and the skills assembled in the course of any specific journey. This potentiality is re-iterated again and again in the very standardization of rail infrastructure and in flows of others through rail space. Like Anderson's "mass ceremony" of the daily newspaper (1983), every individual rail journey is conducted in constant presence of countless anonymous others on journeys of their own. Considered en masse, the journeys of all passengers mark out a space of circulation; a perspective adopted by system planners, but one that is also visible to passengers themselves, as they experience the flows through rail space.

Every journey familiarizes the passenger with how it is done, and equips them with the tools to do it, and implies the existence of an infinite series of similar journeys. Yet the skillset and toolset in question retain a particular spatial and social extent: the places which have been constructed according to the standards of rail space, both the technological tolerances of gauge and train, but the social tolerances of passenger practices. For the unique assemblage of the Chinese rail system, intimately shaped by the Chinese state, the extent is quite nearly contiguous with China's national geo-body. Rail

space is home to overt nationalist discourse about the Chinese nation-state, but it is this embodied understanding of what China is that connects that discourse to the lived experience of rail passengers. Rail infrastructure, along with other infrastructures of mobility, turn the conception of a unified Chinese geo-body from a nationalist imaginary into a practical reality for hundreds of millions of Chinese citizens. Mobility infrastructures, along with infrastructures of media, education and employment turn the conception of singular Chinese society from a nationalist imaginary into a naturalized part of everyday life.

CHAPTER V

SCALAR IMAGINARIES OF REGION AND NATION IN THE PEARL RIVER DELTA'S EXPRESS RAILWAY LINK

1. Introduction

In September of 2018, West Kowloon Station, terminus of the Express Railway Link (hereafter: XRL), opened to passenger service. Years behind schedule and over budget, the completion of the Hong Kong section of the XRL was nonetheless heralded as a triumph in Chinese mainland media. The XRL materially realizes China's vision of a country united by rail: the combination of China Railway's online ticketing system, the second-generation Two Way Permit, and the joint-checkpoint in West Kowloon Station work together to enable passengers to board a train in Beijing and in a mere nine hours be standing in front of Victoria Harbor, admiring the iconic Hong Kong Island skyline. While newspapers made much of the XRL's national linkages, the majority of passengers passing through West Kowloon Station have more proximate points of departure: Shenzhen, just across the boundary of the mainland; Guangzhou, the capital of Guangdong province; or one of the other cities of the Pearl River Delta. It is at the regional scale, rather than national, that high-speed rail (HSR) decisively outcompetes air travel (Zhou et al. 2014). The Express Railway Link's Chinese name reflects this regional scope: it is called the "Guang Shen Gang HSR" (广深港高铁 *Guang Shen Gang Gaotie*),: "Guang" for Guangzhou, "Shen" for Shenzhen, "Gang" for Hong Kong.

During the two-decade process of conceiving, planning and building the XRL, it has been imagined at two distinct scales. One of these imaginaries involves Hong Kong's Cantonese periphery: narrowly, the Pearl River Delta, or broadly, Guangdong province.

The second scalar imaginary is more expansive, situating Hong Kong in relation to the nation as a whole. These imaginaries differ not just in their spatial extent but in their interpretive context, narrating the line's meaning in starkly different terms. The regional imaginary characterizes the development of high-speed rail and its complementary migration infrastructure in terms of their everyday convenience and economic benefit to residents of the Pearl River Delta. The national imaginary emphasizes the affective significance of project's spatial integration in terms of a grand nationalist re-awakening of the Chinese people. These imaginaries are distinct but not necessarily in conflict, and regularly appear together in mainland newspapers and official documents. This duality has long allowed the central state, Hong Kong, and Guangdong provincial and municipal governments to cooperate on the XRL without a singular consensus about what the project means. Within the actual implementation of the XRL project, however, these two scalar imaginaries have come into sharper conflict.

In this article, I argue that since its inception, the XRL has gone from a distinctly regional project imagined by regional governments to a project planned and managed by the central state as a key component of nation-wide planning. This shift is reflected both in the project's infrastructure and in the scalar imaginaries through which it is narrated. Between 1979 and the early 2000s, cross-boundary relations, including both transportation and migration control, were primarily managed on the mainland side by local states: provincial and even municipal level government. The XRL first was imagined as a means of connecting recently-returned Hong Kong and the cities of the Pearl River Delta, improving on existing regional infrastructure. In the time since, however, ministries of the central state have gradually but inexorably claimed control

over cross-boundary flows. The XRL has been re-imagined and re-designed as part of a nation-wide network of high-speed passenger-dedicated rail (hereafter: HSR), and control over migration between Hong Kong and the mainland has shifted back to central state ministries. As a consequence of these shifts, the XRL that opened in 2018 was quite different in form and function than as was initially imagined. It is different in discourse as well: today the XRL realizes the "Greater Bay Area" as a "one hour life circle" within which Chinese citizens and Hong Kong and Macau residents alike are able to flow freely in pursuit of prosperity, cultural enrichment, and comfort. The discourse of the Greater Bay Area reveals how the transportation and migration infrastructure of the XRL has been nationalized even as it remains ostensibly part of a regional imaginary: regional flows within the Pearl River Delta now take place within infrastructure standardized at the national scale. Yet differences in how national and regional newspapers characterize the XRL show lingering disjunctures in their respective scalar imaginaries.

This article looks at how state media—newspapers and official government documents—characterize the development of transportation and migration infrastructure to bolster political legitimacy of different scales. The way these articles frame new infrastructural innovations, who they benefit and at what scale sheds light on how infrastructure projects such as the XRL integrate multiple, competing entities into a coherent "state" unified around a "national" interest. The treatment of the XRL in these texts demonstrates that it is intended by both regional- and national-scale state actors to produce new senses of spatial belonging: passengers on the XRL are to imagine themselves within a tight-knit social and economic sphere and to imagine themselves within a vast and prosperous China. The proliferation of discourses such as the "Greater

Bay Area" demonstrate that the national scale has subsumed regional scales, largely if not fully enclosing regional imaginaries within the nation. These sources also show a lingering disjuncture in what scale is prioritized and how the concrete specificities of the transportation and migration infrastructure are understood to produce imaginaries of spatial belonging.

In using the term scalar imaginary, I mean to invoke both Anderson's conception of an imagined national community, as well as draw on theories of scale politics coming out of political geography. Anderson's "imagined communities" posits nations as social constructs which emerge out of a shared literary and material culture (1983). More recent scholars of nationalism have pushed this insight further, investigating how national identities are constructed through the mundane practices of everyday life (Billig 1995; Edensor 2002; Skey and Antonsich 2017). In China, sub-national regional identity has intersected with the imagination of community at the national scale in complex ways. Sub-national identity, particularly at the provincial scale, played a pivotal role in China's transition from empire to nation-state (Schoppa 1977; Duara 1995; B. Goodman 1995b). In contemporary China, both minority nationality identities, which have a strong spatial component (Gladney 1991; Zang 2015), as well as regional identities within the diverse Han (Honig 1992; Mullaney et al. 2012; Joniak-Lüthi 2015) have regained political relevance (Oakes 2000). In the case of Guangdong, historical oppression, linguistic distinction and cultural distance combine to situate "Cantonese" as a highly visible sub-national ethnic community (Carrico 2012; Ferguson 1993). This article builds on these insights by examining one process through which regional identity and national identity are built.

Overlapping scalar imaginaries shape the construction of communal identity and belonging at different scales, and figure as potent "representational tropes" (K. T. Jones 1998, 27) in intra-scalar struggles between different political actors (X. Jiang 2017). Scale is never neutral or natural; in struggles over political legitimacy, scale plays a starring role. Political geographers have investigated how space is shaped into particular scales through scalar narratives which legitimize certain scales discursively, and through institutions and infrastructure which realize those scales materially (Smith 1992; Jessop 2002; Marston, Jones, and Woodward 2005). This literature's conception of scale as malleable and contingent, both an instrument of and a subject of political struggle has been a productive framework for political geographers investigating shifting trajectories of state spatiality in China (Chien 2013; Chien and Gordon 2008; F. Wu 2002). Political geographers have employed scale politics to examine how local states play different central ministries against each other and utilize national imaginaries to legitimize local control (X. Jiang 2017). Their concern with scalar imaginaries, however, remains limited to the sphere of spatial planning among political elites. Scalar imaginaries percolate downwards into everyday life too: in the Pearl River Delta, the development of migration and transportation infrastructure is a matter of concern for residents in the course of their everyday lives and in how they understand their community and identity.

This article seeks to bring together Anderson's imagined communities framework and the politics of scale to analyze how state media positions the XRL's transportation and migration infrastructure in order to legitimize the state at regional and national scales. By transportation infrastructure, I refer to the railways, roads, and bridges which reduce the friction of distance between cities and regions. By migration infrastructure I refer to

the systematically interlinked technologies, institutions, and things through which flows of people and things through those railways and roads are regulated (Xiang and Lindquist 2014; W. Lin et al. 2017). The Pearl River Delta (hereafter: PRD) is a unique site for studying the relation between transportation infrastructure such as rail and migration infrastructures, the interlink technologies, institutions, and actors that condition mobility (Xiang and Lindquist 2014). Despite a high degree of economic integration between Hong Kong, Shenzhen, Guangzhou and the other cities, the PRD is politically and administratively divided between the cities of Guangdong province and the two Special Administrative Regions of Hong Kong and Macau (Bie, Jong, and Derudder 2015). Formerly colonial concessions, the boundaries between these city-states and the "interior" of China are, by Chinese law, internal to the Chinese geo-body, yet continue to function as *de facto* international borders. Consequently, mainland citizens and Hong Kong and Macau[*] residents cannot use either regular passports or national identification, instead relying on a regionally unique set of travel documents cards to travel within the Pearl River Delta. This distinct regional migration infrastructure reflects, and realizes in daily practice, the highly asymmetrical relationship between Hong Kong and the interior. Examining how these documents and procedures have evolved over the past decades makes visible how the balance of power between central and local states has shifted towards the national scale, as well as how those shifts are imagined to shape the perceptions and lives of PRD residents.

[*] Hong Kong and Macau's political, economic and social trajectory since returning to PRC control has been quite distinct. While Macau provides a striking counterpoint to Hong Kong, due to this article's focus on the XRL I will for the most part confine my analysis to Hong Kong.

2. Methods

To understand how state media situates the XRL within the nation-building project of the Chinese state, I collected and analyzed articles appearing in three papers that collectively presented an array of different mainland perspectives on the regionalization and nationalization of the Pearl River Delta. The *Southern Metropolitan* (南方都市报 *Nanfang Dushi Bao*) developed a global reputation for its investigative reporting and "liberal" perspective, although still constrained by China's media control (Y. Zhao and Xing 2012; H. Wang, Sparks, and Huang 2018). The *Southern Daily* (南方日报 *Nanfang Ribao*), which like the *Southern Metropolitan* is owned by the Guangdong-based Nanfang Media Group, strikes a different tone as the long-standing official newspaper of the Guangdong Communist Party. The *People's Daily* (人民日报 *Renmin Ribao*), in contrast, is the official newspaper of the Chinese Communist Party: based in Beijing, it is a reliable mouthpiece of the central Party leadership. Comparing and contrasting these three papers illustrates how different scalar imaginaries of the Pearl River Delta circulate in regional and national media, with a particular attention to how these narratives interpret the material elements of the Chinese rail system and its extension into Hong Kong in the form of the XRL. The Guangzhou papers allow me to examine variation between more and less ideological publications in the extent to which the XRL is mobilized in support of a Pearl River Delta region rather than within a national imaginary.

Conducting research remotely, I used publicly available online archives to gather newspaper articles. I focused my research on the period around the opening of the

railway in the fall of 2018, gathering articles using search phrases such as “XRL”, “one place, two inspections”, “Two-Way Permit” and “Mainland Travel Permit.” This article’s findings are based on a body of 103 articles, including 49 from the *Southern Metropolitan*, 16 from the *Southern Daily*, 21 from the *People’s Daily*, and 17 articles from other Chinese-language outlets, including Xinhua, the *Guangzhou Daily*, and the BBC. English language articles from papers like the *South China Morning Post* and *Hong Kong Free Press* were also collected during this period, and are consulted for context when appropriate.[†]

I fused these articles to build a timeline of the rollout of the various elements of the emergent XRL checkpoint regime to understand the interplay of political and technological development. The history of the transportation and migration infrastructure between Guangdong and Hong Kong is a necessary context for understanding how the XRL’s innovations are altering cross-boundary relations. I then analyzed how these articles mobilize the XRL’s new technologies and procedures within narratives of national and regional integration and economic development. These findings show how the state mobilizes the rail system to promote narratives of territorial integration, as well as how those narratives are subtended and complicated by the infrastructures upon which they rely.

Hong Kong has its own imaginaries concerning the XRL. The XRL is hotly contested within the city: conflicts over the funding, construction and legal impacts of the

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[†] The texts collected for this research are presented in Appendix A. Articles are referenced according to publisher and full calendar date, using the following abbreviations: *Southern Metropolitan*, NFSDB; *Southern Daily*, NFRB; *People’s Daily*, RMRB.

project have played a key role in the development of the Hong Kong pro-democracy protests. Early anti-XRL protests linked the project to issues impacting everyday Hong Kong life like high real estate prices and lack of government accountability, pioneering a "collective action frame" for political dissent (Xia 2016). In 2018, opposition to the West Kowloon joint-checkpoint agreement drew thousands of protesters to gather outside the legislature, and pan-democratic lawmakers inside the legislature expelled for attempting to prevent a vote (K. Chung et al. 2018). Most recently, railway infrastructure, including ticketing machines and even a China Railway passenger train, became targets of vandalism during the massive protests in the summer of 2019 (*BBC* 2019-09-18). Due to legal and linguistic barriers, the Hong Kong discourse is largely separate from the mainland, though clearly not wholly cut off. The dramatic polarization between mainland and Hong Kong perspectives washes out the regional and national distinctions which this article seeks to examine. Accordingly, this article examines the XRL's infrastructure and imaginaries from the mainland perspective, with only a limited engagement with and analysis of Hong Kong perspectives.

3. Rail, Scale, and Community in China

The XRL brings together a number of tensions in China's contemporary political economy. China's history of rail development reflects the tension between national and regional identities highlighted by Chinese studies scholars, as well as the tension between central and local states identified by the politics of scale literature. The roots of these conflicts reach back to the origins of the modern Chinese nation-state more than a century ago, when the Qing empire was first re-imagined by Chinese nationalists as a national community. Guangdong province, as a region with both a strong regional identity and

wealthy and powerful local governments, offers a unique site to study how intra-scalar contention has played out. Guangdong figures prominently but ambivalently in the history of Chinese national imaginaries, figuring as both its founder and its betrayer. While of arguable importance to the relationship between Guangdong and Beijing, this history is key to the relationship between Hong Kong and Beijing.

3.1. Nationalist Imaginaries of Rail

Rail has maintained a central role in how Chinese nationalists imagine China as an integrated geobody, even as how China is imagined varies. Sun Yat-sen, the founding figure of Chinese nationalism, spent his final years detailing a national development plan centered around railroads (Y. Sun 1922; Edmonds 1987). Railway concessions, along with mining (Thompson 2011), were the raison d'être of the wide-spread Rights Recovery Movement, a series of campaigns that were crucial to the mobilization of Chinese people across class and region in the name of anti-imperial nationalism (Chi 1973; Rankin 2002; D. Li 2004; Zheng 2009). These campaigns, however, were typically organized at the provincial scale: a Sichuan organization to recover Sichuan railway rights, a Shanxi movement to recover Shanxi mining rights, and so forth.

The provincial scale occupied a pivotal role in the formation of modern China, becoming a central locus of politics as native place identity was transmuted into nationalism (Schoppa 1977; Duara 1995; B. Goodman 1995b; Platt 2007). A mutually constitutive relation between regional and national imaginaries became, in the warlordism of the early Republic, mutually antagonistic. For warlords like Yan Xishan, railways helped realize autonomous regional spheres of control rather than national unity (Jing 1993). Despite its many imperfections, however, railways played a prominent role

"as an aspirational symbol of modernity and efficiency" during the early Republic (Köll 2019, 161). During the Nanjing decade, as the railways were professionalized (Morgan 2001), they became central to Chiang Kai Shek's nationalist vision: rail travel, with its strict time discipline, was seen as an ideal means for instilling Chinese people with modern citizen subjectivities (Köll 2019, 185–90).

After the defeat of the Japanese, China's railways were for the first time united under a single institution, albeit not yet by continuous track. The Ministry of Railways[‡] (MOR) established itself as a powerful and independent institution within the PRC. The heroic efforts of railway workers and soldiers to repair war damage and build new lines to remote regions made for powerful narratives of national recovery and development and figured prominently in PRC propaganda (Köll 2019, 247–53). The same "railway" values of discipline and punctuality favored by Chiang Kai Shek were re-interpreted as exemplar communist ethics under Mao. In 1966, railways played a key role in the Cultural Revolution, carrying countless Red Guards across the country, many traveling for the first time (Köll 2019, 268). By the late nineties, rail was increasingly symbolic of the poverty China sought to leave behind. The ambitious high-speed passenger-dedicated rail network (HSR) transformed rail into a symbol of its future prosperity. HSR was a national imaginary from its first moment: before a single line was laid, the network was already planned out as a coherent national grid (Bullock, Sondhi, and Amos 2009).

[‡] The Ministry of Railways was dissolved in 2013 and its construction and operations responsibilities were taken over by a new state-owned corporation, China Railway. Given the high degree of institutional continuity between the Ministry and China Railway, I use the terms as chronologically appropriate but treat them as the same entity.

The role of HSR in shaping China's national imaginaries can be seen in the slogans that pervade the system's stations and carriages, as well as in the naming conventions of new high-speed trainsets. China's first generation of HSR trains, initially known only by a series of dry identification numbers, was officially dubbed the "Harmony" (和谐号 *Hexie Hao*) railset in 2007 as part of China Railway's Sixth Speed Up (Mao 2007). President Hu had, just two years before, introduced the slogan of "Harmonious Society" as a governing principle for his administration (Tomba 2009, 600). As explained in Ministry of Railways statements, the new high-speed trains were intended to build the harmonious society that Hu Jintao had outlined; Ministry officials aimed for the new trains to serve as a national symbol akin to the Japanese Shinkansen as well (Mao 2007). As HSR became symbolic of China's economic and political rise, it thus also became symbolic of the centrality of the party-state's governance in guiding and shaping China's national trajectory.

The newest HSR railset, capable of hitting 350 kilometers per hour, entered service in 2016 under the name "Fuxing" (复兴号). Meaning "reawakening" or "revitalization," Fuxing is typically left untranslated in English, marking a shift from the Harmony railset. It is a term with a deep resonance with Chinese nationalist discourse, evocative of early nationalist calls for a "revitalization" of the Chinese people. In the contemporary moment, *fuxing* features prominently in Xi's "China Dream" ideology (中国梦 *Zhongguo Meng*), a slogan omnipresent in stations and carriages. Defined by President Xi Jinping in 2013 as "realizing the great revitalization (*fuxing*) of the Chinese nation", the China Dream roots the party-state's legitimacy in a communal dream of

national prosperity and strength (Callahan 2017). As a new China Railway slogan makes clear, HSR works to realize the disparate elements of the China Dream in a single, tangible form.

In 2019, China Railway put the new Fuxing trains front and center in a new slogan: "Fuxing trains gallop across the motherland's vast and great earth." Cleverly, the verb "gallop" (奔驰 *benchi*) is the same characters which are used for Mercedes-Benz, as much a byword for luxury in China as in the US. "Motherland" (祖国 *zuguo*) combines the character for ancestor and for country, situating HSR's cutting edge technology within a Chinese historical community. This ancient nation is, in turn, situated with "the vast and great earth": the full territorial extent of China's modern geo-body. Bringing together the old and the new, the social and the material, this slogan posits Fuxing trains as the active agents of China's national teleology, fulfilling China's destiny of becoming an integrated national territory and society—and doing so in luxurious style.

Since the mid-2000s, HSR has gone from nonexistent to reaching all but three provinces by the end of 2018; by point of comparison, conventional rail service to Lhasa only opened in 2006. With the introduction of online ticketing in 2011, rail has become contiguous with the nation along yet more dimensions: tickets to any destination can now be purchased via smartphone app, linked to individual passengers by their national identification card, the *shenfenzheng*. With no more than a smartphone and a *shenfenzheng*, a Chinese citizen can travel anywhere in China at any time—anywhere, that is, other than Hong Kong or Macau.

3.1.1. Guangdong Regional Imaginaries

The idea of a high-speed rail linkage between Hong Kong and Guangzhou was first conceived at a moment when local government was relatively unfettered by the central state. Substantive local autonomy for Guangdong has waxed and waned. Prior to the period of reform and opening, Guangdong was kept under tight rein by Northern cadres loyal to Beijing (Carrico 2012, 30). Guangdong's distance from national centers of power has historically made it a dumping ground for exiles, a place for experimentation, and occasionally a rival power center. In the early twentieth century the treaty port of Guangzhou and later the colony of Hong Kong were outposts of capitalism and imperialism, as well as hotbeds for early Chinese nationalism. As discussed by Friedman (1994; 2008), this makes Guangdong the center of an alternative narrative of Chinese nationalism—a narrative that continues to undergird Cantonese regional identity (Carrico 2012). Perhaps more troubling to a new-fledged PRC, however, was Guangdong's history of provincial autonomy: Cantonese warlord Chen Jiongming's 1922 split with Sun Yat-sen has been portrayed in official historiography as a betrayal of Chinese nationalism in the name of regional separatism (Duara 1995, 193–204). Consequently, Beijing's distrust of local cadres in Guangdong was driven by distrust of foreign contamination, lingering capitalist tendencies and of Cantonese regional identity itself (Carrico 2012).

Hong Kong exemplified the party-state's suspicions of the Cantonese. As Guangdong went through the travails of the Great Leap Forward and the Cultural Revolution, Hong Kong stood as an isolated remnant of Guangdong's capitalist and colonial past, and an increasingly tempting image of its future path. Hong Kong was cut off from the rest of the delta in 1950, when the Ministry of Public Security erected a

fence along the Hong Kong-mainland boundary. The fence slowed cross-boundary flows of people and goods to a trickle, severing trade networks and family connections (Vogel 1990, 46). As Hong Kong's economy flourished on the back of its cheap labor and global connections, Hong Kong became an example of what Guangdong could become. During reform and opening, the same reasons of history and distance that marginalized Guangdong under Mao made it an ideal site for economic experimentation: Guangdong was host three of the first four Special Economic Zones that became the engines of China's coastal development (Naughton 2006, 27–28). The provincial government took full advantage of Beijing's tolerance and Hong Kong's proximity, operating by the maxims: "If something is not explicitly prohibited, then move ahead. If something is allowed, then use it to the hilt" (Vogel 1990, 80–82).

Throughout reform and opening, Hong Kong was the lodestar for Guangdong development as well as a source of capital and practical know-how (Vogel 1990). Hong Kong was a symbol of modernity uniquely compelling for residents of the Pearl River Delta in its cultural and spatial proximity. Advances in transportation and migration infrastructure steadily narrowed the gap during the eighties and nineties. Non-stop passenger service between Hong Kong and Guangzhou resumed in 1979, reducing the travel time between Guangzhou and Hong Kong to less than three hours, speeding the movement of people, goods and ideas (*People's Daily* 1979). The proliferation of TVs in the Pearl River Delta spread the influence of Cantonese popular culture hundreds of miles into the mainland, despite official efforts to curb the use of large antennae (Vogel 1990, 66).

Guangdong's cultural distinction, history of political conflict and powerful regional economy combine to make it one of the most salient regional identities in contemporary China. For all that, the Cantonese have received remarkably little attention from scholars: as Mullaney observes, "their status as Han has been so thoroughly naturalized that it has failed to register as a problem in need of consideration" (Mullaney 2012, 6). While a rich body of work has examined ethnic and minority nationality identities in contemporary China (Gladney 1991; 1995; Oakes 2000; Harrell 2011), Chinese studies has only recently begun to re-evaluate the complexity of contemporary Han identity (Mullaney et al. 2012; Joniak-Lüthi 2015). Carrico (2012) poses the question of why the Cantonese are not their own minority nationality on the basis of their distinctive language, culture and history, and concludes that the Cantonese exist as an integral periphery within China's national community. Anchoring the far end of countless North-South stereotypes, Carrico examines how Cantonese people variously accept, contest and invert their marginalization within the Chinese national community, re-imagining Guangdong as an alternate center or altogether distinct spatial entity (Carrico 2012).

The role of Hong Kong is integral to regional and national imaginaries of Guangdong. Yet cultural compatibility alone did not turn the Pearl River Delta into an industrial powerhouse, driven by the synergy between cheap and innovative production networks in mainland China and the globally-connected financial sector in Hong Kong (Bie, Jong, and Derudder 2015). Rather it was the sustained effort of Guangdong provincial government between 1979 and 2000 to develop the necessary transportation and migration infrastructure that turned the Pearl River Delta into the world's factory.

Once built, however, that infrastructure enabled not just economic integration but growing rates of cross-boundary employment, marriages (G. Lin and Ma 2008; So 2003), housing (E. C. M. Hui et al. 2011; E. C. M. Hui and Yu 2009) and even schooling (N. L. S. Leung 2012). These cross-boundary circulations have become increasingly central to official imaginaries of the Pearl River Delta, at regional as well as national scales. The XRL and accompanying changes to migration infrastructure are couched in terms of realizing a "one-hour life circle" in the PRD: a singular space united by ubiquitous, convenient transportation through frictionless boundary crossings. While there is relatively little work on the role of rail in shaping these imaginaries at the communal level, rail development in the Pearl River Delta has generated a rich analysis of China's politics of scale.

3.2. Politics of Scale

China has come to be the world's "paradigmatic infrastructural state" (Bach 2016), where funding and controlling infrastructure is a core mechanism of state power. The national rail system exemplifies this imaginary both nationally and abroad. Yet Chinese studies scholars have long understood the Chinese state as internally heterogeneous, with substantial variation between regions and localities (Shue 1990; Remick 2002; Hillman 2010; Shue and Thornton 2017). Yet the balance of power between center and locality has shifted over time. While reform and opening entailed devolving state power downwards to the local level and outward to the market, the central state has also strategically reclaimed power when local governments deviate too far from national guidance (F. Wu 2002; Chien and Gordon 2008). New work suggests that the "local developmental state" (Zhu 2004) or "Chinese-style federalism"

(Montinola, Qian, and Weingast 1995) paradigms of the eighties and nineties is yielding to a resurgent central state that employs regionalization to undermine provincial autonomy (Y. Li and Wu 2012; Chien 2013). Naughton (2014), looking at central budgetary expenditure and revenues, finds an inflection point in 1995. After declining from roughly a third of national GDP in 1978 to a nadir of just over ten percent in 1995, revenue and expenditure has risen to nearly a quarter of GDP in 2012. Tjia (2015)'s detailed study of the course of railway reform notes a similar trajectory: a series of efforts towards decentralization in the nineties, followed by recentralization in the 2000s. Tjia characterizes this as a process of asset-discovery: empowering and incentivizing local railway bureaus just enough to reveal underutilized assets. This may underplay a genuine shift in central-local power balance over the past decades. Rail development bears the strong imprint of central state authority, studies of the Pearl River Delta have shown that local government also plays a key role in the financing and planning of rail infrastructure (X. Jiang and Yeh 2013; Z. Li, Jiang, and Yeh 2014; X. Jiang 2017).

Chinese railways' origins in the turbulence of the early twentieth century has left a lasting impact on their spatial organization. First formed as independent concerns under governmental and private management, the geographical division of China's rail network into a series of Railway Bureaus (铁路局 *tielu ju*) after 1911 has proven an enduring structure to this day (Köll 2019, 59). Railway bureaus, already organized as largely self-sufficient units prior to the war, smoothly transitioned into the *danwei* system established in the 1950s (Köll 2019, 168, 239).

The Ministry of Rail was central to the PRC's national development and national defense strategies, and remained well-funded throughout the Great Leap Forward and

Cultural Revolution. The MOR was charged first with rebuilding China's war-torn rail network and, after 1964, extending it inland (Comtois 1990; Naughton 1988; Meyskens 2015). In 1966, however, a directive empowering railway bureaus and branch bureaus to pursue the revolutionary movement as they saw fit triggered, in branch bureaus[§] like Xuzhou, paroxysms of factionalism and in-fighting that ground traffic to a halt. This, in turn, triggered a recentralization: in 1975 Deng Xiaoping reaffirmed the power of the Ministry to reestablish order. The subsequent intervention at Xuzhou normalized traffic and became a model for Deng's wider 1975 reforms. After Deng's return to power in 1978, authority was once again returned to the Ministry-level administration, and China's railway system entered reform and opening under central control (Köll 2019, 271–79).

The shift to a market economy put demands on the railway system to move increasing numbers of people, commodities and resources at the same moment that the central state was offloading financial responsibility for state-owned enterprises (Bullock, Sondhi, and Amos 2009; Tjia 2015). By 1986, the MOR was fully dependent on its own income to fund expansion and upgrading (Tjia 2015, 86). While remaining under state ownership, decentralization measures devolved substantial power to allocate resources and seek profit to railway bureaus and branch bureaus. The cradle-to-grave system of schools, hospitals, and recreation associations operated by the MOR, were spun off into private enterprises or shifted to other ministries, reducing the 3.4 million strong workforce in 1978 to 2.5 million in 2000 (Tjia 2015, 48, 54). Yet despite constant

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[§] Branch bureaus (铁路分局 *tielu fenju*) formed a layer of management underneath the railway bureaus and above station sections. An unclear division of asset control and financial responsibility between bureau and branch bureau was often blamed for inefficient allocation of resources before and after reform.

promises of reform, core transport operations resisted substantive change. When the rail system repeatedly failed to turn a profit between 1993 and 1997, pressure for reform mounted (Tjia 2015, 68, 86). Under pressure from pro-decentralization institutions like the World Bank and internal pressure from the State Council, the MOR proposed a series of decentralizing reforms between 2000 and 2003 (Tjia 2015, 86–88).

Under the leadership of Liu Zhijun, Minister of Railways from 2003 to 2011, however, the MOR went the opposite direction. Liu pushed for bold new development, and in 2004, the State Council approved the Mid to Long Range Network Plan (MLRNP), which laid out a sweeping plan for the reform and expansion of the Chinese rail system (Ministry of Railways 铁道部 2004). Under this new "Great Leap-style" development, privatization and decentralization came second to meeting the needs of national economic and social development (Tjia 2015, Ch 5; Köll 2019, 285). Seemingly unlimited loans paid for the construction of the massive new HSR passenger network while keeping ticket prices at state-mandated lows; freight transport, particularly of coal, received a similar combination of infrastructural upgrades and subsidized pricing (Tjia 2015, Ch 5).

Liu Zhijun's tenure saw the MOR consolidate power upwards: Liu abolished the branch bureau in 2005, de-distancing the Ministry from ground-level operations (Tjia 2015, 54–55). The MOR also consolidated power vis a vis other central ministries such as the National Development and Reform Commission, which officially has authorization power over certain large railway projects (X. Jiang 2017, 63–64). Liu Zhijun's scandal-ridden downfall, due to spiraling corruption investigations and multiple high profile rail accidents between 2008 and 2011 (Tjia 2015, 111; see also Osnos 2012), provided an

opening for the central state to bring the Ministry to heel. The 2013 dissolution of the Ministry into China Railway Corporation and the State Railway Administration did little to change day to day operations, but saw the absorption of the national railway grid into Xi Jinping's One Belt One Road initiative (Tjia 2015, 111–12).

The shifting trajectory of China's national rail administration has shaped the development of the XRL in key ways. Originating in the decentralization of the nineties, the course of the XRL in the time since shows the discursive and material work of re-imagining that took a regional project and subsumed it within a re-invigorated national network.

3.2.1. Rail and State Scale in Guangdong

While the XRL itself has not received much scholarly attention, political geographers examining other rail projects in the Pearl River Delta shed invaluable light on the regional context (C. Yang 2006). The politics of scale in the Pearl River Delta are informed by the Canton-Beijing tensions discussed above. Reform and opening's experiments with decentralization and privatization reached their apex in Guangdong. In 1993, the Guangzhou Railway Bureau was the first and to date only of China's eighteen railway bureaus to incorporate. In 1996, the Guangshen Railway Company, first corporatized in 1984, was re-incorporated as a joint stock company, the only Chinese railway traded on the Shanghai, Hong Kong, and New York stock exchanges (Tjia 2015, 50–55). The Guangshen Railway Company was a pioneer of service diversification, branching out into shopping malls and touring agencies (Tjia 2015, 122). The Guangshen company was a technological pioneer as well, putting into service a foreign-made HSR train in 1998, well before HSR became a national priority.

As the MOR became cash-strapped in the late nineties, it increasingly relied on joint-ventures with provincial and local government to finance new lines (X. Jiang 2017, 62–65). Guangdong province, as one of China's wealthiest provinces, was an eager partner; and in 2003 joined with the MOR to expedite the construction of the Pearl River Delta Inter-City Rail System (hereafter: PRD ICRS). Wholly distinct from the XRL, the PRD ICRS is a commuter rail network linking the cities of the Pearl River Delta. Under the initial agreement between Guangdong and the MOR, the network was to be financed 50% by each party. This agreement quickly fell apart, kicking off a decades-long intra-scalar struggle between Guangdong and the MOR, entangling not just PRD municipal governments but the formidable National Development and Reform Commission (X. Jiang and Yeh 2013; Z. Li, Jiang, and Yeh 2014). This struggle demonstrates that even under post-2000s recentralization, the Ministry of Railways still must gain the cooperation of local state actors to finance and secure land for new lines.

Guangdong wanted to build the network under its own control, both to reduce costs and to avoid the unfair treatment other joint-venture participants received from MOR. The MOR sought maintaining its monopoly on rail construction and operation, as well as ensure the ICRS's technical compatibility with the national network. Local governments control the land necessary for construction and for raising funds, while national-level ministries monopolize legitimacy and technical capacity. Within this struggle, narratives of scale are a central strategic tool: national ministries, provinces and cities all aim to align their goals within a compelling scalar imaginary. Thus, in their attempts to shut out the MOR, Guangdong emphasized the regional character of the ICRS (X. Jiang 2017, 68). Scale is also constructed through material means: the MOR's

emphasis on national standards marshaled technology in service of the national scale (X. Jiang 2017, 62–63, 68). The struggle over control of the project produces multiple scale both materially and discursively, yet as Jiang notes, actors at every scale framed their arguments within an overarching concern for the "national" interest (2017, 71). The PRC ICRS, a rail project with an explicitly regional focus, makes for an illuminating counterpoint to the XRL. Like the ICRS, the trajectory of the XRL evidences both the discursive dominance of the national imaginary, and a central state increasingly effective in exerting administrative control over the regional scale. The trajectory of the Canton-Kowloon Direct train also illustrates the XRL's project's dramatic shift towards the center.

3.3. The History of the Canton-Kowloon Direct Train

Cantonese railways were relatively successful in the late Qing and early Republic; contrasting interests between officials, merchants and foreign agents that hampered rail development elsewhere in China were more harmoniously aligned in the Pearl River Delta, with multiple functioning and profitable lines by 1911 (Jin 1977). The Canton-Hankou line was redeemed from an American company in 1905, and opened an initial section to Shaoguan in 1915 (Jin 1977, 93). A 1904 line to Sanshui connected the western bank of the delta, and the Canton-Kowloon line, completed in 1911, connected the east. Originally part of an 1898 British concession (C.-K. Leung 1980, 173), the section between Guangzhou and the border was redeemed via loan—backed by the Chinese government, but provided by the Hong Kong colonial administration (Tsin 2002, 134). Managed by the Canton-Kowloon Railway in the north and the Kowloon-Canton Railway in the south, "direct" service initially required trains to pause and switch engines

at the border before continuing on (NFDSB 2018-09-21a). After 1949, the line was separated altogether—not just administratively and legally, but physically. While never recognized as an international border by mainland officials, the distinct customs and immigration regimes on each side nonetheless led to the adoption of procedures and infrastructure like that of an international border. Prior to 1979, cross-boundary passengers had to disembark, walk 100 meters across a small bridge and pass through customs. A two-hour wait for the second train made the trip an all-day affair (Vogel 1990, 60, 338). Mail trains resumed service in 1954, and freight in 1973, but direct passenger service did not resume until 1979 (NFDSB 2018-09-21a). Passengers passed through mainland customs in Liuhua Station—renamed Guangzhou East Station after 1996—and passed through Hong Kong customs at Hung Hom Station in Kowloon (*Guangzhou Daily* 2019-04-04).

In the 80s and 90s, the Guangzhou-Hong Kong line was a conduit not just for passengers and goods between Hong Kong and the mainland, but social norms and technology as well. The border control unit in Guangzhou was quick to adopt computerized procedures to handle the high throughflow (*Guangzhou Daily* 2019-04-04). Under guidance from their Hong Kong counterparts, the mainland section adopted new uniforms for stewards, including skirts, berets and make-up (NFDSB 2018-09-21a). This model of feminized service work was in stark contrast to the proletarian "iron women" promoted by the Mao-era party-state (Otis 2011, 38–43). Flowing the other direction, China Railway's speed ups during the nineties compressed the Guangzhou-Hong Kong journey from roughly three hours—the same as in 1911—to less than two (NFDSB 2019-09-21a, Bullock, Sondhi, and Amos 2009, 38). Handover, in 1997, was marked

materially by the rail system by the opening of new direct services from Beijing and Shanghai to Hong Kong (NFDSB 2018-09-21a).

Circulation between Hong Kong and the mainland is not simply a question of transportation infrastructure, however, but of creating solutions to the novel challenges of the region's unique boundary regime. Because the boundary is an ostensibly a domestic demarcation but in practice an international border, Chinese customs and immigration do not accept either PRC or Hong Kong passports or national identification as appropriate travel documents. The drive to develop a substitute that would allow Hongkongers and mainlanders to navigate the mainland-Hong Kong boundary was led by the Guangdong provincial government, working in concert with Guangzhou and Shenzhen officials. The resulting system of passes and permits is complex, and fundamentally asymmetrical. Hong Kong residents have enjoyed greater freedom to move across the boundary than mainlanders since PRC immigration began to crack down on border crossing in 1950s (Breitung 2002). The Ministry of Public Security introduced single entry passes for residents of Hong Kong and Macau in August of 1951, only a few months after banning entry and exit. Single entry passes proved unwieldly and in 1956, the "Hong Kong Macau Compatriot Home Return Introduction Booklet" was introduced: effective for three months, it eased the burden on travelers and immigration personnel alike.

In 1979, the Ministry of Public Security delegated authority to the Guangdong Provincial Public Security Department to issue a multi-entry Home Return Permit (港澳同胞回乡证 *Gang Ao Tongbao Huixiangzheng*) valid for three years, extended to 10 years in 1981. A small booklet similar in size and function to a passport, the Home Return Permit allowed Hongkongers relatively unfettered access to the mainland,

whether for business or to visit relatives. The Home Return Permit remained the standard, familiar document for cross-boundary travelers through the 80s and 90s, though a major computerization reform in 1988 eased administration bottlenecks.

However, the limitations inherent to the booklet format became clear as cross-boundary travel became routinized. The limited number of pages rendered the ten-year validity irrelevant, as frequent travelers could fill a booklet in a matter of months. In 1999, a new "card-style" identification was introduced: officially called the Mainland Travel Permit for Hong Kong and Macao Residents (港澳居民来往内地通行证 *Gang Ao Jumin Laiwang Neidi Tongxingzheng*), it is still often referred to as a Home Return Permit in regional newspapers. In this article, I refer to it as the Mainland Travel Permit or MTP. Stamped with the logo of the Guangdong Public Security Department, the card-style permit allowed Hongkongers stamp-free entry to the mainland, further reducing friction at the border.

Mainlanders wishing to travel to Hong Kong, on the other hand, were far more constrained. While travel has become easier, at every stage the options available to mainlanders have been sharply limited in comparison to those of Hongkongers. From the closing of the border in 1951 up to 1979, there was no formal document allowing mainlanders to legally travel to Hong Kong. After the first Special Economic Zones were established in the Pearl River Delta, however, the need for some official travel between Hong Kong and the mainland quickly became pressing. Travel permits issued under the direction of Guangdong Public Security Department, were initially limited to official business. Gradually, these documents were adopted to allow mainlanders to visit relatives in Hong Kong as part of tour groups. In 1986, the Exit-Entry Permit for Travelling to and

from Hong Kong and Macau (往来港澳通行证 *Wanglai Gang Ao Tongxingzheng*) gained official status from the Ministry of Public Security. Unofficially, they are called Two Way Permits (双程证 *Shuangchengzheng*) to distinguish them from the One Way Permits[**] issued to permanent migrants. Throughout the 80s and 90s, Two Way Permits consisted of a two-page booklet—the size of a passport, but only usable once (China News Service 2017-06-30). While at Handover in 1997, the mainland-Hong Kong "border" was redefined as an internal "boundary," in terms of migration and transportation infrastructure the transformation was symbolic only: in all other respects, the boundary continued to function as it had before (Breitung 2002, 1760). While substantive changes to infrastructure and procedures of cross-boundary travel gradually eased bottlenecks in the following decade and a half, the boundary regime remained restrictive and deeply asymmetrical through the early 2010s.

4. The Express Railway Link

4.1. Building the XRL's Transportation Infrastructure

The idea of a high-speed passenger-dedicated rail line between Guangzhou and Hong Kong dates back to the late nineties, almost two decades prior to the XRL's grand opening in 2018. In its earliest iteration, the link was a regional if not urban project put forward by regional actors, advocated for in terms of its local impact. Only later was the line incorporated technologically and symbolically into China's national HSR system. At the 1999 Fortune Global Forum in Shanghai, the enterprising mayor of Guangzhou

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[**] One Way Permits, initially limited to 75 per day in 1980, gradually rose to 150 per day in 1995 and have not risen since. They do not play a major role in cross-boundary traffic (Breitung 2002, 1754).

pitched the Chief Executive of Hong Kong on the construction of a direct, high-speed line between their cities, superseding the direct train that had operated since 1979. He proposed using magnetic levitation technology to connect the Pearl River Delta's two largest cities in a mere half hour. When introducing his plan in 2002, the mayor claimed the Sui-Gang Maglev (穗 *Sui*, meaning Guangzhou and 港 *Gang*, meaning Hong Kong) would deliver a constant stream of visitors to Disneyland Hong Kong, then nearing groundbreaking (*Xinkuai Bao* 2002-03-27). In Hong Kong, the Executive Council had approved the Railway Development Strategy 2000, which included, alongside a wide-ranging expansion urban and peri-urban commuter lines, a "Regional Express Line" to the Hung Hom border crossing ("Railway Development Strategy 2000" 2000). The maglev proposal was studied by the Hong Kong Government, along with the Shenzhen city government and the Ministry of Railways, culminating in a Hong Kong proposal to the mainland in late 2001.

This regional leadership was shortlived. Within a few years, the central state began to bring the regional express into line with country-wide rail infrastructure planning. Following consultation with mainland rail experts, the maglev proposal was set aside in favor of conventional high-speed rail (NFRB 2002-12-15). This decision was driven in part by the high costs and unreliability of maglev technology, but also by compatibility concerns. Building around a distinct technological infrastructure would have kept the line, now dubbed the Guang-Shen-Gang Expressway, cut off from the vast expanse of already existing track (NFDSB 2018-09-23b). As would prove more significant, it would also have kept the line cut off from vast expanse of not yet built high-speed rail track which the next decade would bring.

In 2004, the State Council approved the Mid to Long Range Network Plan (hereafter: MLRNP), which laid out a sweeping plan for the reform and expansion of the Chinese rail system. Chief among these changes was the introduction of a national high-speed passenger-dedicated network, today known as HSR (Bullock, Sondhi, and Amos 2009, 74–76). The 2004 MLRNP envisioned a network of four vertical and four horizontal lines to link China's major urban centers, as well as intercity lines to provide accessibility within China's three great urban agglomerations: Beijing-Tianjin, the Yangtze Delta, and the Pearl River Delta. One of the proposed north-south lines ran from Beijing to Shenzhen, but strikingly did not include any mention of a continuation into the Hong Kong (MLRNP 2004). In the 2016-2025 Mid to Long Range Plan, approved by the State Council in 2016, Hong Kong finally made an appearance as the terminus of the Beijing-Hong Kong line.

Despite their conceptual unity, the construction of the Guangzhou-Shenzhen and the Shenzhen-Hong Kong sections of the line occurred over different timelines. The mainland section, funded half by China Railway and half by the Guangdong provincial government (NFDSB 2018-09-21a) in a bid to accelerate rail development to alleviate bottlenecks in the Pearl River Delta (X. Jiang 2017, 65) started construction in 2005 and was completed in 2011. Connecting two of China's largest urban centers, it quickly became one of China's busiest lines. The Hong Kong section moved far more slowly. The Hong Kong section was not approved until 2010, when it was scheduled to be completed in 2015. Hounded by unanticipated challenges ranging from civil protest (Xia 2016) to flooded tunnels (A. Lee and Ng 2014), the line finally opened in September of 2018, three years late and HK$19.5 billion over budget.

4.2. Setting up the XRL's Migration Infrastructure

As illustrated by the history of the Guangzhou-Kowloon Direct train, the infrastructure of track and train are only half of the problem. Establishing an infrastructure of documents and procedures to render residents on both sides of the boundary legible to the government of the other is a challenge all its own. As the XRL project inched closer to reality, the migration infrastructure of the Pearl River Delta continued to smooth away points of friction in the flows of people through the region. While the experience of Hongkongers changed in substantive ways, the most dramatic transformations benefitted mainlanders: not only did the frustrating process of obtaining and renewing Two-Way Permits become significantly more convenient, the permits became available to a much wider swathe of the country. While travel between the interior and Hong Kong remains asymmetrical, the gap has diminished.

The card-style Mainland Travel Permit introduced in 1999 provided a high degree of mobility to Hongkongers throughout the 2010s. A second generation Mainland Travel Permit was introduced in 2013. In addition to introducing new safety and anti-forgery features, the new card is compliant with global electronic travel document standards. Crucially, the second generation card stores individuals' biometric data, allowing Hongkongers to swipe through customs and avoid waiting in long lines (NFDSB 2014-04-18). The physical change coincided with a significant and telling jurisdictional shift. The second-generation MTPs are issued by the national-level Ministry of Public Security, reclaiming authority delegated to the Guangdong department in 1979. While still administered through the Guangdong department's offices, the logo of the Guangdong Public Security Department has been replaced by the Ministry's.

Access to Hong Kong for mainlanders has always been more limited. The Two-Way Permit, initially restricted to use by Guangdong residents, has gradually been extended and regularized to the rest of China (Breitung 2002; 2009, 115–16). In 2002, a multiple-use Two-Way Permit became readily available to mainlanders for the first time. Valid for ten years, these passport-like booklets do not on their own allow their holders to travel: mainlanders must apply for visa-like exit endorsements on a short term visits to Hong Kong. As with visas, different endorsements are issued for specific purposes, ranging from group sightseeing to work and study to family reunions, each requiring a separate application process and supplementary materials (Breitung 2002, 1754). The point of greatest friction, however, was that endorsement applications had to be made through the Public Security office of the Permit holder's city of residency. As a result, sojourners from other provinces living in the PRD could not apply to travel to Hong Kong or Macau without first making a trip back "home"—to the city where they officially resided. Even mainlanders living in Hong Kong and married to Hong Kong residents had to make this pilgrimage. Until 2019, Chinese citizens residing in Hong Kong were forced to return to their city of official residence once every three months to apply for a new endorsement, a process that could take weeks (NFDSB 2017-01-19).

Exit endorsements for individual leisure travel became possible in 2003 with the introduction of the individual traveler scheme (Breitung 2009, 116). It began small: initially, only residents of four cities in the Pearl River Delta could apply. The scheme quickly expanded: by the end of 2004, all the cities in Guangdong province as well as Beijing, Shanghai and major cities in the Yangtze River Delta and Fujian province were included. Gradually expanded between 2003 and 2007, eligibility remains limited to

residents of 49 cities (Hong Kong Tourism Office 2019). Including a city in every province excepting Gansu, Heilongjiang, Inner Mongolia, Ningxia, Qinghai, Shaanxi, Shanxi, Tibet or Xinjiang provinces, the individual traveler scheme today includes approximately 200 million mainlanders: mostly wealthy, mostly coastal, mostly Han, all urban.

In 2012, China's immigration service began to relax the regulations requiring mainlanders to apply for Two-way Permits only in their city of registered residence: beginning in major cities like Beijing, students, workers and spouses of registered residents were allowed to apply without having to return home. Gradually expanded to registered residents and to more cities, in April of 2019 the policy was expanded to the entire country, easing a long-standing bottleneck (Xinhua 2019-03-26). In the Pearl River Delta today, a long-term sojourner with a registration in, for example, Hangzhou, can apply for a new permit at the Public Security Bureau near where they actually live, and then get an exit endorsement in the rail station on their way to Hong Kong—an experience that nears, if not quite meets, the ease with which a Hong Kong resident can travel to the mainland.

In 2014, the Ministry of Public Security began trials in Guangdong of a new Two-Way Permit patterned after the new card-style Mainland Travel Permit. After more than a year of watching Hongkongers sweeping through automated customs and immigration procedures, the new card was eagerly anticipated by Pearl River Delta residents (NFDSB 2014-04-2; 2014-04-18). While still requiring a separate exit endorsement, the new card-style Two-Way Permits ease the process considerably. The new card is embedded with thermally reactive ink on the reverse side; allowing the same card to be re-used without

running out of pages. Moreover, the new technology enables automated stations to issue endorsements in minutes rather than weeks; these stations are now available not just at public security offices, but inside PRD rail stations (*Guangzhou Daily* 2019-05-24).

As mainland rail infrastructure and the citizenship-based infrastructure with which it is increasingly interdependent, has developed over the past decades, the experiences of mainlanders and Hongkongers have shifted. In 2000, the MTP allowed Hongkongers an unhindered freedom of movement in the mainland that even mainlanders did not possess; today the MTP is increasingly out of sync with mainland transportation and migration infrastructure. Mainlanders' *shenfenzheng* is seamlessly integrated into China Railway's online ticketing infrastructure through WeChat smartphone apps. Passengers relying on the MTP, in contrast, constantly encounter ill-defined limits and unpredictable interruptions in their ability to buy tickets. When the XRL opened in 2018, the MTP was supposed to be compatible with China Railway's online ticketing system; yet some Hongkongers found themselves unable to purchase tickets, a shortcoming that some attribute to institutional neglect and others to secret blacklists (You and Su 2018). The MTP still unevenly integrated into automated ticketing infrastructure outside the Pearl River Delta; in most of China, MTP holders must buy tickets at a ticket office in the same way that the holder of a foreign passport does (NFDSB 2014-07-23).

Recently MTP holders have encountered a new problem: ticket agents refusing to issue tickets at the window. When issuing new MTPs after their ten-year expiration, the PSB incremented the final digits from 00 to 01. *Shenfenzheng* identification numbers are fixed, and the ticketing infrastructure interpreted the mismatch between the card and the ticket office's information as an error (NFDSB 2017-01-19). Frustration with ticketing

issues contributes to a growing sense of alienation among MTP-dependent Hongkongers. As *shenfenzheng*-based identification verification proliferated though China's online and governmental infrastructures in the 2010s, issues caused by MTP incompatibility have compounded. The MTP serves as a de facto *shenfenzheng* for Hongkongers living and working on the mainland, used to open bank accounts and register at hotels. This has led to Hongkongers encountering financial issues, as changing MTP ID number cause conflicts with bank records, rendering them unable to pay rent or engage in online commerce (NFDSB 2014-07-23). These proliferating points of frictions led official delegations from Hong Kong and Macau to call in 2017 for the MTP be made fully compatible with mainland transportation and migration infrastructure so that city residents can "enjoy the unhindered, 'just a pause and then go' experience of mainland citizens' *shenfenzheng*" (NFDSB 2017-01-19).

For mainlanders, the emergent infrastructure has gradually reduced friction both within the mainland and in traveling to Hong Kong. For Hongkongers, the experience has been more mixed: the card-style MTP makes travel easier, but the shortcomings of the MTP as standard identification have become quite stark. The changes to migration infrastructure discussed so far have greatly transformed the function of the XRL without directly impinging upon its operation. The introduction of the new joint checkpoint at West Kowloon Station, however, brings the infrastructure of the new line and the new migration infrastructure together.

4.3. "One Place, Two Inspections"

Ostensibly a straightforward proposal to simplify immigration clearance, the West Kowloon Station joint checkpoint has become a central point of contention for anti-XRL

activism and narratives of mainland reintegration. The joint checkpoint (一地两检 *yidi liangjian*, literally "one place, two inspections") integrates mainland and Hong Kong immigration and customs side by side in the heart of Kowloon. While a similar arrangement in Shenzhen, under which travelers leaving Hong Kong cleared customs in Shenzhen Bay Port had existed for a decade, the proposal to set up a joint checkpoint on Hong Kong territory provoked considerable popular and legal opposition (N. Sun 2017). To understand the transformation of cross-boundary relations the joint checkpoint represents, it is useful to look back at the customs arrangements employed for previous direct trains between the mainland and Hong Kong.

The direct Guangzhou-Hong Kong service that opened in 1979 ran from Guangzhou Station and Hung Hom Station in Kowloon. Travelers passed through Chinese border inspection in Liuhua Station, a temporary checkpoint erected next to the station proper before boarding the nonstop train to Hung Hom. In 1996, the terminus of the direct service and the border inspection moved to Guangzhou East Station. In Guangzhou East, the customs and immigration process went through a number of refinements, introducing an early self-service station in 2009. With the new biometric MTP introduced in 2012, passing through immigration and customs take as little as 15 seconds. On the Hong Kong side, passengers disembark before passing through Hong Kong customs and entering the city.

When the direct services between Beijing-Kowloon and Shanghai-Kowloon began in 1997, however, this model of customs clearance posed challenges. Unlike the nonstop Guangzhou-Hong Kong service, these services stopped at multiple stations between their origin and destination. Passengers boarding in Beijing or Shanghai might

disembark before reaching Hong Kong, and other passengers might board. Instead, the entire train stopped at Changping Station in Dongguan so passengers could pass through customs before crossing the border into Hong Kong (Xinhua 2017-05-27). This tiresome process greatly inconvenienced passengers: “Back then,” recalled one old passenger, “my right hand pulling my child, my left hand dragging my luggage, standing in line for an hour—it was truly time-consuming and exhausting” (Xinhua 2017-05-27). A short-lived experiment took place in 2003, attempting a new procedure to conduct the customs clearance on board the train between Guangzhou and Shenzhen. A month later, both Beijing and Shanghai trains converted to a direct-only service: passengers passed through customs in Beijing West and Shanghai Stations, and were no longer allowed to board or disembark at intervening stations (Xinhua 2017-05-27; China News Service 2003-10-03).

This history illustrates the difficulties of integrating Hong Kong-bound routes into the mainland grid. Every station with service to Hong Kong had to become, in function, an international customs and immigration port—unless, somehow, passengers could pass through mainland customs and immigration procedures after disembarking in Kowloon. Such a model had already been put into practice just to the north. A joint checkpoint in Shenzhen was proposed during the seventh Guangdong-Hong Kong Cooperation Joint Meeting in 2004, with strong support from the Hong Kong General Chamber of Commerce (NFRB 2004-08-05). Opened in 2007, the joint checkpoint houses Hong Kong customs on territory leased from the mainland, allowing passengers to pass through both sets of entry and exit procedures in the same building.

The West Kowloon joint checkpoint appears to simply reverse the arrangement. Yet in the eyes of anti-XRL Hongkongers, it sets a dangerous precedent in conceding

Hong Kong territory to mainland control for the first time in over one hundred years (N. Sun 2017). They argue that allowing mainland Chinese laws to be applied within the city violates Article 18 of Hong Kong's Basic Law (Siu and Chung 2017). In order for Chinese customs to operate in Kowloon, part of the station, along with the platform and carriages, must be placed under the jurisdiction of mainland laws, an arrangement ruled constitutional by the Hong Kong High Court in 2018 (Lum 2018). Anxiety around mainland influence is evident in controversies about "hidden spaces" discovered in plans for West Kowloon Station (Su 2018); even the announcement of free station wifi made some suspect eavesdropping (Yau 2018). Reports that passengers attempting to enter Hong Kong had been intercepted by mainland immigration were greeted with concern in Hong Kong (Su and Chung 2019), while being hailed as triumphs of policing in the pages of the *Southern Metropolitan* (NFDSB 2019-01-04).

Where the previous rail connections between the mainland and Hong Kong functioned by pushing mainland customs further from the border and turning domestic carriages into pseudo-international space, establishing the joint checkpoint in Hong Kong achieved the opposite, annexing what had been Hong Kong space into the Chinese HSR network. The term "one place, two inspections" echoes in form the "one country, two systems" principle that protects Hong Kong autonomy while functioning to blur the distinctions between Hong Kong and mainland territory. Yet as a practical measure the increased convenience is evident, at least in the pages of mainland media. In the pages of the *Southern Metropolitan* and the *Southern Daily*, the discussion of the joint checkpoint focuses on the details of its function, how it affects how people move through the region and the new possibilities it offers to residents and businesses. In the *People's Daily*, the

joint checkpoint receives a relatively brief and abstracted description, focusing on how the new model will further unify the Greater Bay Area's marketplace (RMRB 2018-01-31).

The West Kowloon Station joint checkpoint illustrates how the transportation and migration infrastructure involved in making the XRL project a reality is enlisted in different scalar imaginaries. While the role that the XRL has played in the scalar imaginaries of Hong Kong residents is significant (Xia 2016), in the following section I focus in on how the XRL has been imagined on the other side of the boundary. The infrastructure discussed above has been enlisted in national and regional media to produce imaginaries of China and of the Pearl River Delta. While the origins of the XRL suggest a distinctly regional—even urban—imaginary, by the time of its opening in 2018 the Pearl River Delta had itself been re-imagined as an integral part of a larger national unit.

5. From Pearl River Delta to the Greater Bay Area

The opening of the XRL in 2018 was narrated, in both regional and national media, as a significant step towards the creation of the "Guangdong Hong Kong Macau Greater Bay Area" (粤港澳大湾区 *Yue-Gang-Ao Dawanqu*). In articles on the joint checkpoint, the new Two-Way Permits and Mainland Travel Permits, new ticketing machines and customs technology, the two-decade process of construction is portrayed as the long-awaited realization of the Greater Bay Area. Yet the very idea of the Greater Bay Area, now the all-encompassing new imaginary for the future development of the Pearl River Delta, was at that time only two years old. Prior to 2016, the term was rarely used to refer to the Pearl River Delta; most often called the PRD (珠三角 *Zhu Sanjiao*),

sometimes the term Greater Pearl River Delta (泛珠三角 *Fan Zhu Sanjiao*) was used to include Hong Kong and Macau. The Greater Bay Area gained official imprimatur and official definition in 2016, after appearing in the 13th Five Year Plan. It has rapidly become the default toponym for the region in both national and regional media, imagined to be not just an interlinked economy, but a fully integrated cultural and political entity in the lives of residents.

Greater Bay Area has been adopted by provincial, urban and the special autonomous region governments alike, though each places emphasis on different aspects. Even as they adopt the Greater Bay Area in official planning documents and newspaper reports, Cantonese narratives of the Greater Bay Area retain a scalar imaginary distinct from that of Beijing. In narratives originating in Beijing, accounts of the Greater Bay Area situate it firmly within the nation, emphasizing its unique role within the broader Chinese economy, alongside the Yangtze River Delta and greater Beijing. A key function of the Greater Bay Area is to employ mechanisms of work, study, housing, and entrepreneurship to integrate Hong Kong and Macau into the national community. Within the region, accounts of the Greater Bay Area emphasize its importance to everyday life and global economic competitiveness; it is imagined as a self-contained entity, put alongside global economic and cultural powerhouses like the greater Tokyo or San Francisco bay areas. Yet differences between these scalar imaginaries are seen more in the margin, in what is emphasized, than in actual difference in vision.

5.1. The Greater Bay Area as Seen from Beijing

In the pages of the *People's Daily*, the spatial imaginary the Greater Bay Area produces is related to a very different scale. From the vantage of Beijing, the completion

of the XRL is not simply or primarily a matter of integrating Hong Kong into the regional economy, but of returning Hong Kong compatriots to "the embrace of the motherland" (RMRB 2018-08-30). While contributing to the economic and technological development of neighboring cities like Shenzhen and Dongguan, it is also a matter of developing Hong Kong's relationship with Shanghai and other mainland cities—aligning Hong Kong's strengths with the country's needs. While the regional papers mention that the West Kowloon station will provide long distance service to 44 mainland cities, the *People's Daily* informs its readers that these cities include Beijing, Shanghai, Shijiazhuang, Zhengzhou, Wuhan, Changsha, Hangzhou, Fuzhou, Xiamen, Shantou, Guiyang, Guilin, and Kunming (RMRB 2018-09-22a). The *People's Daily* also tends to locate agency at the national scale. In one *People's Daily* article, it is the mainland network that is the grammatical subject, extending into Hong Kong rather than Hong Kong joining the national network (RMRB 2018-09-22b). Articles such as this frame HSR's integrative power as benefitting Hong Kong's development, but subsume the city's benefit within overall national development (RMRB 2018-09-22b). When acknowledging the region's global connections, the *People's Daily* echoes the language of the 13th Five Year Plan in situating the Greater Bay Area within the One Belt, One Road national strategy of global development (RMRB 2018-08-30). The Greater Bay Area becomes a site through which China can project power beyond its borders.

The analyses of the XRL's transportation and migration infrastructure operate at an analytical distance from practical concerns of life in the Greater Bay Area. When covering the joint checkpoint, the bulk of attention is given to the process of passing the necessary laws at the National People's Congress (RMRB 2017-11-01). The advantages

of the joint checkpoint are explained in terms of its role in economic and social development, with relatively little attention to their mundane practicalities (RMRB 2018-01-31). The destination it puts in Hongkongers's grasp is Guilin in Guangxi province, rather than Guangzhou or Shenzhen (RMRB 2018-09-22b). The concrete details of station design receive limited attention (RMRB 2018 09-05]. New policies to ease the "vexatious" process of getting travel documents address the Two-Way Permit—discussed under its official name rather than the regional appellation—alongside passports and immigration permits for travel to Taiwan (RMRB 2018-04-27).

As in the regional papers, the XRL's impact on the flows of people within the Greater Bay Area figures prominently in the pages of the *People's Daily* (RMRB 2018-01-31). Where the regional papers examine in detail the experiences of residents living and working across the boundary, however, for the *People's Daily* the impact of the XRL is summarized by the nameless passengers who cried out "The joint checkpoint eases the people's livelihoods!" (RMRB 2018-09-24). While re-iterating the "one-hour life circle" discourse of easy living, work and travel, the limitless future prospects offered by strengthening ties with mainland cities and entering the embrace of the motherland is the greatest opportunity brought by the XRL (RMRB 2018-08-30).

Of particular interest is the impact of the Greater Bay Area on the young people of Hong Kong. The XRL and other transportation projects help young people understand the mainland better and offer more choices for future life-styles (RMRB 2018-10-29). According to the *People's Daily*, "For the young people of Hong Kong, the construction of the Greater Bay Area is a surging wave; if you seize the opportunity, you have a chance to realize your dreams in the future" (RMRB 2019-03-06). The *People's Daily*

articles touch briefly upon projects to facilitate the engagement of the young people of Hong Kong entrepreneurship opportunities on the mainland (RMRB 2018-08-30).

As seen from Beijing, the Greater Bay Area is instrumental, a mechanism for advancing national goals of economic growth and pulling Hong Kong into the mainland. Making it easier for Hongkongers to live, work, study and travel in the neighboring cities matters because it normalizes circulation between Hong Kong and the mainland (RMRB 2018-09-22b). The XRL has become part of the HSR network not just in terms of infrastructural standards or ticketing but in terms of its role in producing a space of national circulation.

5.1.1 Cantonese Perspectives on the Greater Bay Area

The two regional papers have much more specific points of view on the XRL, and focus their attention on its impact on the conduct of everyday life in the Greater Bay Area rather than on grand nationalist narratives. One striking characteristic of the *Southern Metropolitan* is its use of maps to describe railway development; the most striking aspect of these maps is their consistently regional scale. The 48 *Southern Metropolitan* articles collected for this research included ten maps, whereas none of the *People's Daily* or *Southern Daily* articles had a map. Of the maps in the *Southern Metropolitan*, the majority (7) were of the Pearl River Delta area, two showed the entirety of Guangdong province, and only one—a schematic drawing of rail routes—was at the scale of China proper.

Within the delta, where the articles position the reader spatially and culturally tends towards a much higher degree of specificity. The audience for regional newspapers is sometimes framed as Chinese citizens, but articles also refer to "Guangdongers" (老广

Lao Guang, NFDSB 2014-04-18, 2014-05-20b). An article that describes the journey to Hong Kong as 19 minutes, for example, concretely locates the reader in Shenzhen (NFDSB 2018-09-24). Other articles discuss how the XRL's arrival will transform smaller towns or districts like Humen (NFDSB 2018-09-12) and Nansha (NFDSB 2018-09-27). The *Southern Metropolitan* most consistently, however, writes for a Guangzhou audience interested in the flow of Hongkongers into Guangzhou for business. From Guangzhou or Shenzhen, the XRL creates a new spatial imaginary at the regional scale: the XRL serves as a new link in the gradually cohering "one-hour life circle" the residents of the Greater Bay Area has long been dreaming of. In the words of a man living in Shenzhen and working in Hong Kong, "in the future, it doesn't matter where work is, as long as it's in the Greater Bay Area. The HSR's 'one-hour life circle' will completely change our traditional understanding of physical distance" (NFRB 2018-10-04). This spatial imaginary, however, is situated within a sophisticated understanding of the logistical realities of circulating through the Greater Bay Area, including both new conveniences and continued challenges.

Unlike the ten thousand-foot view offered in the pages of the *People's Daily*, the regional papers examine the intricacies of the XRL's transportation and migration infrastructure at the ground level. New travel documents, application procedures and customs processes all receive detailed coverage. Rather than adopt the official administrative term "Mainland Travel Permit," the *Southern Metropolitan* writes about the Home Return Permit (NFDSB 2014-07-23, 2017-01-19). Moreover, the regional papers reflect a complicated affective relationship with this infrastructure: residents are frustrated by delays and mismanagement, and elated by new conveniences and options.

Reporters eagerly describe the new comforts and conveniences of the new carriages and the speedy flows of the new stations and customs areas. The journeys described and imagined take place within a regional context.

The experiences of young Hongkongers is discussed in the *People's Daily* also appears repeatedly in the pages of the regional papers. One article in the *Southern Metropolitan* follows a government program to attract young Hong Kong entrepreneurs to Guangzhou: one woman talks about how troubles encountered using a MTP to buy tickets drove her to get a mainland residence permit; another person mentions how mainlander *suzhi* (素质 human quality) has improved in recent years (NFDSB 2018-10-18]. In the *Southern Daily*, the concrete specificities of the "one-hour life circle" are explored through the story of a man who lives in Shenzhen to save money while commuting daily to work in Hong Kong (NFRB 2018-10-04). Not only do the experiences of Greater Bay Area residents receive more detailed treatment in regional media, these accounts are focused on the mundane details of how everyday life is lived by those circulating along the XRL between Hong Kong and the mainland. Life in the Greater Bay Area is framed in terms of cost and convenience, not within a discourse of national reunification.

While referencing the same Greater Bay Area imaginary, national and regional media place their emphasis on different aspects of the imaginary, and highlight different spatial relations. The Greater Bay Area participates in a national narrative of political and cultural reunion as well as a regional narrative of economic and social fluidity. Yet the imaginaries have yet to fully align: despite efforts to draw its youth into the Greater Bay Area imaginary, the role of Hong Kong remains unsettled. While the story of the XRL

project is largely one of increasing mainland dominance, there is one site where Hong Kong's section of the HSR network remains markedly different: in the physical design of its HSR carriages.

The inauguration of the XRL was also the inauguration of a new trainset, the first HSR trains to be owned and operated by the MTR, Hong Kong's publicly-owned mass transit operator. While built by mainland companies and technologically compatible with mainland track, these trains were given a new name and a distinctive red and orange livery, symbolically distancing them from the white and blue trains operated by China Railway. Selected via public competition, the name Vibrant Express (动感号 *Donggan Hao*) combines the characters for feeling and movement; written in the other order, "Vibrant Express" forms a verb meaning "to be moved to emotion." While mainland media frames the emotions moved by the train as nationalist sentiment (RMRB 2018-09-24), the name is bland enough to be interpreted in any number of ways. The compartment design is equally accommodating to multiple meanings: interiors have been designed to be compatible with the expectations of both mainland and Hong Kong travelers. Signage is in Simplified and Traditional Chinese characters, along with English, and voice announcements are in Mandarin, Cantonese, and English. On the technological dimension, the seat-side electrical sockets have both mainland and Hong Kong compatible plugs (China National Radio 2018-09-22; NFDSB 2018-09-24).

As discussed above, the naming conventions of mainland HSR trains have been closely aligned with the party-state's narratives of Chinese nationalism; the clear symbolic distinctions made between China Railway and MTR trains suggest a hesitance to import the nationalistic and party-centric connotations of the "Harmony" and "Fuxing"

trainsets. Despite being built to the same technological specifications as Harmony trains, it was felt that Hong Kong's trains had to be distinct. The Vibrant Express, however, is only one of many train services running along the XRL. The MTR operates services along the Guangzhou-Hong Kong route, but China Railway branch bureaus operate services to Shenzhen, Guangzhou and 42 other mainland cities. West Kowloon Station sees no shortage of white and blue trains.

6. Conclusion

The development of the XRL took place during a period of dramatic shifts in the balance of power between the center and localities. Born at a moment of Cantonese autonomy and power, the XRL was first conceived of as a regional project serving regional needs. However, in the decades since, the Ministry of Railways has re-centralized authority over rail construction and embarked on an ambitious plan of HSR development at the national scale. HSR introduced a novel sort of transportation infrastructure across all of China, integrating cities to a degree unimaginable in prior decades; during the same period, the integration of the *shenfenzheng*-based real name system into rail ticketing linked mobility and citizenship to a new extent. Parallel developments in the PRD's idiosyncratic migration infrastructure shifted authority to the national level and reduced the asymmetry in access to cross-boundary travel. The sum impact of these changes was to re-imagine the XRL as an integral part of a national-scale vision even as it remains part of an ostensibly regional imaginary. The discourses circulating through regional and national media concerning the opening of the XRL in 2018 show how the Greater Bay Area articulated regional and national imaginaries in a largely, albeit not entirely, harmonious way.

This article shows that the infrastructure itself figures prominently in scalar imaginaries: the presence of particular railway connections, customs and immigration processes, and the layout of stations are the substance out of which national and regional visions are made. The XRL contributes towards a national imaginary because it is built to a national standard, connects to a national network, and depends upon national identification regimes. For the national Party, it is part of a narrative of national rejuvenation and (re-)integration. It contributes to a regional imaginary because it enables everyday life to take place within a particular regional context and serves a regional community. For Cantonese in the Pearl River Delta, it is a narrative of economic and social interlinkage.

Yet the role of infrastructure is not limited to contributing raw material to state media discourses. The affective relations to infrastructure that emerge through everyday use are themselves productive of discursive meaning. Whether the experience of travel is smooth and comfortable and so reduces the friction between one place and another, or is troublesome and alienating and so erects boundaries between them, is part of how regions come to be imagined at different scales. This capacity of infrastructure to shape perceptions of belonging and community is precisely why it is of interest to nation-builders: how the youth of Hong Kong experience the Greater Bay Area matters to Beijing precisely because Beijing aims to draw them into the national imaginary, into the China Dream.

This concept of infrastructure suggests the importance of a "thickness" to national belonging. Nationalist discourse, in the form of patriotic education or flag-waving parades, is the most legible dimension of a phenomenon which is rooted in everyday life;

without these roots nationalism has little grip on the people whom it claims as its own. Infrastructure is one institution through which nation-ness can permeate society, shaping the circulations which define the boundaries of a community. Infrastructure comes to define the contours of everyday life in ways which then lend nationalist discourse an intuitive, visceral naturalness. Yet in the end, infrastructure is a text whose meaning is interpreted not only by official discourses but by users—a text which, unlike official narratives, is embedded in the fabric of their everyday lives.

This article confines its analysis to mainland accounts of the XRL, yet a "thick" infrastructural approach to scalar imaginaries also suggests a novel approach to the mainland-Hong Kong relationship. While a superficial reading of the XRL's infrastructure suggests a simple relation between increased flows and increased connection, a more nuanced engagement shows how increased flows can create fracture. The technical specificities of rail infrastructure are a text to be interpreted within a particular discursive tradition and situated material context, and in the Pearl River Delta, Hongkongers have a radically different history than mainlanders. Cho argues that the Mainland Travel Permit, a document which defines Hongkongers as Chinese at the same time that it denies them citizenship, functions as a migration infrastructure that reinforces the disjunction between home and citizenship (2017, 189). When mainland citizenship or residency offered few advantages and numerous limitations in comparison to a Mainland Travel Permit, there was little incentive for Hongkongers to want one. As national standards emerged around HSR and the *shenfenzheng*, Hongkongers were excluded from a more and more substantive set of privileges in the mainland, heightening a sense of alienation rather than ameliorating it. In line with Cho's analysis, this article's

examination of how the MTP is tightly woven into the XRL's infrastructure suggests that the entire line may function as an instrument of alienation for Hongkongers, enabling smooth flows through places that cannot be their home.

Bridge

This chapter contributes a sustained attention to the discursive construction of Chinese rail's nation-building force, and departs from this dissertation's focus on the national scale to analyze how the region is imagined within and distinct from the nation. More than just a material infrastructure, Chinese rail shapes nation-ness through its mobilization within state discourses of national revitalization. It is also mobilized within discourses of regional economic development that do not contradict but do not quite correspond with the national imaginary. While the capacity of rail infrastructure to restructure social space and create new senses of belonging is shared among mainland newspapers, the specific things and practices which enable rail travel figure in different ways. This empirical analysis of XRL imaginaries sets up the next chapter's more theoretically rich engagement with conceptions of state and nation. Rather than debate whether these abstractions are real or reified imaginaries, the next chapter argues they are best understood as internally heterogenous assemblages, linked through the intermediary of infrastructure. As the XRL shows, infrastructure creates both coherence and fracture: what appears straightforwardly unifying from a national vantage induces fracture at more local scales.

CHAPTER VI

BETWEEN NATION AND STATE: BOUNDARY OBJECTS, INFRASTRUCTURES AND COMMUNITIES OF PRACTICE IN THE CHINESE RAIL SYSTEM

Introduction

This article is a sympathetic critique of a certain scholarly stance regarding the nation and the state. Evident across a disparate body of scholarship, this stance is marked by a radical ontological skepticism concerning their object of study. They hold that nation or state does not exist—or at least does not exist in the sense that it is assumed to exist. Rather than real entities in the world, nation and state are understood as *reifications*—discursive categories that are mistaken for real (Brubaker, 2004; Calhoun, 1997; Mitchell, 1991). This analytic frame introduces a split between the realm in which nation and state can be spoken of as coherent entities, and their "reality," which is quite a bit messier.

My critique is sympathetic because this skeptical stance has been enormously productive for theorizations of nation and state. Refusing to take the nation for granted has enabled scholars to chart out a heterogeneous set of discursive practices and communities within the ostensibly national unit (Bhabha, 1990; Duara, 1995; Sparke, 1998). For scholars of the state, reframing the territorial state as a discursive "effect" has augured an investigation of a complex tangle of material assemblages (Joyce and Mukerji, 2017; Painter, 2006, 2010). Through myriad case studies of heterogeneity and porosity within nation and state, this literature has qualitatively transformed how we understand these entities. It is no longer tenable to assume the existence of a singular national community undivided by fractures along lines of gender, race, class or region; it

is no longer tenable to speak of a unitary state exerting absolute power over a perfectly delineated space.

Despite its insight, however, this stance risks obscuring the ways in which nation and state are nonetheless coherent material things. First, there are real, substantive ways in which in order to exist nations and states do propagate sameness and do establish boundaries. These mechanisms of nation-building and state-making are far messier than the discourse of their perfectly bounded homogeneity allows, yet they cannot be fully separated. A nation without any means of shared imagining is not a community in even the most illusory of ways. A second consequence of conceiving of the nation and state's material coherence as reified illusions is that it obscures the ways in which difference can be *constitutive* of coherence. Heterogeneity and porosity are not necessarily failures of nation-building and state-making, irregularities to be tolerated or errors not yet fixed. They may, in fact, be instrumental to their overall coherence.

I observed the tangled relation between discursive and material coherence firsthand during fieldwork investigating how the state rail system manifests Chinese-ness at a national scale. A signature achievement of the world's "paradigmatic infrastructural state" (Bach, 2016), China's rail infrastructure is a vast infrastructure of people and technologies enabling circulation at a novel speed and scale, knitting the country together both discursively and materially. While it appears monolithic from a distance, an examination of the everyday realities of rail travel reveal a multitude of fractures. Passengers from different backgrounds use different practices to navigate the same system of stations and carriages, generating divergent understandings of the rail system. Even examining a single component of the system, such as the ubiquitous hot water taps,

reveals both coherence and fracture. These fractures are not simply failures of homogenization and territorialization but are a mechanism for managing tensions within China's ridership.

In this article I argue for a conceptualization of nation and state that conceives of them as real entities that are nonetheless internally heterogeneous. I develop this argument in three steps. First, I critique the literature of nation and state to show how "reification" has been plucked from its roots in dialectical materialism (Lukács, 2009) to argue against the reality of nation and state. Second, I examine how a parallel debate about the reality of scientific fact has played out within science and technology studies (STS). Instead of abandoning fact, STS scholars have proposed an alternative conception that that situates its reality in terms of the strength of its entanglement within a network of material-discursive, socio-technical things (Barad, 2007; Haraway, 1988; Latour, 1993, 1999). Third, by drawing on the concept of boundary objects (Star and Griesemer, 1989), I show how infrastructure functions as a network of things which entangle nation and state, and thereby give them reality. I then turn to Chinese rail infrastructure for a concrete example of how boundary objects knit together infrastructure and communities of practice at the scale of nation and state while also tolerating—and even producing—substantive forms of fracture.

The conception of infrastructure as a simultaneously social and material thing has its origins in STS, but is proving a productive site for both state theory and the political geography of the nation. Infrastructures, as "matter that enables the movement of other matter" (Larkin, 2013: 329), are both objects of study in their own right and a means to examine the other processes which they mobilize. Infrastructure allows scholars to get at

the concrete specificities of how communities of practice (Bowker and Star, 1999; de Laet and Mol, 2000; Star, 1999), national communities (Akhter, 2015; Jones and Merriman, 2012; Kezer, 2009; Merriman and Jones, 2016), and states (Guldi, 2012; Harvey, 2012; Scott, 1998) come into existence.

Centering material infrastructure facilitates the investigation of real coherence and fracture at two levels. First, it illuminates coherence and fracture internal to the national community, and within the state apparatus. Drinking hot water is simultaneously understood as a part of being Chinese, but is also as an old-fashioned habit rejected by many Chinese travelers. The hot water tap was historically part of a particular state-led nation-building project, but is now seen as an impediment to new state development priorities. These fractures within nation and state are real, manifesting and driving struggles over the organization of state space and the character of the national community. Their mere presence, however, does not necessarily threaten the coherence of Chinese-ness.

Second, centering infrastructure offers insight into the close, yet fraught relation between nation and state. While few geographers would make the mistake of equating the two (Agnew, 1994), the question of how or why they are entangled remains under-analyzed (Agnew, 2010; Antonsich, 2009). I argue infrastructures like rail are a point of articulation between nation and state: states build them, and nations inhabit them. While both are made real through the same infrastructure, however, each has a distinct relation with that infrastructure: to the state, it is a means of control over a territory; to the nation, it is a landscape in which it dwells. As a "boundary infrastructure," rail binds nation and state and also marks the boundary between them. This indirect relation helps explain how

large-scale infrastructural projects can shape national sentiment in powerful ways contrary to what the state intended (Akhter, 2015; Goswami, 2004; Guldi, 2012; Mukerji, 2010). The study of infrastructure reveals it to be not just a passive, transparent medium for nation and state but a crucial site of their production.

Situating reification in theories of nation and state

Skepticism concerning the reality of nation and state emerged within the context of the “cultural turn”, a wave of scholarship dissatisfied with positivist social theory (Özkırımlı, 2010; Steinmetz, 1999). Critics argued that an empiricist emphasis on objective measurement and abstract model-building neglected vital subjective and discursive dimensions of social phenomena. Moreover, they argued, these “objective” theories unreflexively internalized and reproduced a discourse steeped in racist, sexist and other oppressive power relations. The cultural turn challenged scholars to not only attend to subjective and discursive dimensions of their object of study but also to critique the assumptions pervasive within their inherited theories. This critique took different forms within theorization of nation and of state.

For the study of nation, Benedict Anderson’s *Imagined Communities* (1983) marked an inflection point in the transition from predominantly “structural and materialist” analyses towards “cultural studies” approaches (Eley and Suny, 1996). Before Anderson, “modernist” theorists of the nation explained it in the context of large-scale sociohistorical processes such as capitalism, industrialization, and modernization (Gellner, 1983; Hobsbawm, 1990; Özkırımlı, 2010). Anderson, in contrast, examined the discursive and affective aspects of nationalism: what did the nation *feel* like? *Imagined Communities* became “the genealogical locus of contemporary subjectivist approaches to

nationalism" (Goswami, 2002: 771). Subjectivist approaches reveal the nation as a far more heterogeneous realm than portrayed by the modernists, riddled with fractures along race, gender and class lines (Ahmad, 1994; Bhabha, 1990; Chatterjee, 1993; Hall, 1997; Yuval-Davis, 1997). Anderson's emphasis on "imagined-ness" centered questions of narrative, identity and meaning. In light of the heterogeneity thereby unveiled, however, it took on a second meaning. If the nation appears homogenous, yet in reality holds multitudes of differing subjectivities, then homogeneity only exists in the realm of discourse. The nation transforms from an imagined to an imaginary community.

While political geography has held on to a sense of the nation as a coherent entity, it has nonetheless tended to increasingly situate it in a representational register (Jones and Fowler, 2007). Billig (1995)'s banal nationalism framework has inspired many political geographers to engage with the nation's mundane manifestations (Koch and Paasi, 2016). Contrasted with the "hot" nationalism of marches and sloganeering, the banal of weather maps and postage stamps has provided an entry point into the spatial, temporal, and gendered unevenness of national feeling (Christian et al., 2016; Jones and Merriman, 2009). Nonetheless, even studies of material things like money (Penrose, 2011), stamps (Raento and Brunn, 2005), or road signs (Jones and Merriman, 2009) center their analysis on how the thing represents, rather than realizes, the nation.

The most theoretically explicit effort to conceptualize the nation as a purely or predominantly discursive thing builds on reification theory (Brubaker, 2004; Calhoun, 2007; Özkırımlı, 2010). Their objections to taking nations as "real, substantial things-in-the-world" echo the critics of the cultural turn: by mistaking "categories of ethnopolitical practice" constructed by "ethnopolitical entrepreneurs" for objective units of analysis,

scholars have been “unintentionally doubling or reinforcing the reification of ethnic groups” (Brubaker, 2004: 8, 10). For Calhoun, “nations are constituted largely by the claims themselves, by the way of talking and thinking and acting that relies on these sorts of claims to produce collective identity” (1997: 5). Özkırımlı refrains from defining the nation as anything other than “a symbol with multiple meanings” in order to avoid falling “into the trap of ‘reification’” (2010: 206). Brubaker hastens to add: “to rethink…nationhood along these lines is in no way to dispute their reality” (Brubaker, 2004: 11; cf. Calhoun, 2007: 27; Özkırımlı, 2010: 208). Yet describing the reality of nation solely in terms of discourse constitutes a significant narrowing in scope from modernist theories of nation—indeed, a retreat from Anderson’s own formulation.

Imagined Communities joins “objective” and “subjective” dimensions of the nation in a single analytic, rather than discarding the former in favor of the latter. The emergent material and technological infrastructure of “print-capitalism” is as central to Anderson’s thesis as the “imagined community” it co-constitutes. Books and newspapers are not just a means for the dissemination of symbolic representations but material objects in their own right. Among the first “modern-style, mass-produced industrial commodit[ies]”, print media accomplished their effects through everyday ubiquity, driving the development of national vernaculars as an “unselfconscious, pragmatic” process rather than deliberate nation-building (Anderson, 1983: 34; 42). This assemblage produces coherence—the extraordinary “mass ceremony” of reading the newspaper—and fracture—the creole nationalisms of the new world. For Anderson, the discourse of nation is inextricably coupled with the material infrastructure.

With the state, reification has narrowed the scope of theory in a different way. Rather than highlighting myriad heterogeneous subjectivities, reification is employed to highlight heterogeneous material processes within the seemingly unitary state. While on the whole the study of the state "remained relatively aloof" from the debates of the cultural turn, others met its challenge head on (Steinmetz, 1999: 3). Following Abrams (1988), Timothy Mitchell critiques the abstract ideal of a clearly bounded state, but correctly seeks "not just to reject such metaphysics, but to explain how it has been possible to produce this practical yet ghost-like effect" (1991: 91). Mitchell explains the appearance of the state as "'structure' that somehow stands apart from individuals, precedes them, and contains and gives a framework to their lives" as a "structural effect" emerging from the proliferation of Foucauldian discipline (1999: 89). He analogizes the state-idea to the "artificial machine" of the modern military unit: its unity is "an effect produced by the organized partitioning of space, the regular distribution of bodies, exact timing, the coordination of movement, the combining of elements, and endless repetition" (Mitchell, 1999: 89). What appear as boundaries of the state are "lines drawn *internally*, within the network of institutional mechanisms" and mundane sociomaterial practices of the society within which the state manifests (Mitchell, 1991: 90, emphasis in original). While the appearance of coherence and unity is empirically observable, it is not evidence of a real entity.

In geography, Mitchell's framework has been taken up to theorize the "heterogeneous, constructed, porous, uneven, processual and relational character" of state practice (Painter, 2006: 754). Territory's existence is re-conceptualized as an effect of specific "networked socio-technical practices" (Painter, 2010: 1093). Painter's reading of

state-effect pushes beyond Mitchell to posit an essential ontological distinction between the state and its constitutive materials:

> "When I apply for a passport identifying me as a citizen of a state, the passport, the office and the officials that issue it, and the border post through which it allows me to pass all exist. However, the state in whose name they function is neither an aggregation of these elements, nor a separate reality behind them, but a symbolic resource on which they draw to produce their effects." (Painter, 2006: 758)

Further rejecting the coherence of the state, Joyce and Mukerji theorize the state as a "state of things," a material assemblage "held together, sometimes very uncertainly, at particular key sites and through the actions of key actors and processes, human and nonhuman" (2017: 1). Denying the state any coherent essence or intention, they describe states as "experiments in logistical power": a concept that, like "state effect", locates the coherence of the state in an ontologically ambiguous elsewhere. On one hand, defining the materialities of state as heterogeneous conceals the ways in which key sites of state power "from transport infrastructures to post offices to legal archives" produce material coherence (Joyce and Mukerji, 2017: 2). On the other, these theories pay little attention to the myriad, contradictory discourses of state.

Critiques of reification necessary work to de-naturalize the state and unveil the concrete specificities of the heterogeneous practices and materiality within. Yet if lack of a homogenous essence or clear boundaries is sufficient evidence to undermine a thing's reality, it is unclear what limits this critique to the state. Returning to Mitchell's analogy: if an army merely "seems" to be more than the sum of its individual soldiers, then why does a soldier not merely "seem" to be more than the sum of their constitutive muscles and organs, due to the coordinated and regularized practices through which they are combined? Conversely, if we grant that a soldier or a passport exists, then on what

grounds is nation or state reduced to a mere symbolic "effect"? Critiques of reification end up producing the two-tiered ontology they are intended to circumvent.

Reification theory as formulated in Marxist analysis wasn't meant to deny objective reality to ideas—quite the opposite. Reification describes the "phantom objectivity" of the commodity-form, "an autonomy that seems so strictly rational and all-embracing as to conceal every trace of its fundamental nature: the relation between people" (Lukács, 2009: 32). Similarly, nation, state and nation-state are forms which despite being essentially social nonetheless take on the appearance of being natural and inevitable. Just as Marx sought to peel away the mystifications of the commodity-form to reveal the social relations within, so too do scholars of nation and state seek to denaturalize the commonsense assumptions of their objects of analysis. Yet here they part ways. For Marx, the reification of the commodity form is not a subjective experience that exists in contradiction to objective conditions. Rather, it is a subjective experience that emerges *within* objective conditions (Marx, 1990: 164–67). People encounter commodities as objective because an entire "world of objects and the relations between things" has already come into being; "only in this context does the reification produced by commodity relations assume decisive importance both for the objective evolution of society and for the stance adopted by [people] towards it" (Lukács, 2009: 34).

Lefebvre develops the concept of reification within his critique of the state: states reify space, rendering it "abstract." Abstract space appears as "a floating 'medium', a simple abstraction, a 'pure' form" that precedes, and serves as a container for, everything else (1991: 82). This creates an "illusion of transparency" (Brenner and Elden, 2009: 371; Lefebvre, 1991: 51, 27) which allows for both "continuous, rational economic

calculation" and "comprehensive, encompassing control" of a sort unattainable within other modes of social space (Brenner and Elden, 2009: 358). This appearance of homogeneity is inseparable from a material transformation: "the national territory" is "a physical space, mapped, modified, transformed by the networks, circuits and flows that are established within it" (Lefebvre, 2009: 224). This space is inextricable from the state: the state "binds itself to space" in an act of mutually constitutive production (Lefebvre, 2009: 224, 228). This novel form of space is joined to nation as well, bound as it is by language and by a certain system of social behaviors, which "rarely articulated as such because they seem obvious—acquire a quasi-natural self-evidence in everyday life and common sense" (Lefebvre, 2009: 224–5).

Despite its apparent totality, abstract space remains fractured in two distinct ways: first, abstraction parcelizes space into economically functional units (Lefebvre, 2009: 233). This sort of fracture is not a failure to abstract space, but an essential element. Other fractures are more threatening:

> "[…] in addition to being a means of production [the space thus produced] is also a means of control, and hence of domination, of power; *yet that, as such, it escapes in part from those who would make use of it.* The social and political (state) forces which engendered this space now seek, but fail, to master it completely." (Lefebvre, 1991: 26 emphasis mine)

Conceiving of abstract space as a reification is not a matter of denying their reality. Rather, it allows Lefebvre to inquire into the conditions of their emergence while remaining sensitive to their internal fractures. Frustratingly, Lefebvre rarely addresses the concrete mechanisms through which state space emerges and fractures. However, the examples he does give are evocative: roads and rails, waterways and airways; infrastructures that enable circulation (Lefebvre, 2009: 237–9).

Marx argues for a recognition of the commodity as socially constructed: contingent upon a particular history and set of social relations, but equally contingent on taking up and reshaping objective material conditions. Marx critiques reification's seeming inevitability and necessity as illusory. In critiques of nation and state, reification has been re-interpreted as implying their existence is illusory. As a consequence, these theories produce a two-tier ontology in which something—be it "cultural idiom" (Brubaker, 2004: 10–11) or "barbed wire" (Mitchell, 1991: 94–95)—is *realer* than nation or state. For nation, the "objective" material conditions which are constitutive of coherent national communities have fallen to the wayside. For state, the sharp ontological divide between the state-idea and the state-effect excludes consideration of either coherent materialities or fractured discourses. In the following section I show how theoretical tools developed within STS can provide a framework for reconceptualizing the ontology of nation and state in order to fully grasp their "objective" materiality as well as their "subjective" discourses, their overall coherence as well as their internal fractures.

From boundary objects to boundary infrastructure

The cultural turn also influenced the ontological approach that emerged within science and technology studies. Some of the hottest debates of the era—what Latour (1999) terms the Science Wars—centered on STS research into the social dimensions of the "hard" sciences. Paralleling Marx's critique of commodities, STS scholars contended that facts are real not because they exist prior to and beyond society, but because they are constructed out of social relations between things. This conception of scientific fact as social is equally alien to both radical social constructionism and defenders of scientific objectivity. Rather, the aim is "to have simultaneously an account of radical historical

contingency for all knowledge claims and knowing subjects, a critical practice for recognizing our own 'semiotic technologies' for making meanings, and a no-nonsense commitment to faithful accounts of a 'real' world, one that can be at least partially shared" (Haraway, 1988: 579).

In place of a firm boundary between reified categories and real objects of analysis, a co-productive ontology recognizes that "the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it" (Jasanoff, 2004: 2). This relational ontology requires a new epistemology that situates knowledge within the world: reality is perceived not from an objective "view from nowhere", but through mediation: the creation of particular, situated networks of "semiotic-material technology to link meanings and bodies" (Haraway, 1988: 585). Facts become infrastructural, an assemblage of things naturalized into omnipresence and transparency through standardized practice (Star, 1999: 380–83). Within this relational ontology, the heterogeneity and porosity of things is accepted as a matter of course; knowledge is not a matter of describing ideal types but of investigating the conditions under which things emerge and the relations which stabilize them.

Star proposes that "boundary objects" play a critical role in this processes of stabilization. Where Latour's actor-network theory (1999) describes the stabilization of facts through hierarchy, boundary objects do not assume a singular authority. Reflecting a more ecological view, the circulation of boundary objects forms a coherent network "for doing things together" without consensus on what is being done (Star, 2010: 602). Boundary objects are "plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across

sites" (Star and Griesemer, 1989: 393). A boundary object does not mark an external boundary: rather, it constitutes a boundary *inside* the network, a fracture integral to the network's coherence. The boundary object mediates between and even instrumentalizes distinct communities of practice in service of the ecological whole.

While the boundary object's capacity to afford different interpretations to different communities is essential to keeping things moving, that ambiguity remains dangerous. The network can tolerate only so much indeterminacy. Standards are necessary for defining which elements of the object are abstracted and which remain concrete, ensuring the objects' translatability (Star and Griesemer, 1989: 393). Boundary objects exist in constant tension, material/discursive things caught between "concrete and abstract, specific and general, conventionalized and customized" (Star and Griesemer, 1989: 408). Boundary objects exist at the conceptual scope where their balance between plasticity and stability is functional: scientific specimens are boundary objects, yet so are entire repositories and even "the state of California" (Star and Griesemer, 1989: 409). As their use becomes naturalized within a community, however, boundary objects change. Their ontological plasticity is constrained; diverging interpretations and uses must be brought into line or end up marginalized (Star, 2010: 605). The balance between coherence and fracture shifts as institutions expand, and boundary objects transform into something new: infrastructure (Bowker and Star, 1999; Star, 1999).

Infrastructure is discursive and social: it is learned as part of membership, shapes and is shaped by the conventions of a community of practice, and standardizes interactions across time and space (Star, 1999). As Lefebvre notes, once established it fades into background. Infrastructure is material and technical: it is embedded in the built

environment, gives concrete form to technical standards, and re-inscribes contingent material histories both when is built and then continuously as it breaks and is repaired. Boundary infrastructure envelops the communities it binds, becoming environment. Even at the scale of infrastructure, however, communities of practice remain plural: “any working infrastructure serves multiple communities of practice simultaneously” (Bowker and Star, 1999: 313). Boundary infrastructure preserves the boundary object’s juxtaposition of coherence and fracture, “allowing for local variation together with sufficient consistent structure to allow for the full array of bureaucratic tools to be applied” (Bowker and Star, 1999: 313).

While maintaining coherence across wider scopes necessitates increasing standardization, homogeneity is never absolute. Fracture is displaced but never eliminated. The boundary object framework offers a way of conceptualizing the complex interplay of coherence and fracture that persist even within highly organized infrastructural networks. This perspective offers a way for theorists of nation and state to investigate the manifold roles played by infrastructure not just within nation and state, but between them.

Infrastructure at the boundary of nation and state

Research on the nation-building and state-making capacity of infrastructure has been lent force by a renewed interest in the material (Kelly, 2014; Squire, 2015; Whatmore, 2006). Others pushing against the limitations of representational approaches draw inspiration from feminist work on performance and embodiment (Hyndman, 2004; Mayer, 2004), and work on affect and non-representational theory (Dittmer, 2014; Müller, 2015). This return to material things investigates how “their physical and

technical properties and […] their 'role' in a network" constitute forms of everyday practice deeply embedded within a national culture (Edensor, 2002: 106). Drawing on STS work (Law and Mol, 2001), Merriman and Jones (2009, 2016) sketch out an approach to nation and infrastructure foregrounding affect, practice, and materiality. Material things are not passive bearers of state symbolism but constitute more-than-human assemblages capable of actively "cultivating or delimiting state power" (2014: 215).

De Laet and Mol (2000)'s study of the Zimbabwean Bush Pump traces a line from state-funded infrastructure to community- and nation-building. For de Laet and Mol, the boundaries of the pump are hard to pin down: does it include the pump head alone, or the concrete headworks it is installed on? What of the bore hole it sits atop? What of the community which uses it and maintains it? Like Mitchell's state, it is difficult to tease out the boundary between it and society. De Laet and Mol describe this as one aspect of the pump's "fluidity". The pump is a boundary object, flowing between communities: to engineers it is a technology, to doctors a promoter of public health, to villagers the center of a community, and to the state a nation-builder. A functioning pump gives villages "a shape, a size and a materiality that they did not have before" (2000: 245), and without the engagement of the local community, "the well is dead" (quoted in de Laet and Mol, 2000: 234). The pump's own boundaries are fluid: its design documents specify what it is not, offering adaptations to diverse local conditions. This fluidity allows it to knit diverse locales together. At the state scale, the pump produces a national community: not simply a set of separate installations, the Zimbabwe Bush Pump is a national standard, each pump undergirded by a state-backed system of production and maintenance. "As it helps

to distribute clean water, it also builds the nation…while nation-building may involve writing a shared history, fostering a common cultural imagery or promoting a standard language, in Zimbabwe it also has to do with developing an infrastructure for water" (de Laet and Mol, 2000: 235).

This approach to infrastructure, emphasizing the role of state-backed infrastructure in cohering national community, has been documented both in the rhetoric of nation-builders and in the scholarship. In early republican Turkey, nationalists wrote that rail "weaves an iron web across the homeland" (quoted in Kezer, 2009: 511). Scholars of rail and roads have investigated how they serve to homogenize space and create community (Harvey, 2012; Schueler, 2009; Verstraete, 2002). Dams have often been central to nation-building enterprises (Kaika, 2005; Swyngedouw, 2014). On a more mundane level, others have shown how the material culture of everyday life shapes national identity and spaces, through media consumption (Foster, 2002), driving practices (Edensor, 2004), and technoscientific imaginaries (Hecht, 2009; Jasanoff and Kim, 2015).

Yet if material things have the power to build nations and states, then they have the power to undermine them as well. Merriman and Jones (2016) give the example of the Severn Bridge. The bridge unites Wales and England even as it demarcates between them: a literal boundary object, it means different things from different perspectives. Kezer (2009) shows how rail infrastructure and urban design made manifest nationalist visions of an interconnected, homogenous Turkey even as they become sites of friction. Hydrological infrastructure such as dams, sewers and drinking water systems have often been built to demonstrate or reinforce state power, only to end up exposing the state to

novel risks (Kaika, 2005; Meehan, 2014; Swyngedouw, 2014). In Pakistan, the Tarbela dam served to fragment not just the national community but state space as well (Akhter, 2015).

In other cases infrastructure serves to produce coherence along one dimension while producing fractures along others. Goswami (2004)'s analysis of Indian rail shows how colonialist carriage design created a novel pan-Indian unity even as it entrenched novel class distinctions and re-inscribed gendered differences. This contrariness is not confined to the colonial or post-colonial context: Guldi (2012)'s history of roads in nineteenth-century Britain shows how the consolidation and standardization of road construction united localities in a successful rebellion against the metropole. Infrastructure shapes communities of practice, to be sure, but not necessarily the communities that were expected or intended.

These studies suggest that infrastructure plays a subtle but central role in the production of nation and state. Thinking infrastructure as boundary objects allows us to remain sensitive to imbrications of coherence and fracture within nation and state, and also between them: infrastructure articulates between nation and state without rendering them synonymous. State-sponsored national languages may offer a shared medium of communication through which anti-government critiques then circulate; a bridge may enable economic circulation while also becoming symbolic of ethno-territorial distinction. In the following section I present the Chinese rail system as a case study wherein the boundary object framework allows for the fine-grained analysis of new and lingering fractures within what appears to be a monolithic whole.

The Chinese rail system as boundary infrastructure

The Chinese rail network functions as a boundary infrastructure which both binds together and fractures national community and state territory. Shaped by the state and inhabited by the nation, this ubiquitous transportation network is a common point of reference, a shared experience across China, even as how it is experienced varies dramatically. The history of rail in China traces a fractious course, illustrating infrastructure's complex role in bolstering and undercutting nation and state. During the first half of the twentieth century, rail was at the heart of a rapidly cohering nationalist discourse even as its material form was profoundly fractured (Leung, 1980; Liu, 1999; Wang et al., 2009). In 1949, the PRC inherited a badly damaged, incoherent and unbalanced rail network (Leung, 1980). Between 1949 and 1978 new track increased connectivity and extended rail's reach, forming a coherent national network for the first time (Comtois, 1990). The Third Front (1965-71) saw the rail network push into China's mountainous interior, integrating territories into national industrial and transportation networks (Meyskens, 2015; Naughton, 1988).

The system has undergone continued change since reform and opening. Rail was pivotal for China's economic boom in the eighties and nineties, delivering migrants to coastal factories. A series of speed ups beginning in the nineties increased average speeds by 40% between 1995 and 2007 (Bullock et al., 2009: 37). Despite rapid expansion, the passenger network has been continuously running at capacity; passenger traffic grew at an average of more than 5.5% per year between 2000 and 2013 (Zhou et al., 2014). The emergence of high-speed rail in the mid-2000s has introduced a distinct socio-technological assemblage. HSR led to the construction of new rail lines and stations, the

production of new coaches, and the introduction of new standards for in-station and on-coach service and passenger behavior. The rollout of the real name computerized ticketing system in 2012 and new security measures taken in the wake of terror attacks on rail stations in 2014 have rendered the state a tangible presence in rail travel and rail space. The rail system's ongoing development was a source of national pride among my respondents, though they were also quick to point out its shortcomings. Student discounts make it an attractive option for students; more reliable than air in terms of speed and price, it remains competitive for job-hunter and business travelers as well. It remains a central means through which Chinese people experience China.

To illustrate how wide-ranging transformations of rail infrastructure relate to nation and state, here I focus on the hot water tap. Accessible in every station and carriage within the Chinese rail system, the hot water tap is a concrete example of how the state shapes the everyday environment in order to shape the national community. The hot water tap shows how such infrastructures produce a coherent national space. The practice of drinking hot water is prevalent in China. Commonly attributed to the guidance of traditional medicine, the ubiquitous practice of drinking hot water—and crucially, the infrastructure enabling that practice—originates in the early modern Chinese state's nation-building efforts. Nationalists and statesmen decried the poor character of the Chinese population and sought to instill, among other qualities, a 'modern' sense of hygiene (Sigley, 2009). The Kuomintang's 1934 New Life Movement equated trivial details of personal hygiene, including drinking only boiled water, with patriotism, but lacked the logistical power to develop the requisite infrastructure (Lei, 2009). The Patriotic Health Campaign in the fifties to establish public health infrastructure altered

the landscape, making hot water widely and freely available across China (Hesketh and Wei, 1997). The PRC state not only promoted drinking hot water but developed the infrastructure necessary to make the practice part of everyday life, even distributing family-sized thermoses door to door daily (Liu, 2016). Much of this infrastructure remains wide-spread: hot water taps or kettles can be found nearly everywhere in China, and thermoses are a common sight on streets and in workplaces. In rail stations and carriages, hot water taps are often the only freely available drinking water. One index of the ubiquity of the practice: lack of facilities for boiling water ranks among the top complaints for Chinese tourists abroad (Li et al., 2011).

Taken as a boundary object, the hot water tap allows us to trace the transmutation of top-down population governance techniques into a coherent national community of practice. Within the rail system, the homogenous environment afforded by ubiquitous hot water taps enables a distinctive set of traveling practices (see Figure 6.1). Knowing that hot water will be available throughout, passengers plan ahead, carrying refillable thermoses and instant noodles to eat during their potentially days-long journey. This coherence-first narrative, emphasizing the integration of nation and state, captures a real and substantive change in the social and spatial arrangement of Chinese territory. Yet this narrative only captures so much—as fieldwork revealed, the rapid development of the rail network has produced new fractures.

I gathered data on Chinese rail travel practices through seven months of participant observation within the rail system and 20 interviews with rail passengers. The participant observation, drawing on affective and materialist methodologies of infrastructure, covered the territorial breadth of China from Manzhouli in the north to

Sanya in the south, from Khorgos in the west to Mudanjiang in the east. I also rode selected routes repeatedly to build depth. This data guided interviews with travelers of different age, gender, class and regional origin concerning their practices and perceptions of rail travel. Pairing participant observation with interviews combined attention to the material conditions of rail space and to the meanings circulating in and around those spaces.

Figure 6.1. Hot water taps are as elemental to Chinese rail space as restrooms. From left to right, top to bottom: Urumuqi South Station, Beijing Station, Manzhouli Station, Chengdu South Station, Hengyang Station, Nanjing Station, Kunming Station, Guangzhou East Station, Xiamen Station.

The past decades have seen growing differentiation within rail space. First, hot water taps remain ubiquitous, but their use has not. The hot water taps and the rail traveling practices they enabled were well-known to the passengers I interviewed: “Even though most of the time I don’t like to eat instant noodles, I still have this fixed

impression that eating instant noodles and rail travel go together extremely well" (Interview 2). Yet even while acknowledging the norm, a number of respondents defined their own practices against it. "Me, I like to drink cold water. Winter and summer, I always drink cold water—it's my personal habit" (Interview 4). This is possible because today, alongside the freely available hot water taps, a wide-spread commercial food and beverage distribution system has emerged. Convenience stores in every rail station and vendors on every train sell water, soft drinks, and snacks. One older passenger said: "The treat of riding high-speed trains nowadays is, you don't even have to think about what to eat or drink. You don't have to think to bring a boiled egg, bread or that kind of snack. If you want to buy something you can buy it right then. There's no need [to prepare], the train provides everything" (Interview 7).

High-speed rail has circumvented the need for food and water during the journey altogether through sheer speed. The average 500 kilometer trip took almost eleven hours in 1995; in 2007 it took only seven and a quarter (Bullock et al., 2009). At current HSR speeds, it takes less than two. This has radically changed preparations for rail travel: "These days the time you spend on the train is so short.…You don't need any instant noodles" (Interview 15). Consequently, the old tricks of experienced travelers are rendered unnecessary. "Like my mom, she really has a lot of experience: on the train she'll buy a big can of fruit or something, then after she eats the fruit she'll use the can for drinking water. When she gets off the train, she just throws it away. She's clever with things like that, but I don't think it's necessary. For me, it's too much bother" (Interview 1). This is simultaneously a generational and a class dichotomy: the "old" ways of traveling are the same practices are still in wide-spread use on the slow, conventional

trains that serve poorer, peripheral areas. On these trains, even instant noodles pre-packaged in a paper cup are an unnecessary expense for some passengers, who pack their metal bowls and utensils.

The clearest divide within rail space is between the conventional rail network and HSR. The HSR system is being built and operated at a spatial and cultural remove: not only are new HSR stations being built kilometers away from old stations, but in stations like Shanghai Hongqiao and Wuhan, hot water taps stand alongside American-style drinking fountains (Salzman, 2017). In other cities, station management is deliberately working to exclude instant noodles: in Shenzhen, clerks reported they were not allowed to sell noodles at station kiosks, and in Beijing, I found noodles being sold from literally under the counter. Yet other HSR stations, to the contrary, provide specially marked areas for eating instant noodles (see Figure 6.1, lower right).

The bifurcation of rail space is shaped by station design, but also manifests popular dissatisfaction with the conventional rail system and its practices. In interviews, passengers narrated their experiences with the Chinese rail system with a mixture of pride and annoyance: yes, the rail system is a national accomplishment, but it is full of countless frustrations as well. Many of these have to do with the behavior of other passengers: they are too loud, or their food too odiferous. These practices and the poorer, more rural passengers who rely on them, are representative of a chaotic and unpleasant past which both railway management and many passengers are eager to move away from, towards a modern and hygienic future of mineral water and KFC.

The example of the hot water taps reveals a widening gap between different communities of travelers: practices formed in Chinese rail space are being supplemented

and replaced among the young, the wealthy and the urban by practices borrowed from more cosmopolitan modes of conveyance. The emerging two-tier rail network is an adaptation to an emerging two-tier ridership; socio-economic fractures within the national community manifesting as spatial fractures within state infrastructure. Hot water taps and instant noodles aren't unique: other banal boundary objects, such as the capacious and eye-catching "snakeskin" bags favored by migrant workers, also come to mark communal boundaries within rail space (Zhang, 2010). Different communities of rail passengers use the rail system in different ways, and different state institutions adopt different policies on what practices to encourage and deter. Because the rail system serves such a diversity of passengers and incorporates such a vast swathe of state institutions, it becomes a terrain upon which struggles over the nature of nation and state play out. Yet what these disparate factions share is the rail system itself—by orienting themselves in relation to it, it knits them together.

Conclusion

Contemporary theories of nation, state and nation-state take a justifiably wary stance towards their object of study: each produces a reified ideal of unity and homogeneity that far exceeds the reality. Yet while these ideals exceed the real, material transformation of space and community, they nonetheless depend upon it. The boundary object framework provides an approach that does not equate coherence and homogeneity, allowing us to examine the fractured, yet coherent reality of nation and state.

This article makes a timely intervention in the study of contemporary China. Infrastructure is central to the "China Model," yet as Oakes (2019) observes, infrastructure is itself rarely investigated. The case of the Chinese rail system shows how

interlocking networks of hot water taps, thermoses and instant noodles knit rail space together both materially and discursively. Despite the rapid development of automotive and air travel, as well as information and communications technology, the ramifications of their particular materiality are rarely examined in depth (exceptions include Leibold, 2016). China's image as a monolith, ethnically homogenous with a strong central state, has been significantly complicated by studies revealing a heterogeneous ethnic landscape (Gladney, 2004; Mullaney, 2011) and a complex interscalar politics between central and local state actors (Li and Wu, 2012; Xu, 2017). Adopting an infrastructural lens allows for a fine-grained analysis of how this fractured terrain.

More broadly, conceptualizing infrastructure as a sort of pivot between nation and state—fixed along some axes while moving freely along others—illuminates the indirect means through which states shape nations. State projects of nation-building enlist mundane things like hot water thermoses and environments like rail stations to produce certain kinds of citizens. Yet the communities which emerge in those spaces are given meaning by the people who animate them, not the state that designed them. In the case examined here, fractures have been subsumed within a coherent whole. Yet an infrastructural lens is also useful in examining how and why fracture overwhelms, creating break-away nations and dissolving states (Akhter, 2015; Goswami, 2004). Approaching infrastructure as a boundary object between the governed and the governing allows us to move beyond cataloging the differences between nation and state towards a concrete, materialist understanding of how they come to be—and how they don't.

Bridge

This article serves to situate the intellectual project of the dissertation in relation to the broader social science literature. Despite its focus on the minutiae of how nation-ness manifests in bodies and non-human things, this research intends to speak to theories of nationalism and national identity. This article contributes to the dissertation as a whole by introducing the role played by non-human infrastructure in articulating together social structures as a theoretical concept. It also provides empirical findings regarding the history and contemporary usage of hot water infrastructure in rail space. These findings illustrate the core theoretical contribution of this dissertation: that nations are both coherent and fractured entities. This is important context for the next article on social distinctions within rail space. Despite the seemingly unbridgeable gap between different levels of social class, they are nonetheless united through the social spaces in which they signify.

CHAPTER VII

BEING A CHINESE PASSENGER: PRACTICING QUALITY AND CIVILIZATION ON THE RAIL

Introduction

In this article I use the everyday practices of rail travel to investigate the production of social 'quality', or *suzhi* (roughly: 'soo-jer'), in contemporary China. Rail travel has long been a dominant mode of travel in China and continues to grow, with total ridership exceeding 3 billion trips in 2017.[19] Studies of the Chinese rail system from the perspective of passengers, however, have been limited and largely focused on questions of economic decision-making.[20] This article draws on the cultural geographies of mobility and skilled practice to investigate the nature of rail travel in China from an embodied and material perspective. This perspective illuminates how rail travel and the spaces in which it takes place embed and reproduce larger cultural structures—in this case, conceptions of social quality (*suzhi*) and civilized-ness (*wenming*). The stations and carriages of the Chinese rail system, which I term *rail space*, realize these abstract notions in concrete form through the flows of rail travel.

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[19] National Railway Administration, *2017 nian tiedao tongji gongbao [2017 Railway Statistics Bulletin]* (2018); C.Comtois, 'Transport and Territorial Development in China 1949-1985', *Modern Asian Studies* XXIV (1990), pp.777–818; C.-K.Leung, *China*: *Railway Patterns and National Goals* (Chicago, University of Chicago Press, 1980)

[20] N.Zhou, G.Ollivier, R.Bullock and Y.Jin, *High-speed Railways in China: a Look at Traffic* (The World Bank, 2014); C.-S.Chan and J.Yuan, 'Changing Travel Behaviour of High-Speed Rail Passengers in China', *Asia Pacific Journal of Tourism Research XXII* (2017), pp.1221–1237; J.J.Wang, X.Jiang and J.He, 'Spatial Impacts of High-Speed Railways in China: A Total-Travel-Time Approach', *Environment and Planning A: Economy and Space* XLV (2013), pp.2261–2280

While rail travel was conceived from the start as an intrinsically passive activity,[21] recent scholarship in cultural geography and mobility studies argues that, to the contrary, movement is always an actively practiced skill, 'the competent expression of a method' in which even passivity must be competently performed.[22] Rail travel highlights the unavoidable and fraught nature of travel sociability: within the tight confines of the rail carriage, the practices of each passenger constitute the travelling conditions for everyone else. Accordingly, 'together with being a travelling body comes a series of responsibilities to other travelling bodies.'[23] Yet what are those responsibilities, and how are they negotiated? This article examines how on Chinese rail carriages, answers to those questions have become entangled with national-scale debates over proper and civilized behavior, materially reshaping China's rail system in the process.

This article deepens the engagement of geographies of mobility and skilled practice with the production of cultural dimensions of place. Studies of mobility often frame their analysis in universalistic terms of 'passenger,' 'journey,' and 'destination,' leaving the role of specific national, regional, or ethnic cultural context underexamined.[24]

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[21] W.Schivelbusch, The Railway Journey: the Industrialization of Time and Space in the 19th century (Berkeley, University of California Press, 1986), p.54

[22] L.Watts, 'The Art and Craft of Train Travel', *Social & Cultural Geography* IX (2008), p.712; D.Bissell, 'Moving with Others: The Sociality of the Railway Journey' in P.Vannini, ed., *The Cultures of Alternative Mobilities: Routes Less Travelled* (Farnham, UK, Ashgate, 2009), p.67

[23] Bissell, 'Moving with Others', p.68

[24] D.Bissell, *Transit life: how commuting is transforming our cities* (Cambridge, MA, The MIT Press, 2018); J.Jain, 'The Classy Coach Commute', *Journal of Transport Geography* XIX (2011), pp.1017–1022; M.Sheller and J.Urry, 'The New Mobilities Paradigm', *Environment and Planning A* XXXVIII (2006), pp.207–226; Watts, 'The Art and Craft'; L.Watts and J.Urry, 'Moving methods, travelling times', *Environment and Planning D: Society and Space* XXVI (2008), pp.860–874; for note-worthy exceptions, see T.Edensor, *National Identity, Popular Culture and Everyday Life* (Oxford, Berg, 2002); T.Edensor, 'Automobility and National Identity Representation, Geography and Driving Practice', *Theory, Culture & Society* XXI (2004), pp.101–120; P.Vannini, 'The Techne of Making a Ferry: a Non-representational

Suzhi, civilized-ness and the Chinese rail system are situated within a distinctively Chinese discursive and material context.[25] I draw on Tim Ingold's account of the relation between skill, culture and place[26] to argue that rail produces an interlocked topological and territorial 'region' at the scale of the nation—though as this article's account of *suzhi* makes clear, not a singular or homogenous national culture.

This article contributes to the understanding of contemporary China as well. In contrast to a conception of *suzhi* as a passive, corporeal investment in some bodies at the expense of others,[27] I argue for an active conception of *suzhi* that centers skill and spatial situated-ness. Foregrounding the ways that skill is situated in place draws attention to how spaces, not just bodies, takes on civilized or backwards qualities. In turn, centering *suzhi* in the analysis of rail space illuminates a neglected dimension of how passenger-dedicated high-speed rail (hereafter: HSR) reshaped China's cultural geography. Rail has long been central to China's development: during opening and reform, it met the need for cheap mass transportation, delivering migrant workers to coastal factories and students to

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Approach to Passengers' Gathering Taskscapes', *Journal of Transport Geography* XIX (2011), pp.1031–1036

[25] On *suzhi*, see T.Jacka, 'Cultivating Citizens: Suzhi (Quality) Discourse in the PRC', *positions: asia critique* XVII (2009), pp.523–535; G.Sigley, 'Suzhi, the Body, and the Fortunes of Technoscientific Reasoning in Contemporary China', *positions: asia critique* XVII (2009), pp.537–566; A.Kipnis, 'Suzhi: A Keyword Approach', *The China Quarterly* CLXXXVI (2006), pp.295–313; on *wenming*, see P.Duara, 'The Discourse of Civilization and Pan-Asianism', *Journal of World History* XII (2001), pp.99–130; R.Holmes, 'Pillars of Fat: The Corporeal Aesthetics of Civilization (Wenming) in Contemporary Art', *The China Journal* LXXII (2014), p.125; on rail, see Leung, *Railway Patterns*; E.Köll, *Railroads and the Transformation of China* (Cambridge, MA, Harvard University Press, 2019)

[26] T.Ingold, The Perception of the Environment: Essays on Livelihood, Dwelling and Skill (London, Routledge, 2002); T.Ingold, Being Alive: Essays on Movement, Knowledge and Description (London, Routledge, 2011)

[27] A.Anagnost, 'The corporeal politics of quality (suzhi)', *Public Culture* XVI (2004), pp.189–208; Sigley, *Technoscientific Reasoning*

distant universities. Yet in the early 2000s, despite years of investment in expansion, upgrading rolling stock and increasing speed, the system remained a crowded, chaotic, and unpleasant means of transport that pushed passengers to their limit.[28] China's airways and highways, also recipients of massive state investment, offered increasingly attractive alternatives to rail to a growing segment of travelers with different—'higher'—expectations of what constitutes acceptable travel conditions in terms of speed, cost, and comfort.

The rail system responded with a huge investment in a brand new set of trains and track: passenger-dedicated high-speed rail. While a substantial literature examines HSR in terms of China's political economy and urban development,[29] HSR's impact on rail travel's social character has received less attention.[30] The futuristic profiles of sleek new carriages and the hulking facades of new stations are complemented by an equally novel social environment within: like an airplane cabin but more spacious, stewards in sharp new uniforms await passengers inside air-conditioned, non-smoking compartments of forward-facing seats.[31] Yet HSR's impact is not limited to creating distinct facilities and

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[28] S.Lee, 'Higher Earnings, Bursting Trains and Exhausted Bodies: the Creation of Travelling Psychosis in Post-reform China', Social Science & Medicine XLVII (1998), pp.1247–1261; Bullock et al., *Tracks*

[29] R.Bullock, J.Sondhi and P.Amos, Tracks from the Past, Transport for the Future: China's Railway Industry 1990-2008 and its Future Plans and Possibilities (Beijing, The World Bank, 2009); Z.Chen, K.E.Haynes, Y.Zhou and Z.Dai, High Speed Rail and China's New Economic Geography: Impact Assessment from the Regional Science Perspective (Edward Elgar Publishing, 2019); Y.Qin, 'China's Transport Infrastructure Investment: Past, Present, and Future', Asian Economic Policy Review XI (2016), pp.199–217; Zhou et al., High-speed

[30] Chan & Yuan, 'Changing Travel Behaviour', M.Givoni and D.Banister, 'Speed: the less important element of the High-Speed Train', Journal of Transport Geography, XXII (2012) pp.306–307

[31] *China Railway Yearbook 2012 [Zhongguo Tielu Nianjian]* (Beijing, Ministry of Railways Archives History Center [Tiedaobu Dang'an Shizhi Zhongxin], 2013), p.115; the similarity between HSR and airline stewardesses was also remarked upon by respondents.

levels of service, but about what passengers do and do not do. New, more 'civilized' social norms are communicated through official media, but also through how passengers conduct themselves and relate to others. An examination of how *suzhi* is actively practiced in rail space reveals that HSR serves the needs of a more discriminating ridership as much by cordoning off low-*suzhi* rail travel practices as by increasing speed: HSR's innovations are social as much as technical.

In the following sections, I illustrate how Ingold's accounts of skill and region can put to work recent scholarship on the geographies of skill and mobility to investigate the production of cultural space. Ingold's thinking is also used to highlight the role of place and skill within the literature on quality and civilized-ness in China. Following a brief discussion of methods, I examine how embodied *suzhi* markers are used by passengers to regulate their social interactions on board, as well as analyzing how carriage design and the proliferation of new objects like smartphones have shaped rail sociality in *suzhi*-laden ways. I then examine how these practices are depicted in media and signage within rail space. In closing, I contextualize these transformations of rail space *suzhi* within China's intensifying governance of citizenship and behavioral norms.

Skill and habit on the train

Cultural geographers have radically rethought skill in the last decade: debates over the death of craft skill in the face of industrial process have given way to an understanding of skill as practical, processual, technical, ecological and political practices found in every realm of human endeavor.[32] Anthropologist Tim Ingold draws on

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[32] M.Patchett and J.Mann, 'Five advantages of skill', *cultural geographies* XXV (2018), pp.23–29

developmental biology, ecological psychology and phenomenological philosophy to develop what he calls the 'dwelling perspective', an approach 'founded on the premise that the forms humans build, whether in the imagination or on the ground, arise within the currents of their involved activity.'[33] Here I examine how Ingold's emphasis on process and situated-ness illuminates the cultural and placed character of rail travel practices. The study of rail travel as a skilled practice is an outlier in a literature that tends to focus on expert practitioners of unique crafts such as angling, taxidermy, or beekeeping.[34] Such crafts are where skill is most visible, involving tools and environments distinct from those encountered in everyday life. Yet skill is not absent simply because it is not visible.[35] Skilled practice often lurks under the appearance of mundane habit; as Goffman showed, even walking down a crowded street demands sophisticated maneuvering.[36]

The skills of rail travel—from how to navigate the station, how to socialize onboard, how to pass the time, even how to look out the window—are emblematic of how the skillfulness of everyday practices becomes naturalized into invisibility. In rail's early days, its arrival triggered anxiety: how to safely navigate this half-industrial space? How to behave in this novel social environment? In Europe and in China, guidebooks and etiquette manuals were published to educate passengers on the 'hidden skills and

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[33] Ingold, *Being Alive*, p.10

[34] S.Eden and C.Bear, 'Reading the River Through "Watercraft": Environmental Engagement Through Knowledge and Practice in Freshwater Angling', *cultural geographies* XVIII (2011), pp.297–314; M.Patchett, 'The Taxidermist's Apprentice: Stitching Together the Past and Present of a Craft Practice', *cultural geographies* XXIII (2016), pp.401–419; E.C.Adams, 'How to Become a Beekeeper: Learning and Skill in Managing Honeybees', *cultural geographies* XXV (2018), pp.31–47

[35] Patchett and Mann, 'Five advantages of skill', p.24

[36] E.Goffman, *Relations in Public* (Transaction Publishers, 2009)

established cultural practices that [we]re needed to handle a train journey, wait in line or interact with strangers.'[37] One handbook noted that reading works as an 'excellent weapon of defence against bores;' rail station bookstalls and even lending libraries quickly proliferated.[38]

Yet these skills rapidly became second nature, rendering guidebooks unnecessary: skill was evident only in its absence, in the awkward bodies of 'country bumpkins' fresh off the four o'clock train.[39] Even today, however, being-with-others on the move requires skilled maneuvering of physical and social space, even if the skill remains sub-conscious. Alongside the subtleties of managing luggage in rail space,[40] the temporary society of the compartment requires a careful navigation of containment and intimacy. Passengers employ 'strategies of enclosure' to create private spaces in intimate confines, or make 'gestures of responsibility' to non-verbally communicate transient senses of community.[41] A deliberate disengagement is a key skill for enduring long stretches of non-action; what Bissel describes as 'forms of passivity that are actively called upon.'[42]

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[37] O.Löfgren, 'Motion and Emotion: Learning to be a Railway Traveller', *Mobilities* III (2008), pp.331–351, p.332; regarding China, see Köll, *Railroads*, pp.147, 154

[38] quoted in Löfgren, 'Motion and Emotion', p.343; for more on rail and reading, see Schivelbusch, *The Railway Journey*, pp.64–67

[39] Löfgren, 'Motion and Emotion', pp.339–340

[40] D.Bissell, 'Conceptualising Differently-mobile Passengers: Geographies of Everyday Encumbrance in the Railway Station', Social & Cultural Geography X (2009), pp.173–195; Watts, 'The Art and Craft', pp.714–15

[41] D.Bissell, 'Comfortable Bodies: Sedentary Affects', *Environment and Planning A: Economy and Space* XL (2008), pp.1697–1712; Bissell, 'Moving with Others'; D.Bissell, 'Passenger Mobilities: Affective Atmospheres and the Sociality of Public Transport', *Environment and Planning D: Society and Space* XXVIII (2010), pp.270 – 289; Bissell, *Transit Life*

[42] Bissell, 'Moving with Others', p.67

Rail travel troubles distinctions between skill and habit, visible and invisible, and also the distinction between action and inaction.[43]

Ingold's work has probed at the ambiguities of skill, arguing skilled practice plays a central role in the relation between people and their environment. Ingold's notion of skill highlights process and situated-ness. In foregrounding the *processual* dimension of skill, Ingold challenges a Taylorist definition of skill as the disciplined application of a predetermined series of discrete steps. Ingold's attention to the *situated-ness* of skill also lends itself admirably to human geography: the practitioner is always already situated in an object-filled, richly structured environment with which they are actively engaged.[44] This framework emphasizes relationality: 'To describe a thing as a tool is to place it in *relation* to other things within a field of activity in which it can exert a certain effect.'[45] This logic applies to environments and users as well as tools: all three are defined in relation with each other. Consequently, skill is always specific to particular spatial and material arrangements.

Ingold coins the term 'taskscape' to draw attention to the phenomenological way that environments disclose themselves to those within them. Ingold argues that people come to know their environment the same way walkers learn a landscape—as an ongoing interaction oriented towards a purpose.[46] Every environment is made, by human and

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[43] D.Bissell, 'Habit Displaced: The Disruption of Skilful Performance', *Geographical Research* LI (2013), pp.120–129; T.Ingold, *Being Alive*, pp.60–61; T.Ingold, 'Five questions of skill', *cultural geographies* XXV (2018), pp.160–61

[44] Ingold, *Perception*, p.5; see also D.Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', *Feminist Studies* XIV (1988), pp.575–599

[45] Ingold, *Being Alive*, p.57

[46] Op. cit., p.59; see also R.Hunt, 'On Sawing a Loaf: Living Simply and Skilfully in Hut and Bothy', *cultural geographies* XXV (2018), pp.71–89

nonhuman actors, through the process of being inhabited, and the meanings thereby disclosed are not secondary to or separate from that practical material engagement.[47] This perspective escapes an analytic divide between a real 'natural' landscape and secondary 'cultural' meanings layered onto it.[48] Applied to the built environment, this analytic directs attention away from the question of what its builders intended and towards the question of what meanings are disclosed for its inhabitants through skillful engagement.

Rail offers many examples of how novel built environments, particularly transportation infrastructures, can transform perceptions in quite unanticipated ways. Schivelbusch details how the sheer speed of rail travel challenged, revolutionized, and fatigued travelers accustomed to slower modes.[49] A wholly new 'panoramic' landscape was revealed: vast and ever-changing, scant with detail but sweeping in scope.[50] This transformed the relationship between travelers and landscape in two ways. First, it brought distant locales into intimate contact: as the network expanded 'the whole population of the country would, speaking metaphorically, at once advance *en masse*, and place their chairs nearer to the fireside of their metropolis', condensing an entire country into 'one immense city'.[51] Even as it brought regions together, however, rail infrastructure interposed itself between traveler and landscape: '[the traveler] hardly knows the names of the principal cities through which he passes', each reduced to stations which 'contain the essence of its personality just as upon their signboards they

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[47] Ingold, *Perception*, pp.178–79, 186
[48] Op. cit., p.208
[49] Schivelbusch, The Railway Journey
[50] Op. cit., p.60
[51] quoted in Schivelbusch, *The Railway Journey*, p.34

bear its painted name.'[52] Rail travel abstracts away from the particularities of any given place in order to create region at the scale of the nation.

Ingold argues for an understanding of spatial knowledge that is neither a 'bird's-eye view' that presents the world from a perspective of imagined omniscience, nor one that confines knowing to a series of snapshots from fixed points of observation. Rather, environmental knowledge emerges from 'journeying from place to place along a way of life,' as a network of circulations which integrate knowledge not *from* a series of locations but *across*:

> One can no more know in places than travel in them. Rather, knowledge is regional: it is to be cultivated by moving along paths that lead around, towards or away from places, from or to places elsewhere.[53]

Moving and knowing are inextricably entwined, and the new landscapes produced through rail travel are not merely perceptual. Rail gives rise to region at a novel scale, produced through the same processual, situated engagement which weaves together every landscape—but an engagement both broader and more attenuated. I argue it gives rise to a novel pair of regions: an exterior region of the territories newly integrated by the railroad, and an interior region constituted within the stations and carriages of the rail system—rail space. Rail space requires the cultivation of a whole new suite of skills, but once acquired they unlock circulation within a new region whose contours are described by the geographical extent of the rail network. Rail travel forges of a sense of knowing and belonging to a vast new region, and to a new community of practice within it.

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[52] Ruskin, quote in Schivelbusch, *The Railway Journey*, p.55; Proust, quoted in Schivelbusch, *The Railway Journey*, p.40

[53] Ingold, *Perception*, p.229

Counter to a simplistic technological determinism, the problems posed by rail technology were perceived and managed in different ways by different classes and in different places. In Europe, the bourgeois debate over how to design closed compartments reflected and manifested dual anxieties of isolation and overexposure; yet in third and fourth class carriages, lower class passengers socialized freely and 'merry conversation and laughter rang.'[54] On American railways, an open 'saloon' design modeled after river boats, where rich and poor moved freely within was the norm until a first class came into being with the Pullman car.[55]

Euro-American railways developed at a distance from the state; in China, as in Belgium and Italy, rail was explicitly a nation-building project from early on. The early Republican state sought to shape a new kind of Chinese citizen, instilled with 'modern,' civilized qualities;[56] rail was a site where these abstract qualities took on a concrete form:

> The railroads' amalgamation of railroad-related time and body discipline with other Western 'civilizing' aspects of social engineering aimed at broader concepts, such as courtesy or hygienic awareness in public space.[57]

In the 1930s, state textbooks for school children had chapters devoted to proper behavior at rail stations, including orderly queueing.[58] The community within the compartment became a microcosm for society, where the norms of social intercourse,

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[54] quoted in Schivelbusch, *The Railway Journey*, p.67

[55] Schivelbusch, *The Railway Journey*, pp.103–108

[56] Sigley, 'Technoscientific Reasoning'; S.H.Lei, 'Moral Community of Weisheng: Contesting Hygiene in Republican China', *East Asian Science, Technology and Society: an International Journal* III (2009), pp.475–504; H.Harrison, *The Making of the Republican Citizen: Political Ceremonies and Symbols in China, 1911-1929* (Oxford, Oxford University Press, 2000)

[57] Köll, *Railroads*, p.147

[58] Op. cit., p.159

including gender relations, were worked out anew.[59] In learning to find their way through rail space, passengers were also learning how to be members of a nascent Chinese nation.

Quality and civilized-ness as skill

> As us Chinese people's national quality (*suzhi*) has improved, as people's quality has improved, a lot of uncivilized (*bu wenming*) behavior is less common. Before, sitting on those slow trains, food trash was littered all over, people were taking off their shoes with their smelly socks, a lot of that kind of thing. But now people like that are rarer, and *suzhi* is much higher. *Suzhi* keeps going up, doesn't it?[60]

In contemporary China, one dominant strand within the debate of 'proper' citizenship centers around the concept of *suzhi*. Difficult to define precisely, *suzhi* refers to 'a combination of material and ethical substances' including both 'the physical and quantifiable features of the body' as well as 'forms of human conduct that are measured in terms of ethical, moral, and cultural value.'[61] *Suzhi* is marked by and marks a bewildering array of bodily qualities—height, skin color or hygiene—and personal comportment—accent, table manners or clothes—and marks difference across such divides as urban and rural,[62] modern and backwards,[63] rich and poor,[64] Han and

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[59] Op. cit., p.160; J.Zhang, 'Social Class Aboard the Train [Huocheshangde shehui dengji]', *Art Museum [Meishuguan]* (2010), pp.166–177

[60] Interview 5. All translations by author.

[61] Sigley, 'Technoscientific Reasoning', pp.539, 547

[62] W.Sun, 'Suzhi on the Move: Body, Place, and Power', *positions: east asia cultures critique* XVII (2009), pp.617–642; B.Ingebretson, 'The Tuhao and the Bureaucrat: The Qualia of "Quality" in Rural China', *Signs and Society* V (2017), pp.243–268; Y.Lin, 'Turning Rurality into Modernity: Suzhi Education in a Suburban Public School of Migrant Children in Xiamen', *The China Quarterly* CCVI (2011), pp.313–330; Jacka, 'Cultivating Citizens'; M.Schneider, 'What, then, is a Chinese peasant? Nongmin discourses and agroindustrialization in contemporary China', *Agriculture and Human Values* XXXII (2015), pp.331–346

[63] Lin, 'Turning Rurality'

[64] Ingebretson, 'Tuhao'; Anagnost, 'Corporeal politics'; H.Yan, 'Neoliberal Governmentality and Neohumanism: Organizing Suzhi/Value Flow through Labor Recruitment Networks', *Cultural Anthropology* XVIII (2008), pp.493–523; L.Qian, 'The "Inferior" Talk Back: Suzhi (Human

minority,[65] and center and periphery. *Suzhi* is often most clearly apprehended in its absence: its lack can be seen in the figures of 'rural migrants, litterbugs, the short, the nearsighted and the poorly dressed.'[66] Uneasily situated between innate and nurtured, *suzhi* can in theory be improved by public intervention in the form of education, or through individual consumption of nutritional supplements or etiquette guides.[67] *Suzhi* education (*suzhi jiaoyu*) has been posited as a corrective for China's test-centric educational system,[68] and the peasantry's lack of it is blamed for the failure of rural development.[69] In practice however, the *suzhi* of the lacking—the rural, the poor, the uneducated—exists in a realm that appears unbridgeably distant from that of the urban, the rich, the educated.[70]

The notion of *suzhi* dates to the reform period of the late seventies, rising to prominence by the mid-2000s. The term 'civilized-ness' (*wenming*), on the other hand, has long been central to debates over modernity, development and bodily comportment in China.[71] As China struggled with foreign encroachment in the late Qing, modernizers and nationalists argued China's woes were due to a pervasive lack of 'quality' among its

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Quality), Social Mobility, and E-Commerce Economy in China', *Journal of Contemporary China* 0 (2018), pp.1–15

[65] J.Wu, 'Governing Suzhi and Curriculum Reform in Rural Ethnic China: Viewpoints From the Miao and Dong Communities in Qiandongnan', *Curriculum Inquiry* XLII (2012), pp.652–681

[66] Kipnis, 'Suzhi', p.296

[67] A.Kipnis, 'Subjectification and education for quality in China', *Economy and Society* XL (2011), pp.289–306; Jacka, 'Cultivating Citizens'

[68] Wu, 'Governing Suzhi'; Lin, 'Turning Rurality'; D.Lin, *Civilising Citizens in Post-Mao China: Understanding the Rhetoric of Suzhi* (Taylor & Francis, 2017), Chapter 6; R.Murphy, 'Turning Peasants into Modern Chinese Citizens: "Population Quality" Discourse, Demographic Transition and Primary Education', *The China Quarterly* (2004), pp.1–20

[69] Schneider, 'Chinese peasant'

[70] Anagnost, 'Corporeal politics', p.190

[71] Sigley, 'Technoscientific Reasoning'; Lin, *Civilising Citizens*, Chapter 5

people.[72] The primarily quantitative approach to population—the more, the better—of the Qing court gave way to an increasingly qualitative analysis of individualized development; technologies of statistical measurement which rendered bodily qualities visible emerged alongside technologies of discipline which aimed to improve those qualities. This tradition of Chinese governmentality draws on globally circulating discourses of neoliberal population governance, but has a distinct lineage.[73]

In the reform period, *suzhi* and civilized-ness have both circulated through official and popular discourse of modernity and development. Jiang Zemin's push for 'spiritual civilization' in the 1990s gave way to *suzhi* in the oughts. In the last decade civilization has made a comeback in the guise of 'ecological civilization' and also as one of the twelve Core Socialist Values.[74]

As a form of human 'quality', *suzhi* is conceptualized in the academic and popular Chinese discourse as a corporeal thing. This conceptualization has facilitated the analysis of *suzhi* as 'human capital', labor in its congealed form.[75] Here I approach *suzhi* as value in motion: how does *suzhi* realize value through an ongoing production process? Markers like accent, clothing, and other forms of bodily comportment may appear innate but are actively performed; highlighting the processual nature of these manifestations of *suzhi*

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[72] The terms used during this period are also translated as quality, but are not the same: *zhiliang* and *pinzhi* were more prevalent prior to the 1980s. They share the same character: '*zhi*' (质). See Sigley, 'Technoscientific Reasoning'; Kipnis, 'Suzhi'

[73] M.Foucault, *The Foucault Effect: Studies in Governmentality* (University of Chicago Press, 1991); H.Yan, 'Neoliberal Governmentality'; A.Kipnis, 'Neoliberalism Reified: Suzhi Discourse and Tropes of Neoliberalism in the People's Republic of China', *The Journal of the Royal Anthropological Institute* XIII (2007), pp.383–400

[74] Lin, Civilising Citizens, Chapter 5; D.Lin and S.Trevaskes, 'Creating a Virtuous Leviathan: The Party, Law, and Socialist Core Values', Asian Journal of Law and Society VI (2019), pp.41–66; Holmes, 'Pillars of Fat'

[75] Anagnost, 'Corporeal politics'; Yan, 'Neoliberal Governmentality'

draws attention to the contingent and actively produced character of what seems inescapably 'natural.'[76]

The lens of skill troubles the assumption, implicit in the language of 'lacking' *suzhi*, that 'low' *suzhi* practices are less demanding than those of 'high' *suzhi*. I found in my research that practices that are, from one perspective, representative of low *suzhi* are from another perspective skillful strategies for surviving arduous rail journeys. Keeping each other entertained—sane, even[77]—over marathon multi-day train journeys is not easier than disappearing into one's phone to shop or chat. I therefore adopt a methodological agnosticism as to whether 'high' or 'low' *suzhi* translates into 'high' or 'low' levels of skill.

Second, situating *suzhi* in space shows how *suzhi* (and the behaviors through which it is enacted) are woven into the material environment. The question of spatiality lurks in the background of the *suzhi* literature: Anagnost writes that *suzhi*'s non-relation of lack and plenitude 'is stunningly concretized by the construction of new gated communities far away from the *pinmin ku* (the Chinese translation of what Marx called "ghettos of the poor" in Capital).'[78] Yan juxtaposes the hot, cramped stairway filled with rural women hoping to become housemaids waiting outside and the air-conditioned, gleaming office of the employment agency, indexing a stark spatialization.[79] *Suzhi* is instantiated not only in the bodies of rural migrants and urban professionals, but in an

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[76] W.Sun, 'Symbolic Bodies, Mobile Signs: The Story of the Rural Maid in Urban China', *Asian Studies Review* XXXIII (2009), pp.275–288
[77] Lee, 'Higher Earnings, Bursting Trains'
[78] Anagnost, 'Corporeal politics', p.190
[79] Yan, 'Neoliberal Governmentality', p.493

increasingly bifurcated built environment. The corollary of the taskscape is that the environment also shapes skilled practice: certain environments offer different 'affordances,' or potential actions and perceptions.[80] The possibilities for action the build environment provides enable and constrain what sort of *suzhi* can be manifested.

Attending to the situated-ness of *suzhi* illuminates how rail space shapes space not just inside the compartment but in China as a whole. The deep divides between rural and urban, backwards and developed which are central to *suzhi* discourse only become viscerally apparent when they collide: the rural nanny's lacking *suzhi* is made manifest in Beijing,[81] and the refined *suzhi* of the well-educated civil servant becomes tangibly present in rural, poverty-stricken Anhui.[82] Rail is a central mechanism for this collision, the integument which knits together the once-isolated regions of metropole and countryside into an integrated, albeit highly uneven, national space.

Rail also produces a wholly novel taskscape within: inside its stations and carriages, migrant laborers and educated urbanites rub elbows in the most literal way. This makes rail space a site where discourses of quality and civilized-ness take on concrete forms: *suzhi* is measured by the quiet circumspection of one's seatmate, in the cleanliness of the restrooms. In assessing rail space, passengers do not distinguish clearly between the *suzhi* of the space and the *suzhi* of the passengers. *Suzhi* is environmental as much as it is corporeal.

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[80] J.J.Gibson, The Ecological Approach to Perception (London, Houghton Mifflin, 1979)
[81] Sun, 'Suzhi on the Move'
[82] Ingebretson, 'Tuhao'

For decades, rail space and passenger practices evolved in parallel, complementing each other so closely their interdependence was difficult to see. The rise of high-speed passenger-dedicated rail lines (HSR) has created a rupture in the homogeneity of rail space. HSR carriages offer a different set of affordances than conventional carriages, and enable a different suite of traveling practices; a new set of responsibilities to other traveling bodies. As passengers move between HSR and conventional rail spaces, certain practices become noticeable, suddenly out of harmony with their environment. This mismatch renders visible the ways in which *suzhi* infuses both rail spaces and rail practices—and how the development of HSR works to transform the *suzhi* of rail space and the *suzhi* of rail travelers.

Methods

This article draws on findings from seven months of fieldwork conducted in 2016 and 2017. Building on ethnographic approaches centering questions of corporeality, affect and practice,[83] I used participant observation, photography, and interviews to investigate the bodies, things, and infrastructures of Chinese rail space. My positionality as a non-Chinese passenger gave me partial access to rail space: the purchase of a ticket granted me entry, but certain dimensions of rail practice were inaccessible due to citizenship or cultural background. As a novice passenger in Chinese rail space, I had to

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[83] Watts, 'The Art and Craft'; Watts and Urry, 'Moving Methods'; J.D.Dewsbury, 'Performative, Non-Representational, and Affect-Based Research: Seven Injunctions', in D.DeLyser, S.Herbert, S.Aitken, M.Crang and L.McDowell, eds., *The SAGE Handbook of Qualitative Geography* (SAGE Publications, 2010), pp.321–334; R.Longhurst, E.Ho and L.Johnston, 'Using "the Body" as an "Instrument of Research": Kimch'i and Pavlova', *Area* XL (2008), pp.208–217; J.Ash, 'Visceral Methodologies, Bodily Style and the Non-human', *Geoforum* LXXXII (2017), pp.206–207

learn how to navigate at the same time I was investigating its social character; I used this position as learner to make the practices of rail travel visible.

Drawing on infrastructural methodologies and the materialist turn, I conceptualize rail space as a more-than-human assemblage composed of both the technical infrastructure of track and station, and the community of practice comprising its passengers.[84] The larger research project seeks to investigate the materiality of nation and state in the form of rail infrastructure.[85]

The participant observation portion of the research took the form of riding the train. Routes encompassed both high-speed (HSR) and conventional trains, and geographically spanned from Manzhouli on the Russian border to Sanya on the South China Sea; from Khorgos on the border with Kazakhstan to Mudanjiang, above North Korea. Despite this broad scope, a concentration of routes around places of residence in Guangzhou and Beijing was unavoidable. Observations were documented in the form of fieldnotes and photographs. Interviews were conducted in Chinese with rail passengers of a range of ages, education levels and socio-economic classes, though demographically skewed towards younger, better educated and middle class. Interviewees were recruited by convenience sampling on board the train, and via snowball sampling.

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[84] S.L.Star, 'The Ethnography of Infrastructure', *American Behavioral Scientist* XLIII (1999), pp.377–391; T.Bennet and P.Joyce (eds.), *Material Powers: Cultural Studies, History and the Material Turn* (London, Routledge, 2010); D.H.Coole and S.Frost, *New Materialisms: Ontology, Agency, and Politics* (Durham, Duke University Press, 2010)

[85] M.Skey and M.Antonsich (eds.), *Everyday Nationhood: Theorising Culture, Identity and Belonging after Banal Nationalism* (London, Palgrave Macmillan, 2017); Coole and Frost, *New Materialisms*; P.Merriman and R.Jones, 'Nations, materialities and affects', *Progress in Human Geography* (2016), pp.1–18; P.Joyce and C.Mukerji, 'The State of Things: State History and Theory Reconfigured', *Theory and Society* XLVI (2017), pp.1–19

Practicing *suzhi* on the rail

In order to examine how *suzhi* manifests through the skillful and situated practices of rail travel, this section examines how practices of rail sociality shifts over space and time. I found a double movement: respondents reported that socializing on the train had changed between 'before' and 'now' and between conventional and HSR carriages. 'Before' or on conventional trains, rail travel involved a greater degree of social interaction, while 'now' or on HSR trains, the atmosphere of the carriage encourages self-containment and enclosure. These differences are on the one hand, pragmatic adaptations to the distinct travelling conditions, and on the other, are woven into larger social narratives of modernity and backwardness, wealth and poverty, urbanity and rurality: in a word, of *suzhi*.

Suzhi and 'civilized-ness were used interchangeably to describe—and criticize the conditions of rail space. Rail space, where carefully maintained distance between civilized and uncivilized bodies is collapsed, cast *suzhi* in sharp relief. Analyzing *suzhi* in this moment of concrete manifestation reveals how it is produced not as a passive quality to be 'built into' bodies, but how it is actively embodied through skillful engagement with a richly structured environment. As process, *suzhi* manifests in rail space through interpersonal interaction, ways of dressing, and methods for passing time and staying fed that are simultaneously pragmatic strategies for dealing with the material realities of rail travel and are also markers of social distinction.

In addition to judgements from passengers regarding the *suzhi* of rail spaces, I also find that HSR in particular exhibited efforts to inhibit or discourage practices seen as emblematic of low *suzhi*. I examine the means by which rail space attempts to educate

passengers of HSR trains in 'proper' behavior on the train, how to behave, how to speak and how to eat while on board, and what that tells us about the role of *suzhi* in the political economy of the rail system.

While presented here as dichotomies, I do not intend to argue there are only two ways to travel by train in China. While certain suites of travel practices tended to cluster, distinctions were far from absolute. The practices I discuss are mixed and matched differently by individual passengers, and the ridership of conventional and HSR trains overlap.

Conversation, near and far

> Because I'm relatively extroverted, on board it's no big deal to chat with my tablemates. By and large I chat—or these days, maybe everyone is playing with their cellphones, doing their own thing, listening to music.[86]

Respondents invariably described the trains of previous decades as chaotic and slow, too full of people, their food and their smell. One of the few things that was remembered with any fondness was the social atmosphere—an exciting mix of new people to get to know over the long hours or days of travel. Facing each other across the small tables in the hard seat carriages, passengers told stories, played cards, and shared sunflower seeds as the miles rolled by. Food was both a necessity on long journeys, and also a way to pass time and to socialize. Small fruits and seeds keep hands busy and are easy to share with fellow travelers. 'Before' rail carriages were much more convivial conversational spaces, and 'now' people tended to keep to themselves. Passengers accustomed to longer trips on slower trains were more open to social intercourse with the

[86] Interview 4.

temporary society of the carriage than those whose experiences of rail travel came from shorter trips on newer trains. Older passengers, whose expectations of rail travel were formed in the old 'greenskin' carriages tended to prefer socializing. Yet similar trains also remain the norm for poorer passengers and in more isolated areas. Outside the well-traveled inter-city routes, or for migrant workers returning home as cheaply as possible, those modes of travel and the social atmosphere that goes along with it still remain.

Other passengers, however, prefer to erect clear boundaries between themselves and their seatmates. Conversation is only proper if there is a sufficient degree of similarity of age, of education—of *suzhi*.[87] In the new rail space etiquette, the suitability of conversation is not assumed. A number of respondents highlighted the role of mobile communications as a driver of this shift. Smart phones have radically expanded the options available to rail passengers, allowing them access to streaming video and music as well as staying in contact with friends and family via WeChat, China's ubiquitous messaging app.

> Before we didn't have anything to speak of. Before, when we didn't have these toys, we'd sit down with people we didn't know to play cards because getting online with cellphones to watch movies, to watch TV wasn't this convenient. Just getting the news was amazing. Any sort of chatting [via app] wasn't convenient—it was all by SM, as expensive as one penny per text. There was no Wechat, or even QQ. Most people would play cards with strangers. But now that's rare, now basically everyone on the train if they aren't sleeping then they're playing on their phones.[88]

Smartphones' outsized role in contemporary Chinese rail practice parallels the role newspapers and paperback novels played on early European trains, allowing

[87] Interview 1.
[88] Interview 5.

passengers to opt out of the awkward social space generated by new temporalities of travel. While mobility studies has examined how smartphones have reshaped traveling practices in Western contexts,[89] the combination of HSR's tighter temporalities and the sudden ubiquity of smartphones in China has created a particularly sharp break between travel practice "before" and "now."

> In general, short trips don't work. Short trips, it's just one moment and then you're there, you still haven't gotten into the right state of mind by the time you arrive. On long trips though, on truly long trips you can get to know one another.[90]

Multiple shifts in China's transportation system have conspired to reduce the length of the average train trip in the past decades. Train travel as a whole has gotten much faster in China: between 1990 and 2007, a series of network-wide 'speed-ups' increased the average train speed for conventional passenger trains by 40%, to 69 kmh.[91] The introduction of HSR in the 2000s reduced travel time by another order of magnitude: some lines operate at average speeds as high as 289 km/h, three or four times faster than conventional lines. For trips longer than 1000 km (about four hours on HSR), air travel is an increasingly competitive alternative.[92] Consequently, train trips of a day or more are a once-common experience now endured only by the economically and geographically marginal.

While the distinction between conventional and HSR carriages does not strictly reflect travel time—one may spend minutes on a slow train or the better part of a day on a

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[89] Bissell, Transit Life
[90] Interview 8.
[91] Bullock et al., *Tracks*, p.37
[92] Zhou et al., *High-speed*, pp.3–7

high-speed train—the arrangement of the carriages further contributes to shaping distinct social spaces. HSR introduced a different compartment design:

> D: It's only on conventional trains you can chat?
>
> I8: Yeah, face to face. On HSR, the seats are in rows and on conventional trains there are two seats facing each other. Chatting like that is better…. You could say [HSR] is an environment where it's just not very convenient to chat: craning around behind you to talk, it feels a bit improper. On the high-speed trains, people definitely chat less.[93]

HSR carriages are much quieter than conventional carriages: not only is there less conversation, the relative quiet of the train itself makes raised voices stand out all the more. HSR also integrates smart phone usage more smoothly than conventional trains. The scarcity of outlets on conventional trains limits the utility of smartphones, even for passengers carrying external batteries. Onboard the newer HSR trainsets, however, electrical sockets are easy to find.

While respondents narrated this shift in terms of 'before' and 'now,' my fieldwork showed this distinction to be less temporal and more spatial. China's convivial train culture endures among those whose journeys are still days-long, without access to electricity or signal. With the rise of HSR, this distinction is sharply drawn: HSR tickets cost three to five times more than equivalent conventional tickets. The HSR network describes an uneven spatiality: HSR began by connecting major cities like Beijing, Shanghai and Guangzhou, and despite rapid expansion these metropoles remain disproportionately well-connected. The distinction between conventional rail and HSR

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[93] Interview 4.

comes to coincide not only with *suzhi*-laden dichotomies like modern and backward, rich and poor, but also urban and rural, central and peripheral.

Transforming passengers into citizens

Constructing rail space as a civilized, high *suzhi* environment is a site of active intervention by rail management—particularly on HSR. New norms of self-contained bodily comportment are communicated through ubiquitous videos, posters and signage in stations and carriages. Figure 7.1 shows a selection of stills from what I term rail practice public service announcements (or PSAs): short films which communicate to passengers how to comport themselves in rail space, including how to navigate stations, how to read tickets, what dangerous items are forbidden, how to use hot water taps, but most crucially, how to behave. These films play on large video screens facing station plazas and inside waiting rooms, while HSR carriages are typically equipped with monitors in every compartment. Intercut with advertisements for products like movies, amusement parks or whiskey, descriptions of the train's technical features, and announcements of new line openings, the pervasive nature of these films suggests the central importance of passenger behavior in shaping the social character of rail space.

These guides to proper behavior are notable in two ways: first, they frame proper behavior in terms of civilized-ness (See Figure 7.2). Civilized-ness, moreso than *suzhi*, figures prominently in the discourses in and about rail space. Rail practice PSAs connect larger state campaigns concerning 'civilized-ness' and the other eleven Core Socialist Values to the concrete practices of everyday rail travel. Second, the target of rail practice PSAs are kinds of behaviors that inconvenience other passengers. Passengers who take up too much space, eat foul smelling foods, throw garbage on the floors of carriages,

Figure 7.1. Left: a placard beside a set of automatic ticketing machines in Wuhan reads: 'Observe morality and respect order; travel safely; yield in a civilized (wenming) way.' Right: A poster in Hechuan reads: 'Together let's make the whole country a civilized (wenming) region; let's cooperate to make Hechuan a beautiful garden.' All photos by author.

quarrel over seats, smoke in carriages, and otherwise make rail travel unpleasant for other are depicted as unshaven, clueless brutes (see Figure 7.3). Despite over a century of use, rail space remains a site where the state seeks to instill with 'modern,' civilized qualities of punctuality, discipline and proper bodily comportment. However, reshaping passenger comportment is not solely a pro-active form of state citizen-making—in the case of Chinese HSR rail, it is also a reaction to passenger's rising expectations of comfort and service. The same set of behaviors targeted by rail practice PSAs—making noise, making messes—were repeatedly highlighted by my respondents as the most consistently unpleasant aspects of rail travel.

Yet the low *suzhi* ridership whose traveling practices render rail travel intolerable to high *suzhi* passenger remains, and remains dependent on the conventional rail network. The spatiality of *suzhi* is thus a pressing dilemma for the rail system: spaces suited to the needs and preferences of the low *suzhi* passengers who rely on the rail system must be maintained, even as spaces catering to the high *suzhi* passengers who the rail system

needs to remain profitable must be engineered. The system is caught between the incompatible requirements of the passengers who need the rail system, and the passengers the rail system needs. In order to serve both these incompatible riderships, the Chinese rail network has developed into a bifurcated network, divided by cost, speed and traveling practices. Yet this strategic move can only partially and unevenly resolve the tension between low- and high-*suzhi* riderships: the HSR and conventional rail still intersect, as do their riderships. While many HSR stations are wholly separate from conventional stations, in stations serving both networks, waiting rooms are often arranged in such a way to achieve de facto segregation—often literally cordoned off. The contradictions of *suzhi* have been concretized into the very infrastructure.

Figure 7.2. A rail practice PSA plays above the line to enter Chengdu Station. The subtitle reads, 'Please yield in a civilized (wenming) manner to allow old, young, sick and disabled passengers enter first.'

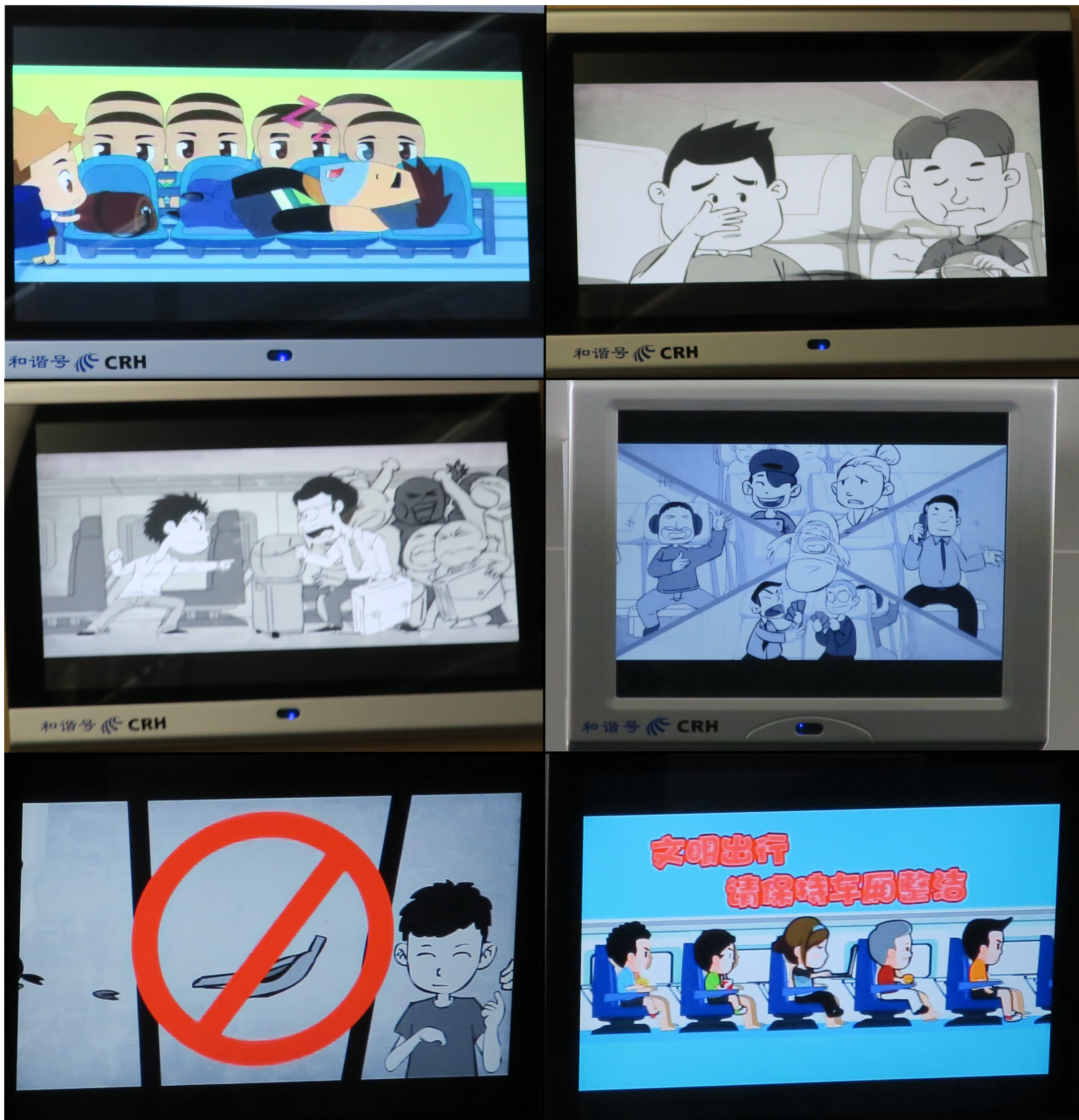

Figure 7.3. Descending, from left to right: an oaf hogs the waiting room bench, an inconsiderate passenger eats a durian, and two men quarrel during boarding (on a train from Shenzhen to Xiamen); passengers talking to seatmates and on the phone disturb a baby (between Shangrao and Nanchang); a banana peel in the aisle causes an accident, and, finally: 'Journey in a civilized way: please keep the carriage neat and tidy' (between Wuhan and Guangzhou).

Conclusion

Applying Ingold's dwelling perspective to the build environment of rail illustrates the central role played by skill in articulating together culture and place. Transportation infrastructures like rail create new regions within and outside their walls, expanding communities of practice beyond the local. This brings the question of the national community to the fore; how skill knits it together, but also how skill propagates fractures within it.[94] This article's findings suggest that the geography of skill is a productive and illuminating site for the investigation of cultural production at the national scale.

This article's examination of *suzhi* as skill builds on existing scholarship concerning its discursive and corporeal qualities to show how it is actively produced and situated in place. Steeped in distinctively Chinese discourses of civilization and development, *suzhi* is materially embodied by travelers and embedded within rail space. Rail travel collapses the distance between rural and urban, poor and wealthy between regions in China; moreover, the material situatedness of *suzhi* in rail space has significant consequences for the development of the Chinese rail network, forcing a bifurcation of rail space that materially manifests the widening wealth gap in China. Even as the rural, the poor and the uneducated scramble to improve their social standing, the gap between the haves and the have-nots continues to widen.

The ways in which skill and social quality are concretized into the infrastructure of the Chinese rail system takes on a deeper resonance when considered in light of the Chinese state's use of the rail system to shape passengers as citizen-subjects. The nascent

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[94] see also Edensor, National *Identity*

"social credit" system now punishes those with poor credit by banning them from purchasing rail and plane tickets, turning rail space from a site of education to an apparatus of enforcement.[95] If, as Ingold argues, moving through space is how people come to know their world, then engineering infrastructure is a means of shaping perception at a core, phenomenological level. Yet this article suggests that the determination of what responsibilities passengers are obligated to fulfil is not a simple function of state power, but a complex horizontal and even bottom-up negotiation: passenger preferences and ingrained practices also exert a tangible pressure on what is acceptable. Despite the power such infrastructural assemblages afford the state, the agency of passengers remains.

Bridge

This chapter examines how rail space has become a laboratory for the construction of class in contemporary China. *Suzhi* becomes a central criteria by which people and places are judged. Passengers use *suzhi* to discern the quality of their fellow travelers and their accommodations, and state officials and rail administrators use 'civilization' to discipline passengers to enhance rail space quality and maximize the system's value. The emergence of *suzhi* as a central criteria is not due to bottom-up or top-down forces, but to their convergence. The following chapter examines the tension between population and government from a different vantage, that of citizenship and legibility. In the next chapter, I argue that the real name ticketing system and the proliferation of the *shenfenzheng* national identification card combine to give rail

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[95] 'China to bar people with bad 'social credit' from planes, trains' (*Reuters* 2018)

infrastructure a substantive role in shaping citizenship in everyday life, making it into a ‘circulatory panopticon.’ As with *suzhi*, the contours of citizenship are not wholly determined by a top-down disciplinary process, but through mobilizing passengers to actively render themselves legible. By conceptualizing the rail ridership as a ‘natural phenomenon,’ the state is able to bring passengers to regulate themselves; yet as with every other state action, it produces unintended fractures, or diffractions, as well.

CHAPTER VIII

THE CIRCULATORY PANOPTICON: RAIL INFRASTRUCTURE AS CITIZENSHIP-REALIZING AND -DIFFRACTING APPARATUS AND FOUCAULT'S REALIST TURN

Introduction

In 2011, China Railway introduced 12306.cn, its brand-new, $52 million online ticketing system (Wertime, 2012). After a rocky few years, purchasing tickets online—and complaining about its shortcomings—has become an integral part of the rail travel experience. In 2014, a terrorist attack on Kunming rail station triggered an intensification of station security across China: the relatively unfettered flow of passengers, well-wishers, hawkers and criminals in and out of stations came to a halt. At the center of both of these shifts is the "real name system", a novel sociotechnology which connects the ticket bought online to the person entering the station via the *shenfenzheng*—the state identification card issued to citizens of the People's Republic of China.

Both domestically and abroad, the ever-evolving efficiency and safety of rail travel has become symbolic of China's economic and technological rise. Yet these technological transformations have social ramifications: in joining rail travel to citizenship status, the state has made the rail system into technology of citizenship (von Schnitzler, 2008), a site where indeterminate and conflicting conceptions of what citizenship means and who can claim it are concretely realized with every trip (Barad, 2007). By inserting state identification into rail travel, the real name system has turned the built environment of the rail system's stations and carriages from a site opaque to the state to one where the identity and movements of individual passengers are fully legible

(Scott, 1998). Rail travel has become what I term a circulatory panopticon: a Foucauldian "apparatus of security" which functions not through discipline but through bringing the population to regulate itself (Foucault, 2009). With the term "circulatory panopticon," I signal two transformations in the function of the classic Benthamite panopticon. First, at a very obvious level, Chinese rail infrastructure does not serve to render people legible by fixing them in place: rather, people become visible to the state apparatus through mobility. Second, the design of the circulatory panopticon operates by a different mechanism which conceived of the population as an altogether different sort of thing: not as a fixed collection of definite individuals to be disciplined, but as a natural, aleatory phenomenon to be regulated through its inherent inclinations. Travelers produce themselves as legible state subjects, turning their agency to the purposes of the state.

The function of the railway real name system is to create determinate boundaries, filtering legible citizens into standardized spaces, yet the cuts enacted by the rail system do not always neatly coincide. Even as the rail system determines boundaries between citizen and non-citizen, between legible and legitimate subjects of the state and the rest, it also produces a variety of not-quite subjects scattered across that new-drawn line of difference—what Barad (2007) terms "diffraction." The theoretically seamless join between citizenship and rail travel produced by the real name system is for some people in some places quite marked: non-citizens behave at times like citizens, and some citizens find themselves excluded. This diffraction cuts across populations and also territories: rail space also exhibits diffraction within and outside its boundaries. In practice, neither those populations nor those spaces are as clear cut as they seem.

In emphasizing these diffractions this article is not making the claim that the Chinese rail system only *appears* to integrate populations and territories, concealing a messier underlying reality. On the contrary: both the integration and the diffraction of citizenship and territory are fully real. Rail can function as a citizen-making apparatus only because it is already a passenger- and space-making apparatus (Schivelbusch, 1986). Rail infrastructure enables a certain population circulation within a certain region, realizing a homogenized interior within a determinate boundary in both material and discursive reality. The question this article asks is not whether rail acts as a centrifugal or centripetal force in China, but rather how mobilizing rail travel as an apparatus of citizen-making, weaving state definitions of citizenship into everyday life, transforms citizenship in ways that are not wholly what the state intended.

To better understand how the introduction of the real name system has transformed rail infrastructure into a citizen-making apparatus, I synthesize Barad's account of agential realism (2007) with Foucault's work on governmentality (2008, 2009). The keystone of this synthesis is their shared notion of the "apparatus," a practice or technology which does not merely operate on pre-existing entities, but which is essentially productive—of things, of concepts, of realities. The two theorize the apparatus from very different exemplars, however: for Barad the quintessential apparatus is that of quantum experimentation, and for Foucault it is the apparatus of government. Considered as an apparatus, rail infrastructure brings together Barad's interest in the apparatus as productive of a diffracted reality and Foucault's interest in "the problem of circulation" in the emergence of governmentality (Foucault, 2009, p. 64). Synthesizing a hybrid Baradian/Foucauldian apparatus combines Foucault's analysis of the state and Barad's

theory of diffraction to better understand how paper tickets and plastic identification cards, steel railways and concrete station buildings, can both lend reality to governmental rationalities while also manifesting real discontinuities—how power is both instantiated and compromised in the same moment.

This synthesis moreover produces a novel insight into the status of "reality" in Foucault's thinking. Following Lemke (2015), I read Foucault's Collège de France lectures as presenting not just an elaboration or extension of his earlier work on juridical and disciplinary forms of power, but a subtle reworking of his object of analysis: no longer primarily concerned with the construction of governmentality, his analytic is also concerned with the construction of reality. This realist turn allows Foucault to be read back into Barad's forthright realism, producing a conception of governmentality as produced through intra-action between human and non-human agents.

The first section of this article examines the role of the apparatus in Barad and Foucault's writing, with a particular attention to their discussion of reality as emergent. I then introduce the Chinese rail system, situating it within the historical development of the Chinese state. The following two sections examine how the real name system has been woven into the online ticketing system and the control of rail space. A final section offers some conclusions concerning how the hybrid, realist account of the apparatus presented here can be applied to further investigate the citizen-making dimensions of large scale infrastructure.

Methodology

This account of the Chinese rail system draws on data collected through participant observation within the rail system as well as interviews with rail passengers.

Fieldwork was conducted over seven months in 2016 and 2017. Drawing on materialist and affective ethnographic methodologies (Dewsbury, 2010; Fox & Alldred, 2015; Militz, 2017; Whatmore, 2006), I conducted a traveling ethnography of rail infrastructure (Marcus, 1995; Star, 1999) by riding as a passenger on trains throughout China: east to near the North Korean border, east to the China-Kazakhstan border, south to the shore of the South China Sea,[*] and north to China's border with Russia. In addition to covering the extent of the rail network, traveling by both conventional and high-speed rail, I also traveled a selection of routes multiple times over many days to develop a sense of normality and variation along a single stretch of track. I used this participant observation to gather data, on the variation and standardization of architectural forms and spatial affordances offered by rail space, the management of rail space and the practices employed by passengers during their time within rail space.

I conducted twenty interviews with rail passengers, recruited onboard and via snowball sampling. I interviewed passengers of a variety of genders, ages, educational and regional backgrounds, but with noticeable tendencies towards higher educational attainment and younger ages. Interviews focused on passengers' practices and preferences concerning rail travel, their history with rail travel and, particularly with older respondents, their memories of the system's development over time.

This project employs this data on the spaces of the rail system and the passengers that navigate them to investigate the rail system as a citizen-making apparatus. In Baradian terms, I examine the diffraction patterns evident within rail spaces in order to

[*] This route was also entirely by rail: a ferry takes rail carriages from the mainland to Hainan; then along the HSR route to Sanya on the southern tip of the island.

understand the nature of the apparatus that produces them (Barad, 2007, p. 73; Hollin, Forsyth, Giraud, & Potts, 2017, p. 927). As shall become clear below, a great deal turns upon the "I" in the previous sentence, and on the position of the researcher within the research apparatus.

The account of the Chinese rail system in this article is the rail system that exists in relation to the particular research apparatus with which it was measured (Fox & Alldred, 2015). As Barad demonstrates in her account of the Stern-Gerlach experiment, even quantum physics materially engages questions of gender, class, and national background (Barad, 2007, pp. 161–168). The particular patterns of significance that made themselves evident are without question shaped by my particular relation to the rail system. For example, my sustained interest in how citizenship and passenger legibility are entangled is deeply shaped by my position as a passenger traveling with a foreign passport. More pressingly, my position relative to the Chinese rail system surely rendered other, equally real, patterns of significance invisible. My interviews made clear that perceptions and practices varied considerably with age, for example. As a consequence, the citizen-making apparatus described here is definite but not definitive, open to alternate diffractions through which other patterns of difference are made real.

Theorizing the Apparatus with Barad and Foucault

Barad's theory of agential realism synthesizes feminist materialisms and quantum physics to produce an account of reality that emphasizes its continual re-realization through the material and discursive practices of multiple human and non-human agencies (2007, 2014). Characterized by a rigorous attention to the specificities of quantum experimentation, Barad shows how to integrate a series of classic dichotomies—material

and discursive, science and society, nature and culture—within a single analytic. By the same token, however, the application of this analytic to the social world is less clear. Within a larger re-orientation towards material reality (Anderson, Kearnes, McFarlane, & Swanton, 2012; Whatmore, 2006), geographers have drawn on Barad to grapple with the role of the material and the non-human in geopolitical discourse (Darling, 2014; Squire, 2015) and the regulation of borders (Squire, 2014). Squire draws on Barad to examine how the very category of "human" is constituted through "struggles to de/value people, places and things" without "assuming either the supremacy or the powerlessness of people" (2014, p. 12).

Where Barad is a new addition to geographic theory, Foucault has long been a touchstone for critical analyses of spatial discourses and practices (Gregory, 1994; Soja, 1989). His notion of governmentality, the political rationalities through which concepts and practices become thinkable and doable, has been influential within political geography (Crampton & Elden, 2007; Garmany, 2009; Jessop, 2007). In the past decade, this engagement has been re-invigorated by the publication in English of his 1977-1979 lectures at the Collège de France (2008, 2009). These pivotal lectures present many familiar Foucauldian concepts in a subtly but profoundly new light: more contingent, more relational, and more than human (Collier, 2009; Elden, 2007a; Lemke, 2015). Anglophone political geography has drawn on concepts such as the "aleatory" (Clarke-Sather, 2017; Elden, 2007b) and the "milieu" (Campbell, 2019; McNeill, 2017) to extend Foucauldian theory beyond the oft-cited panopticon.

Rail systems constitute an enlightening case for relating Barad and Foucault's divergent conceptions of apparatus. Considered as a Baradian apparatus, rail shows how

apparatuses produce a determinate materialdiscursive reality, cutting new entities out of heretofore indeterminate phenomena through the intra-action of human and nonhuman agencies. Rail also illustrates Barad's notion of diffraction: how apparatuses generate imbrications of difference along the apparently-homogenizing cuts they enact. Considered from a Foucauldian vantage, rail illustrates how the apparatus (*dispositif*) functions as governing mechanism—the ensemble of techniques, discourses, architectural forms and so forth through which power takes form. Rail, as transportation infrastructure, is inseparable from the problem of circulation which Foucault identifies as the core problematic of governmentality (2009, pp. 48–49). Yet it is also the solution: by getting ahold of the reality of rail, the state can intervene in these circulations to constrain the bad and facilitate the good, producing a space suitable to the application of political and economic calculation (Brenner & Elden, 2009; Elden, 2007a). Synthesizing Barad and Foucault through the lens of rail infrastructure shows how the contingent intra-action of human and nonhuman produces novel realities, realities upon which apparatuses of state power can gain purchase. This approach allows us to trace how the diffractions of rail space consequently introduce diffraction into state determinations of citizenship as well.

Quantum Physics and the Baradian Apparatus

Barad's central concern is ontology: she argues that both social constructivists and positivist scientists have misunderstood what it means to exist, and that a radical rethinking of reality is needed (2007). Central to this rethinking is Barad's conception of the apparatus, which emerges from a Foucauldian analysis of the laboratory experiments of classic quantum physics. Yet this conception of apparatus is not limited to the realm of the scientific, nor to the scale of the laboratory. In Barad's hands, the apparatus morphs

from a particular experimental set-up to the core building block of reality itself. Barad's account of the apparatus as a materially and discursive process of becoming sheds light on how the development of rail transformed society. Barad's framework provides a set of questions: what realities does rail infrastructure produce, materially and discursively? What agencies and boundaries are cut into that reality? What diffractions are evident along those cuts? Three aspects of Barad's thinking are salient here: that the apparatus produces a determinate reality, that it produces multiple agencies and that it produces diffraction.

Quantum experimentation is famously peculiar: it demonstrates that photons do not have determinate physical properties outside the particular experimental apparatuses which measure them. A photon is a particle in one apparatus, but a wave in another. Barad argues that this ontological peculiarity is not peculiar at all, but an insight into the nature of reality: while it may appear as if definite entities interact according to their predetermined properties in a Newtonian clockwork, reality is precisely the other way around. Individual entities and their properties are mutually determined through their collision, and different collisions produce different determinations of the same phenomena. The "apparatus" is the particular arrangement which delineates the parameters of the collision: an "open-ended practice" that "enacts an agential cut between determinately bounded and propertied entities within a phenomena" (2007, pp. 170, 176). The "cut" produces boundaries within phenomena, realizing individual entities with determinate properties. "Phenomena" are what there is before intra-action: "ontologically primitive relations—relations without preexisting relata" (Barad, 2007, p. 139). A Baradian lens illuminates how the development of rail does more than just speed the

circulation of people and things, but produced new determinate realities. As Schivelbusch documents, becoming a rail passenger was a process potentially both shocking and fatiguing, in which the passenger "saw and felt [their] own body being transformed into an object of production" (1986, p. 122). While it borrowed from prior modes, rail space was a novel environment that produced novel subjectivities.

Barad argues that, as with quantum theory, agential realism is applicable at every scale from the atomic to the galactic. Barad understands apparatuses themselves as phenomena: cut into a determinate form only by another, auxiliary, apparatus (Barad, 2007, pp. 161, 230). The line between what is an apparatus and what is a phenomenon is therefore itself a situated determination, one that describes a position within the apparatus (Haraway, 1988). Barad takes these principles of situated knowing and interlocking scales to argue that space is no more absolute than individuality—spatial relations also emerge through agential intra-action. Barad's spatiality is topological rather than Cartesian: building on the thinking of Neil Smith (1992), she argues for scale as produced and nested (Barad, 2007, pp. 244–246). Rail networks offer a clear example of how space is produced through material apparatuses, as well as how that infrastructure realizes new spatial discourses.

Barad argues that this ontology describes wave/particle duality and also the social construction of gender: outside of the particular apparatus that determines it, neither are real. Yet given that apparatus, both are entirely real: "once a cut is made (i.e., a particular practice is being enacted), the identification is not arbitrary but in fact materially specified and determinate for a given practice" (Barad, 2007, p. 155). The apparatus produces realities that are both physical and conceptual, both material and discursive:

> "Bohr's argument for the indeterminable nature of measurement interactions is based on his insight that *concepts are defined by the circumstances required for their measurement*. That is, *theoretical concepts* are not ideational in character; they are *specific physical arrangements*." (Barad, 2007, p. 109, emphasis in original)

The concept of photon as particle is itself entangled with specific material arrangements; concepts of gender, class and nation are entangled with specific materialities as well. Nor are science and society wholly separate, as the curious example of the Stern-Gerlach experiment illustrates. Only because one of the scientists smoked cheap cigars that he was afforded by his gender and class were the experimental results rendered visible. As Barad write, "the cigar is a 'condensation'—a 'nodal point,' as it were—of the workings of other apparatuses, including class, nationalism, economics, and gender, all of which are a part of this Stern-Gerlach apparatus" (2007, p. 167).

Barad's apparatus enacts a cut within an indeterminate phenomenon, precipitating out a multiplicity of human and non-human agencies, all of whom play a role in the determination. Barad uses the term "intra-action" to emphasize the mutually constitutive nature of these multiple, emergent agencies. The resulting entities are distinct, but their distinction is a relation of "exteriority within" (Barad, 2007, p. 135). Barad's emphasis on the multiplicity and materiality of these agencies pushes back against the tendency to essentialize power at the level of the apparatus. As a close examination of the practice of rail travel shows, the action of individuals remains crucial to the realization of the apparatus. Despite talk of travelers reduced to living parcels, human agency does not vanish within the rail, or any other transportation system (Watts & Urry, 2008). A simple thought-experiment—what would happen if passengers truly behaved as living parcels?—illustrates immediately how dependent the rail apparatus is on the active, even

skillful, agency of passengers (Bissell, 2018; Watts, 2008). Passengers must deliver themselves to the right platform at the correct time, having produced themselves and their luggage as movable bodies (Bissell, 2009, 2013). Even enduring the boredom of travel requires the active application of self-discipline and mental fortitude (Schivelbusch, 1986). Realizing determinate agents is not a matter of constraining existing agency, but of creating agents whose are capable of realizing the apparatus as a functioning system.

These agents are realized as part of the apparatus, but Barad is keen to examine how they always exceed the apparatus in crucial ways. As the Stern-Gerlach experiment shows, agents are entangled in multiple apparatuses, and their interaction is impossible to predict. Barad examines the "fine detail" of these entanglements of agencies and apparatuses through the notion of diffraction. Another concept borrowed from quantum physics, diffraction was the phenomenon that disproved Newtonian physics. Where Newtonian light theory predicts that light passing through a grating will produce clean geometric discontinuities, a single sharp divide between light and dark, the experimental apparatus instead shows a complex imbrication of light and shadow along the cut. "There is no sharp boundary separating the light from the darkness: light appears within the darkness within the light within…" (Barad, 2014, p. 170).

In addition to examining the marks left on bodies in order to understand the material specificities of the apparatuses that produced them, Barad uses diffraction to explore fine detail of exclusionary cuts *within* any given apparatus. The diffraction of light demonstrates the determinate, yet highly complex interpenetration of opposites that results from the agential cut. The cut enacted by the apparatus produces difference, but

also unites across that boundary—what Barad terms “cutting together-apart” (2014). As she writes on disability:

> “…the very nature of being able-bodied is to live with/in and as part of the phenomenon that includes the cut and what it excludes, and therefore, that what is excluded is never really other, not in an absolute sense, and that in an important sense, then, being able-bodied means being in a prosthetic relationship with the ‘disabled.’” (Barad, 2007, p. 158)

Diffraction makes it impossible to produce absolute boundaries between light and dark, male and female, white and indigenous, self and other (Barad, 2014). This complicated imbrication of opposites that inevitably results from any determinate realization is evident in the form of the rail passenger, the geography of rail space, and in how both diffract other apparatuses of race, gender and class. Separating out rail passengers from the population produced a boundary in both practice and in space. Repeated rail travel was accompanied by a new set of practices, an iterative citationality that marked out the uninitiated as a figure of scorn (Löfgren, 2008, pp. 339–340). The rapid circulations within rail space marked the territory beyond the scope of the rail network as marginal and impenetrably distant, even as they remained unchanged. Existing apparatuses of class, race and gender all take on new and concrete configurations among rail passengers. “First-class” tickets mark out class structure in literal, material form; a divide also marked by distinct modes of socialization. In colonial India, the railways enacted a double move: carriages and waiting rooms materialized a divide between European and native but, to the indignation of upper-caste Indians, did not enact a divide between genders (Goswami, 2004, Chapter 3).

Rail as a Baradian apparatus shows how it produces new communities and new spaces—new realities of the sort Cronon described as “second nature” (1991, pp. 56, 72).

It also shows how rail is always already entangled in questions of governance. In China, the relation has been empirical fact for over a century, as the state has owned and operated China's railway system under both the Nationalist and the Communist governments. Yet across the globe, even in laissez-faire nineteenth century England, railways repeatedly demanded the intervention of the state, from granting monopoly rights to operators to enforcing uniform gauges (Hugill, 1995; Vance, 1986). Rail is one component of the industrialization of transportation, a development which transformed what Foucault terms "the problem of circulation" epitomized by the town, scarcity and epidemic from a perpetual irritant for the sovereign monarch to the central concern of the modern state. As second nature, rail is part of the "reality" which the art of government attempts to grasp hold of—and is also part of the apparatus with which it grasps.

The Problem of Circulation and the Foucauldian Apparatus

The real name system has turned the Chinese rail system into an apparatus of surveillance; yet the essential logic by which it does so it strikingly different from that of Bentham's Panopticon. The panopticon often serves as synecdoche for Foucauldian theory writ large, the archetypal apparatus of state power. Its role in materialist critiques is particularly striking: Mukerji faults Foucault for underplaying the role of "power derived from controlling and shaping the natural world," employing material things and the built environment to shape the conditions of collective life (2010, p. 402). She continues: "[t]raditions of wall design do not enter into discussions of the panopticon, and the same is true for the skills of masons" (Mukerji, 2010, p. 403). The panopticon plays a similar role in Barad's critique of Foucault. While the Foucauldian notion of "practice" plays a pivotal role in Barad's thinking, in her eyes Foucault nonetheless overly

privileges the social, limiting agency to humans and leaving the relationship between matter and discourse ambiguous (2007; cf. Lemke, 2015, pp. 6–7). Citing *Discipline and Punish* (1979), Barad writes that while "Foucault claims that the specific material configuration of the prison (e.g., the Panopticon form) supports and enacts particular discursive practices of punishment", ultimately he still treats these material forms as mere means, rather than meaningful or agential in their own right (Barad, 2007, p. 63).

It is questionable how well the panopticon captures the scope of Foucault's thinking. In the first instance, the panopticon was never anything more than a thought experiment—the skill of masons does not enter into the panopticon in part because bricks never did. Foucault's other examples of discipline, drawn from actual educational and military spaces may lack the panopticon's crisp imagery but provide some measure of material engagement. Significantly, however, the panopticon makes a poor shorthand for Foucauldian theory because it exemplifies precisely the conception of power that his investigation of "security" or "governmentality" moves beyond. While *Discipline and Punish* (1979) concerns the historical transition from rule by law to rule by discipline, in the 1977-9 Collège du France lectures, Foucault examines how states innovate a new mode of governance not through the perfection of control but by "letting things happen" (2009, p. 45). Power is not exercised via "an exhaustive surveillance of individuals so that they are all constantly under the eyes of the sovereign in everything they do" (Foucault, 2009, p. 66), but rather via a conception of a whole—a "population" or "milieu"—that allows the state to act *through* the phenomenon in such a way that it comes to regulate itself.

What is most distinctive about security is not the apparatuses it employs but how it understands the reality that it seeks to act upon. The outlines of this reality first impinge upon the state as problems of circulation. Circulations, “indefinite series of mobile elements” (Foucault, 2009, p. 20) subject to chance and crisis, lack the definite features that allow individual subjects to be judged or disciplined. Much like photons, it is only when taken as a whole that this aleatory reality stabilizes, exhibiting predictable means, probabilities, normal curves, and other regularities (Foucault, 2009, p. 74). Coming to grips with this reality requires new apparatuses, not least among which is a new branch of mathematics: statistics, etymologically the “knowledge of the things that comprise the very reality of the state” (Foucault, 2009, p. 274). Statistics, themselves gathered by novel bureaucratic regimes, reveal to the state a reality characterized by its indifference to law, and resistance to reductive discipline. Governing this reality can only be accomplished by:

> “…allowing circulations to take place, of controlling them, sifting the good and the bad, ensuring that things are always in movement, constantly moving around, continually going from one point to another, but in such a way that the inherent dangers of this circulation are canceled out” (Foucault, 2009, p. 65).

This, in turn, necessitated a rethinking of the relation between the apparatuses of governance and the phenomenon being governed. Instead of imposing control over a malleable subject, the state must graft onto a natural and unyielding reality:

> “…an apparatus (*dispositif*) for arranging things so that, by connecting up with the very reality of these fluctuations, and by establishing a series of connections with other elements of reality, the phenomenon is gradually compensated for, checked, finally limited, and, in the final degree, canceled out, without it being prevented or losing any of its reality.” (Foucault, 2009, p. 37)

Foucault’s analysis of security is thus, contra Mukerji and other materialist critics, very much concerned with the shaping of the natural world. It is through a historical

process of grappling with persistent problems of circulation, in the form of grain scarcity, market towns, and contagion that this particular understanding of governance is conceived. Vaccination, in particular, struck the state as "a pure matter of fact, of the most naked empiricism," its efficacy both undeniable yet "unthinkable" long before it was theorized as part of an art of government (Foucault, 2009, p. 58).

Along similar lines, the "milieu" emerges as a "pragmatic structure" in the work of town planners before it exists as a concept: "the apparatuses of security work, fabricate, organize, and plan a milieu even before the notion was formed and isolated" (Foucault, 2009, p. 21). The milieu is "a set of natural givens—rivers, marshes, hills—and a set of artificial givens—an agglomeration of individuals, of houses, etcetera" which collectively describe the medium of action and the element in which it circulates (Foucault, 2009, p. 21). The milieu marks the emergence of a new subject of state action: not territory nor individual people, but of "things" (Foucault, 2009, p. 96; Lemke, 2015, p. 9). This is an intrinsically more-than-human conception of reality that recognizes the poly-functionality of material things: streets circulate merchandise and rioters, grain and smallpox.

More than milieu, however, the pre-eminent target of the apparatuses of security is the population. In place of a collection of individual subjects under sovereign's rule, the populations presents itself as a set of processes, "a kind of thick natural phenomenon" (Foucault, 2009, p. 71) that is "everything that extends from biological rootedness through the species up to the surface that gives one a hold provided by the public" (Foucault, 2009, p. 75). The state gets a hold on the population through desire: by getting

a hold of the variables upon which the public's desire depends and manipulating them so that the pursuit of their "natural desire" leads towards the state's ends.

The population is a definite entity, but not an entity that exists independently of or prior to the apparatuses which mark it—"A constant interplay between techniques of power and their object gradually carves out in reality, as a field of reality, population and its specific phenomena" (Foucault, 2009, p. 79). At the same time, however, the population is something outside of the state—it is the external surface of a nature upon which the state can graft its apparatuses (Foucault, 2009, p. 75).

In accounting for the emergence of security as a novel form of government, Foucault produces an account of reality strikingly similar to Barad's. It theorizes reality as a process of becoming: "by what conjunctions a whole set of practices—from the moment they become coordinated with a regime of truth—was able to make *what does not exist* (madness, disease, delinquency, sexuality, etcetera), *nonetheless become something*" (Foucault, 2008, p. 19, emphasis mine). It also opens a space for agency for both humans and non-humans: rather than a matter of disciplinary determination, Foucault here conceives of governance as "a practice which is not imposed by those who govern on those who are governed" but through "transaction, in the very broad sense of the word, that is to say, '*action between,*' that is to say, by a series of conflicts, agreements, discussions, and reciprocal concessions" (Foucault, 2008, p. 12, emphasis mine). Coupled with the rooted-ness of milieu and population in the natural world, these "transactions" between multiple agents can be understood as between not just humans, but non-human agents as well. In grappling with the realist turn of governmentality, Foucault's conception of governance becomes more realist as well.

Concepts of milieu and population illustrate how the state confronts the problem of circulation, producing new apparatuses and a new reality through which natural processes can be governed and brought in line with the intentions of the state. Circulation was not, however a novel problem: the free town, with its troublesome circulations of commerce and plague was long been a known, but contained exception to sovereign rule. The process by which circulation exceeded the town and became the primary problem for the state is, I argue, precisely the expansion of circulation through the development of global trade and industrial transportation (Hugill, 1995; van der Vleuten, 2004; Vance, 1986). Accordingly, considering rail infrastructure as milieu and passengers as population allows us not only to investigate how industrial transportation realizes community and territory at a novel scale, but also how the state works to get hold of these novel realities. In the following section, I employ this toolkit to analyze the development of the Chinese rail system. Since its earliest days, the Chinese state has attempted, with partial success, to get hold of the rail system in order to regulate its circulation in order to realize realities conducive to state ends. The introduction of the real name system into the rail system works to turn the force of rail travel towards the goal of rendering passengers as legible state subjects; in appropriating the rail apparatus towards this purpose, however, the real name system diffracts the determination of citizenship through the material infrastructure of rail in ways the state does not intend.

Realizing and Diffracting Chinese Citizens through the Apparatus of Rail

The development of rail in China was caught, from its first moment, in a struggle over what sort of reality it would enact. Foreign powers sought to punch rail lines deep into the interior to pump in manufactured goods and extract mineral resources; the Qing

court sought to develop rail under its own authority to counter foreign encroachment and modernize its economy; provincial elites sought to use rail to raise capital and nationalist consciousness (Leung, 1980). Rail's potential to realize new discursive and material structures was most fully manifest in the northeast, where Japan's South Manchuria Railway was the central mechanism for a wholesale effort to rebuild society, from marketization and industrialization to education and sanitation; the SMR formed the nucleus of the Manchukuo puppet-state (Duara, 2003; Elleman & Kotkin, 2010). In the Republican era, the railways constituted a bureaucratized, professionalized core during a period riven by cliques and warlords (Köll, 2019; Morgan, 2001).

These competing intentions realized an incoherent rail network in the first half of the nineteenth century that rendered travel within China's borders more difficult than travel across them (Dong, 2011, p. 214; Duara, 2003, pp. 188–189). After 1949, the People's Republic made rebuilding and revitalizing the war-torn and inchoate rail network a priority, deploying special army units to assist with the construction (Comtois, 1990; Köll, 2019). The Ministry of Railways guided the integration and extended the network into the interior (Naughton, 1988). The construction of new lines functioned to pull populations and territories long isolated in hinterlands into national circulations (Meyskens, 2015).

If the absence of circulation posed certain problems to the realization of the Chinese state, so too did its presence. In the early 1950s, refugees from the countryside flocked to cities, straining urban resources, particularly food (Köll, 2019, pp. 257–259). To manage this crisis, the state took the *hukou* or household registration system, meant to ensure public security, and transformed it into a disciplinary apparatus fixing each family

in place (J. Brown, 2012; Solinger, 1999). Grain flowed into cities, but people did not. Rural-urban population movements happened at the whim of the state; most notably during the Cultural Revolution, when Mao opened the rail network to the Red Guards (Köll, 2019, p. 268). During the period of opening and reform, the *hukou* system remained law but was no longer used to restrict movement. This allowed rural migrants from the interior to pour through the rail system to the urbanized coast, transforming the Pearl River Delta in Guangdong into the "world's factory." Yet without legal right of residence, migrants are cut off from social welfare provision, essentially becoming illegal immigrants to their own country, (Chan, 2009, p. 204).

Even as domestic air (Fallows, 2012; Jiaoe Wang, Mo, & Wang, 2014) and automobile (Si-ming Li & Shum, 2001) transportation infrastructure has expanded at a rapid pace, rail has remained a pillar of Chinese mobility. Rising demand has kept the rail system in a constant state of reform and expansion since the early nineties (Bullock, Sondhi, & Amos, 2009). A dramatic series of speed increases in the late nineties, which saw average speeds increase by over 40% by 2005 (Bullock et al., 2009, pp. 37–38), was qualitatively eclipsed by the advent of HSR since the mid-aughts (Zhou, Ollivier, Bullock, & Jin, 2014). HSR plays a central role in the governance of economic and urban development (Chen, Haynes, Zhou, & Dai, 2019; Salzberg, Bullock, Jin, & Fang, 2013).

Even as it serves as an instrument of state power, however, rail continues to enable circulations inimical to the state. At the turn of the millennium, rail space was doubly opaque: not only were the flows of passengers unmanageable, the powerful Ministry of Railways functioned as a "state within a state," planning and executing construction projects with little input from the central government (Köll, 2019, p. 289;

Osnos, 2012). Sustained high demand has kept trains crowded, and upgrades to comfort and cleanliness have not kept pace with rising expectations: if HSR is symbolic of China's rise, then conventional rail represents its continued backwardness. Rail travel has long been associated with chaos and crime; Guangzhou Railway Station was for decades a particularly notorious gathering place for drug addicts (Liang, Li, & Li, 2013). The annual Spring Festival, when rural migrants return home en masse, has become a crisis point that tests the state's resources. *Huangniu*, or scalpers, take advantage of travelers desperate to get home and their inside connections to drive ticket prices to outrageous highs (Gao & Cui, 2011). The tight association between rail travel and the PRC state works both ways: complaints about scalping can segue seamlessly into complaints about governmental corruption in general. Rail safety is another flashpoint: the Wenzhou collision in 2011 became a lightning rod for criticisms of the government's prioritization of economic development over safety (Bondes & Schucher, 2014). In the last decade, rail has also become a target for those who wish to attack the state: in 2014, a terrorist attack attributed to Uyghur separatists on the Kunming rail station left 31 dead, the most lethal of a series of attacks on railway stations in 2014 and 2015 (Purbrick, 2017).

These problems demonstrate the stakes of railway governance for the Chinese state: the rail system is simultaneously a potent apparatus for regulating the economic and political conditions of the Chinese population, but also serves as a pressure point through which the state can be destabilized. The state has responded to these crises in a variety of ways. The Wenzhou collision led to a reduction in maximum speeds lasting until 2018, the arrest of the once-untouchable Minister of Railways, and ultimately to the dissolution of the Ministry of Railways into the governmental Ministry of Transport and a state-

owned enterprise, the China Railway Corporation. The development of HSR is, arguably, a response to rising discontent with the overcrowded, chaotic traveling conditions of conventional rail.

The introduction of the real name system into rail spaces in the past decade can be seen as another such response. The real name system enabled two major transformations of rail space, the online ticketing system and the enclosure of stations. Online ticketing has considerably smoothed the ticket purchasing process and reduced the power of scalpers to manipulate ticket prices. The enclosure of rail space has reinforced public safety and made stations into visible outposts of the state. With these changes, the real name system has sharpened the boundaries the rail apparatus enacts between passenger and non-passenger, rail space and non-rail space. The real name system incorporates another apparatus of the state—the national identification system realized in the form of the *shenfenzheng* card.

For the vast majority of Chinese citizens, the "real name" in the real name system is the name on their *shenfenzheng*, or national identity card. The *shenfenzheng* attaches a name, face, and biometric data to a unique, life-long 18 digit number stored in a nation-wide computerized database, enabling the government to track, monitor, and curtail movement and behavior deemed a risk (C. L. Brown, 2008; Sapio, 2014). The second generation *shenfenzheng*, was rolled out starting in 2003. It was designed in coordination with China's Golden Shield Project, an effort in the late nineties to enhance the state's surveillance and public security apparatuses with modern information and communications technology; better known today as the "Great Firewall" (C. L. Brown, 2008, pp. 63–64).

Unlike the bulky, *hukou* booklet shared by the entire family unit, the *shenfenzheng* is personal in concept and practice: it identifies individuals and takes the form of a wallet-sized card. These cards are the most common and convenient form of everyday identification for Chinese citizens, used to obtain education, open bank accounts, rent an apartment, mail packages and purchase tickets for bus, plane or train. The sudden centrality of the *shenfenzheng* to the most banal elements of rail travel—buying tickets, entering the station—has transformed rail space into an apparatus for the realization of citizenship, a site where difficult questions of belonging and identity are not an abstract problematic but a matter of practical, pressing concern. Today, to enter rail space passengers must be able to produce themselves as legible consumer-citizens, utilizing their desire to travel to power a circulatory panopticon.

<u>Ticketing and the Legible Subject</u>

It is easy to underplay how revolutionary online ticketing has been for the experience of rail travel in China. The first step of travel is planning: the imaginary, social and material work of shaping the future journey (Watts, 2008, p. 713). For decades, buying a rail ticket in China was an arduous journey all its own: prospective passengers had to travel to the station of departure weeks ahead of time and wait in line at the ticket office, hoping that scalpers had not already bought out the whole train. Almost everyone I spoke to had a story of waiting in line all day, only to discover there were no tickets and having to come back again. More recently, services emerged allowing passengers to send someone to the station on their behalf, or, in some cities, go to a neighborhood ticket agency and pay a small additional fee. Tickets weren't sold more

than two weeks in advance, making planning ahead deeply uncertain: particularly during Spring Festival, the stress and uncertainty was enormous.

The introduction of the online ticketing system on 12306.cn, rolled out nation-wide in 2012, has completely transformed this experience. China Rail started using a computerized ticketing system in 1996, but assigned seats to region according to fixed quotas as late as 2008 (Bullock et al., 2009, p. 54). Despite a rough rollout, plagued by technical glitches (Wertime, 2012), the ability to purchase tickets online, from anywhere, has rendered the cavernous ticket offices superfluous. Passengers can pull up the China Rail website or open the smartphone app, and browse every train route in China leaving as soon as the next half-hour to as far off as 60 days. Third-party apps such as Ctrip (*Xiecheng*) offer additional perks like allowing passengers to specify which level berth they prefer on sleepers.

Tickets bought online with a *shenfenzheng* can be picked up from automated ticket machines simply by swiping the card, circumventing wholly the tedious lines of the station ticket office. On some high-speed routes, passengers can swipe their *shenfenzheng* instead of a paper ticket at the boarding gate; this e-ticket plan is scheduled to be rolled out nationally in 2019 (Junwei Wang, 2018). The entire country of China has become a ticket office, reworking both the practices of rail travel and the conceptions of space they presuppose. The combination of quick and convenient ticket purchase from anywhere and the high frequency of trains between major cities has led some passengers produced a habit of delaying ticket purchase until literally on their way into the station. Others wait until the last minute in order to see if airfare, always volatile, dips below the fixed rail ticket price.

The *shenfenzheng* seamlessly coordinates across multiple dimensions of rail travel, reinforcing the role of the Chinese rail system in enacting a citizen cut. This free and easy circulation is nonetheless bounded in terms of who can access it. Without a *shenfenzheng*, rail travel becomes considerably bumpier, diffracting a spectrum of not-quite citizen subjectivities across different scales. For me, traveling under a foreign passport, I discovered that while some aspects of the online ticketing treated a passport as an acceptable proxy for a *shenfenzheng*, others did not. When combined with a Chinese bank account, my passport enabled me to register on 12306.cn and buy tickets, but did not allow me to collect those tickets at an automated machine—along a single line, in Dongguan, was I able to use my passport to get a ticket from machine. Everywhere else, I had to wait in line in the ticket offices.

Ticket offices have yet to wither away. A handful of alternate forms of ID, such as a *hukou* family registration booklet or a domestic passport, can be used to purchase tickets online. Like my passport, they cannot be used with the automated ticket machines. Those who simply forgot to bring their *shenfenzheng* must wait in line at the temporary ID window in the ticket office, then wait in line to get their ticket. Waiting in line at the ticket office and looking over at the much longer line to get a temporary ID, I had a curious feeling: as a foreign citizen I could move through rail space less fluidly than most Chinese citizens, but more fluidly than some. Along one line, in Dongguan, I found automated ticketing machines did accept foreign passports.

There is one place where the apparatus of the *shenfenzheng* and the real name system demarcate citizenship in a way that is sharply at odds with the state's own official definition of Chinese identity. Or rather, there are three: Taiwan, Hong Kong and Macau.

Residents of these places are, officially, Chinese "compatriots" and therefore China does not recognize their foreign citizenship or the passports which document this. The practical workaround has taken the form of home return or travel permits. Up until the mid-2000s, these permits resembled passports; in 2013 and 2015, the permits were revised in the form of wallet-sized cards for, respectively, Hong Kong/Macau and Taiwan residents. In 2017, the Taiwan Mainland Travel Permit can be used not only to purchase tickets online, but to collect tickets from the automated ticketing machines in some cities (Jiahui, 2017); the same is now possible for holders of the Macau and Hong Kong travel permit holders traveling along the new line connecting Hong Kong (Zheng, 2019). These permits increasingly function as almost-*shenfenzheng*, enabling non-mainland Chinese to circulate as if they are PRC citizens while also marking them definitively as non-citizens (cf. Cho, 2017).

The real name system inconveniences those without a *shenfenzheng*; it presents a nigh-unsurmountable barrier to those without a legible state identity. An estimated 13 million "invisible children" were not registered at birth because of the constraints of the one-child policy, the shame associated with single motherhood, or rural inaccessibility; as a consequence they cannot obtain a *shenfenzheng* (Shuzhuo Li, Zhang, & Feldman, 2010). This sub-population has long struggled to access education, healthcare and other social infrastructure; the introduction of the real name system to rail adds freedom of movement to that list (Thomson Reuters Foundation, 2016).

I encountered these fine differentiations of access, what I term diffracted citizenship, during interviews with rail travelers as well. When talking with older people in particular, I encountered an interesting pattern: when asked about how the new online

ticketing system had impacted their experience, they extolled its convenience. Then, when pushed to describe how they use it in more detail, they admitted they did not use it at all—rather, their adult children bought tickets for them. Online ticketing is a transparent and convenient medium for planning rail travel only for those with the technological skill to make it convenient. For older, or poorer passengers, whose internet proficiency or even literacy is lacking, the proliferation of online ticketing presents a new barrier to railway travel (Huo & Wei, 2013).

The computerized ticketing system offers passengers novel and convenient ways of buying tickets and marginalizes scalpers. Through the mechanism of the real name system, it makes the *shenfenzheng*—and the corresponding apparatus of surveillance and control it entails—a vital part of the practice of rail travel. This re-inscribes and also diffracts concepts of citizenship, differentiating between citizens and non-citizens as well as between citizens with unproblematic citizenship and those without. The cuts enacted by the apparatus of the real name system vary not just by group, but across space as well. The more wide-spread and systematic spatial patterns of citizenship can be seen in the enclosure of rail stations.

Station Security and the Regulation of Flows

Complementing shifts in ticketing practices, the spatial management of rail spaces has undergone dramatic change in the past decade. Rail stations, once notorious for offering free and anonymous circulation to passengers, drifters, peddlers and thieves alike, have been enclosed: transformed into a tightly bounded and regulated space allowing only authenticated and authorized individuals to flow through the network. This has cut rail stations off from their local surroundings while knitting the network together

into a single contiguous space of secure circulation. Passengers disembarking in Beijing South Station have already been patted down and their luggage run through x-ray machines, regardless of whether they arrive from Guangzhou, Baoding, or Urumqi. Yet in practice, the legibility and secured interiority of rail space does not always enclose precisely the same space, manifesting a distinctive pattern of diffractions along the boundaries it enacts.

Kunming Station is the origin for the enclosure of station space, as can be clearly seen in the rearrangement of rail space since the 2014 terror attack. Figure 8.1 illustrates the shift: the once open plaza around the golden bull statue has been completely enclosed. The entrance is flanked on one side by a two-story police building, and on the other by a tower (not pictured), from which several rifle-carrying soldiers look out over the crowd. One interviewee, a long-time resident of Kunming, said of the stringent security:

> "Before, it wasn't like that…. After the incident, then it became much stricter. Now—before at Kunming Station people who weren't taking a train could freely come and go in the station plaza, now you can't. Now if you want to get close to the station, you have to have bought a ticket, only people who are taking a train can enter. There are two security checks now: when you first enter they check your luggage, and at the second one they check your name, look at your *shenfenzheng* and ticket, then you can enter the station waiting area.[†]

Kunming Station is an extreme example, but not uniquely so: it was not uncommon to see armed soldiers on duty or patrolling around stations, and every station had a visible public security presence. The incident was brought up by multiple interviewees as the most significant inflection point in the securitization of rail space across China.

[†] Interview with rail traveler in February 2017, in Mandarin, translated by author.

Figure 8.1. Kunming Station plaza. Above: in 2012. Source: CEphoto 2012. Below: in 2017. Source: author.

The real name system is central to the new regime: to enter rail space, passengers must present their ticket, their identification, and themselves all together at the station entrance. Only if all three match can the passenger enter the station proper. This requires, of course, that passengers must have their ticket before passing through security. Even if their ticket was purchased online, passengers must still fetch their ticket in person. As fortune would have it, because the previous ticketing system required people to travel to stations days or weeks prior to travel to get tickets, most stations already have detached

ticket offices with separate entrances. This infrastructural legacy enabled the Chinese rail system to put into practice a novel level of regulation across the whole network with relatively few modifications.

Traces of an alternate imaginary of unfettered circulation are still evident in the designs of the earliest HSR stations. Newly built HSR station follow a standard three level structure: a concourse open to the general public, with shopping and ticket offices at the bottom, a second floor with the train tracks and boarding platforms, and a third floor with an open plan waiting area with gates leading down to the trains below. This allows for the waiting and boarding areas to be cut off from the rest of the station while still allowing free circulation of traffic from one side of the station to the other. Beijing South Station, opened in 2008, and Shanghai Hongqiao Station, opened in 2011, were designed around the principle that the entire station, including the main waiting area, would be open the general public. This principle is most evident in the placement of the ticket offices, which are located within the waiting area (see Figure 7.2). This makes checking the person, identification, and ticket simultaneously at the station entrance impossible. Instead, the station security checks identification and scans bodies and luggage at the entrance, and then rail conductors check tickets against identification at the station gate. The security checks at Beijing South's multiple entrances—from the street and metro—are notably makeshift, awkward interruptions of the station's designed flow. At the boarding gates, conductors stand beside automated ticket gates, using the venerable technology of ticket punch to mark tickets as they check identification and allow passengers down to the boarding platform.

Figure 8.2. Top left, one of the ticket offices on the main waiting area of Shanghai Hongqiao Station; and top right, a map of Shanghai Hongqiao Station inside the station. Bottom left: one of the ticket offices on the main waiting area of Beijing South Station; and bottom right, a map of the station layout provided in the station. Red triangles in right-hand images indicate the approximate viewshed of the left-hand images.

The waiting areas of these stations constitute a liminal zone between the fully enclosed and secured space of the rail system and the exterior, not fully one or the other. Some stations built with internal ticket offices, such as Shenzhen North, were able to renovated in a way that separated the ticket windows from the main floor. However, the majority of HSR stations I passed through, particularly the more recently built, follow the design of Guangzhou South Station, opened in 2011. These stations are similar to Beijing South in many ways, but re-introduce one feature from the previous generation of stations: their ticket offices are directly accessible from the exterior of the station, once again spatially separating ticket purchase from entry into rail space (see Figure 8.3). The

same design now serves a different logic: separate ticket offices now function to enable the three interlocking entities of ticket, identification, and the body of the passenger to arrive simultaneously at the station entrance.

Figure 8.3. A map outside one of the ticket offices at Guangzhou South Station. Guangzhou South typifies the three layer "sandwich" design of new HSR stations, with a concourse open to the general public below the tracks and a shared waiting and boarding area above the tracks. Green boxes indicate the location of the ticket offices; that they are accessible from outside the station proper. Note that only ticket offices No. 2 and No. 3 are in service: the other two ticket offices, on the other end of the station, have been decommissioned.

I draw attention to two ways in which differences are marked within the rail system: the segregation between high-speed rail and conventional rail in the distribution of stations and waiting areas, and in the differential intensities with which the security procedures at stations in different regions are practiced. In a number of ways, China's new passenger-dedicated high-speed rail network is an entirely distinct system from the pre-existing network. It runs on different carriages, with different amenities, staffed by

different personnel wearing different uniforms. Most importantly for the purposes of this article, it primarily serves different stations. The vast majority of the stops made by HSR trains are at new stations built specifically to serve the HSR network. These new stations co-exist with older stations in the same city, often separated by dozens of kilometers. As a result, the passengers traveling by HSR and those traveling by conventional rail are spatially separated. This is not accidental: HSR caters to a different, and wealthier, ridership than conventional rail (Zhou et al., 2014). Separate stations are a way of serving both of these two incompatible riderships. The spatial management of stations that do serve both these groups makes clear the deliberate effort to segregate the two. In Beijing West Station, built in 1996, the HSR trains are boarded from the east side of the station, with station personnel checking tickets at the waiting room entrances. In Chongqing North, the north side of the station, which handles HSR trains, and the south side of the station, which handles long-distance conventional trains, are physically separated, connected only by bus. At Tianjin Station, renovated in 2008, has a single open waiting and boarding area much like Guangzhou South. Within the open concourse, however, a space around the boarding gates for the HSR train to Beijing is fenced off, with a secondary security check separating it from the rest (see Figure 8.4). Cumulatively, these various strategies of station management make it so that the HSR and conventional train ridership rarely if ever share the same space. The tools which are used to realize this segregation are the same apparatuses of security that separate rail stations from their surroundings, here enacting a cut within rail space.

Figure 8.4. The waiting room within the waiting room at Tianjin Station. The secondary ticket check here serves to segregate the spaces of HSR and conventional rail passengers.

The intensity and rigor with which those apparatuses that regulate circulations into rail space also exhibit distinctive patterns of variation. which reveal different relationships between rail space and different regions of China. In Beijing South and Shanghai Hongqiao, the double enclosure of safety and legibility is broken into two distinct steps, creating a liminal in-between that is within security but not yet legible. If

this case demonstrates an ambiguous cut between rail space and its exterior, the cut between inside and outside in Xinjiang is sharply marked. When entering the "normal" railway station in China, the metal detector, pat-down and x-ray scan are relatively perfunctory: the pressure of moving people through as quickly as possible takes precedence. In Xinjiang, however, the security procedures at station entrances are meticulous. Not only are the pat downs are distinctly more thorough than elsewhere, in Xinjiang, and nowhere else, I was repeatedly asked to open my luggage so that they could inspect the small pair of scissors I traveled with. Women wearing headscarves—ethnic Uighurs and practicing Muslims—were made to remove them before passing through the security check. While the security apparatus enacts a singular cut between unsecured and secured space and individuals, there are nonetheless diffractions along that boundary. The apparatus also realizes gendered and ethnic fracture as well, as Uighur women are both marked as different and allowed to circulate through rail space, simultaneously part and not part of the Chinese citizenry. The jarring fracture between securitized rail space and the rest of Xinjiang stands in stark contrast to the more permeable boundary found in the heart of Shanghai or Beijing. The internal coherence of rail space exposes interregional fractures.

Conclusion

While rail has a long history as a site for state-making in China, the introduction of the real name system has integrated rail travel into the state's production of citizenship and state territory to a novel extent. Computerized ticketing realizes a radically different spatiality: tickets to destinations across China are always at the fingertips of would-be travelers. The real name system is also instrumental to the realization of rail space as an

enclosed interior secured by the force of the state against thieves and terrorists alike. These apparatuses lend a pragmatic relevance to the *shenfenzheng* identification system, turning mobility into a de facto right of citizenship. Yet integrating rail travel and citizenship produces complications for state conceptions of citizenship—the old and the technically inept are marginalized, non-citizen residents of Hong Kong and Macau are reminded of their exclusion every time they buy tickets to the mainland, and the millions of unregistered Chinese are rendered yet more invisible.

As a Baradian apparatus, the rail system doesn't compel passengers' actions, but creates a physical arrangement that realizes them as agents whose actions contribute to the production of the whole. Their legibility to the Chinese state is produced not through the application of discipline and control, but by taking a hold of their "natural" desire to travel and acting on it in such a way as to bring its fluctuations in line with the intentions of the state. Insofar as the rail system is a panopticon, it is premised not upon mechanisms of discipline but of security.

This article synthesizes Barad and Foucault together to open up not the discourse of the rail system but its reality: the ways in which rail reshapes China's geography and society both conceptually and in practice. At issue with the unequal access to rail mobility is not simply a perception of discrimination or the production of discourses of racial and class hierarchies. These concepts emerge from the pure naked empiricism of the reality that some are discriminated against within rail travel, it does cater to some passengers over others, and that hierarchies of ethnicity and class really shape who can move through which places both within rail space and through the country as a whole. This is the context within which more overt manifestations of state power within rail

space must be analyzed. When the Chinese government forbids petitioners, debtors, and others with “bad social credit” from the rail system, this is the field of power within which they are acting (“China to bar people with bad ‘social credit’ from planes, trains,” 2018). This vantage illuminates the profound role of a range of banal social practices in shaping social reality.

CHAPTER IX

CONCLUSION

In this dissertation I outline an approach to nation that is more-than-human, that foregrounds how everyday, affective encounters between people and non-human things cohere into larger assemblages of culture and community at the national scale. While infrastructures of media or education may play a more prominent role in shaping national identity, transportation infrastructure is directly involved in the production of national space. I investigate the contemporary rail network in China to take a narrow but broad cross-section of this more-than-human nation's spatial extent. While mindful of the impacts of rail development on the nature of the national geo-body, my principal research interest is in the interiority of rail space. I examine how the practices of passengers are shaped by and come to depend on a certain suite of infrastructures, standardized at the national scale; at the same time, I attend to the emergent fractures between different practices and spaces within rail space.

In the introductory chapter, I develop the concept of more-than-human nation as employed in this project, situating it relative to the scholarship of more-than-human ontologies, state theory and nationalism studies. In Chapter II, I situate this study of the contemporary Chinese rail system as a more-than-human assemblage within the scholarly context of Chinese studies. I show how this conception builds on previous studies of the Chinese state and nation, offering novel insight into China's complex internal tensions. Chapter III presents the methodology from which this project emerges. I draw together methodological innovations from geography, anthropology, and science and technology

studies to conduct my research into the affective, embodied and material dimensions of nation-ness within Chinese rail space.

Chapter IV takes the theoretical framework of more-than-human nation assembled in the previous chapters and examines how it is encountered in the everyday practice of rail travel. This chapter traces the passenger's journey through the rail system, from the moment the journey is imagined to the moment of arrival. Synthesizing empirical observations of rail space from my fieldwork, this chapter also situates the rail assemblage vis a vis other assemblages that structure China's contemporary society such as the *shenfenzheng* and WeChat. This chapter illustrates how many elements of rail space and the complementary skills trail passengers home, subtly articulating them into the rail system—and situating them within a national space—even after the journey is complete.

Chapter V situates the rail network as an instrument of the state, a tool for shaping space and imaginaries of space. This chapter's analysis of the discourses around the XRL project between Guangzhou and Hong Kong shows that not every mainland discourse of rail infrastructure is identical: Guangdong portrayals of the XRL's impact differ from Beijing's view in subtle but important ways. For the purposes of this dissertation, the most significant of these differences is the role of things: the concrete specificities of border control, travel documents, and carriage design loom larger and play a more complex role in the pages of regional newspapers. This chapter shows how material infrastructure is mobilized in service of state discourses, but rather than serving as a transparent medium, it always introduces novel and contingent complications.

Chapter VI identifies and critiques a distinctive tension in how scholars conceptualize nation and state as social abstractions and suggest how a greater attention to infrastructure can resolve that tension. Nation and state are regularly taken for granted as units of analysis for social science, yet elsewhere—particularly among theorists of nation or state—they are understood as essentially figmentary: as reifications rather than actually existing structures. While critiques of simplistic conceptions of nation and state have made substantial contributions to our understanding, I argue that an overemphasis on the ways nation and state fail to explain social phenomena conceals the real though limited ways in which nation and state integrate society and space. I draw on the concept of boundary object from the work of Susan Leigh Star (Star 2010; Star and Griesemer 1989) to put forward a framework capable of theorizing both the coherence of and the fractures within nation and state—and also to examine how the two are linked. I draw on empirical data from my fieldwork concerning the historical development and contemporary social character of the hot water taps omnipresent within rail space to demonstrate how this framework can be applied.

In Chapter VII, I situate the skills of rail travel within the larger conversation about culture and social class in China. Rail space is a microcosm of Chinese society as a whole, with passengers from a broad range of regional backgrounds, ages, genders and socioeconomic classes brought into intimate contact. It is therefore a site where debates over social quality, as captured in terms such as *suzhi* (quality) and *wenming* (civilization) are made concrete. I argue these qualities are not simply passively embodied, but actively, skillfully practiced; moreover, I argue become entangled with the spaces in which they are practiced. In rail space, civilized-ness is practiced through how

they pass the time, what and how they eat and drink, and stations and carriages are full of educational media intended to actively shape how people behave in rail space. I use this analysis of social quality to reframe the advent of HSR in the early 2000s as a response to a crisis driven by the long-standing association between conventional rail and low income, low "quality" passengers. The advent of HSR helped retain the higher-income, high *suzhi* passengers who were transitioning to air and car transportation not only through increasing speed, but creating a rail space of greater "quality."

In Chapter VIII, I examine how the apparatuses of ticketing and security realize state conceptions of citizenship in the everyday lives of passengers. I critically re-read the theory of Karen Barad (2007) against the later work of Michel Foucault (2008; 2009) to the rail system as a "circulatory panopticon," a socio-technical, material-discursive apparatus of security driven by population flows. I show how the apparatus of the contemporary Chinese rail system realizes certain conceptions of citizenship, through two dramatic shifts in the regulation of rail passengers and spaces in the past decade: the computerization of ticketing and the securitization of stations. The real name ticketing system requires that passengers actively produce themselves as legible citizens before purchasing tickets. Securitization further requires passengers to produce themselves as legible and safe, producing the interiority of the rail system as a bounded, secured space. Barad's notion of diffraction, however, enables a productive examination of how these boundary-making apparatuses also produce a range of not-quite citizens, and not-quite secured spaces inside and outside of the rail network. Synthesizing Barad and Foucault makes clear the ontological stakes of new materialist theories: it is not a question of

prioritizing material over discourse, but of theorizing how both come together in the production of reality.

Each of these articles leverages the concept of the more-than-human nation to shed light on the relation between humans and non-humans in the production of social space. Hot water taps show how state projects give rise to national habits; cellphones and instant noodles become battlegrounds for struggles over class; apparatuses of ticketing and security enact exclusionary cuts between citizen and non-citizen in everyday life. Together, these articles demonstrate the power of more-than-human methodologies to produce nuanced accounts of the interplay between coherence and fracture in politics and culture.

Towards a More-Than-Human Nation

This dissertation comes at a moment of transition in the study of the nation. Long dominated by the study of discourse and subjectivities, in recent years scholar of nationalism have turned towards the investigation of the nation's affective, material and more-than-human dimensions. Moving from banality to the everyday, scholars have inquired into how nation-ness shapes atmospheres and bodily comportment at a visceral level far removed from the self-conscious articulations of nationalism. This new conceptual vantage research has been facilitated by the concurrent development of new qualitative methodologies geared towards capturing the fleeting traces of performance, affect and atmosphere. This dissertation advances this research agenda by integrating theoretical and methodological insights from science and technology studies, anthropology and geography. Centering questions of mobility and infrastructure expands the scale of inquiry into nation-ness from the body and neighborhood to the national

scale; attending to non-human infrastructure situates the everyday and affective within the richly populated materiality of the built and natural environment. The greater attention to materiality brought by a more-than-human conception can be a useful corrective for the tendency of affective methodologies to emphasize the felt at the expense of the real. As Haraway (1988) and Barad (2007) make clear, qualitative research grounded in situated, bodily knowledges do not have a lesser claim on reality than seemingly objective, quantitative research. Affective and material methodologies typically remain distinct within human geography; bringing them together will allow geographers to investigate human and non-human side by side.

The concept of more-than-human nation presents researchers with an object of study encompassing the entirety of the Ingoldian relation between person, things, and place (Ingold 2002; 2011). Bringing the built environment into the nation, rather than as backdrop, can serve to re-invigorate historical studies of how infrastructural development acted to build nations at their origin, and pushes contemporary research to uncover how infrastructures of mobility (Edensor 2004; Merriman and Jones 2016), media (Edensor 2015), education and employment continue to constitute vitally important terrains of struggle for different conceptions of the national community.

This dissertation draws extensively on science and technology studies literature on the ontology of a more-than-human world. I aim to contribute back to STS a greater attention to the importance of nations in the production of science and technology. Nations are taken for granted in STS: they bound the unit of analysis, but are not themselves analyzed (i.e. Hecht 2009; Latour 1999). This dissertation contributes to the argument that science and technology are central mechanisms for nation-building

(Jasanoff 2004; Jasanoff and Kim 2015; Van der Vleuten 2003). Investigating how technological change shapes society sheds invaluable light on how scientific knowledge circulates within and shapes publics at the national scale.

Of course, the national scale is only one space within which flows of people and things constitute more-than-human assemblage. A more-than-human lens guides research to the points of entanglement between infrastructure and communities that both integrate and fracture society. As Chapter V's examination of the XRL shows, the more-than-human analytical framework presented in this dissertation can also be used to investigate how infrastructure constitutes and is constituted by culture at urban, regional and even global scales, examining spaces of mobility from urban metro systems to the global networks of air travel.

Chinese Rail Space Going Forward

This dissertation argues that the rail network is a site where Chinese-ness is both enacted and transformed. I show how the advent of HSR has split in two what was once a single shared social space, reproducing in microcosm the broader political economic trajectory of contemporary China. Yet my research also finds that the Chinese rail system is in a period of rapid transformation: will these divisions endure or fade with time?

This dissertation shows that major components of contemporary rail space that dramatically rework the experience of rail travel have their origins less than a decade in the past. Yet the particular more-than-human assemblage I encountered in my fieldwork and describe in this dissertation has already begun to transform in significant ways. By the end of 2019, pilot projects allowing passengers to use their cellphones and *shenfenzheng* identification cards in place of physical tickets passing through security and

boarding were rolled out nation-wide (Junwei Wang 2018). In 2018 people accused of certain crimes were officially forbidden from rail and air travel, putting the real name ticketing system to work in a novel way (*Reuters* 2018). This new policy foreshadows the ways that China's nascent social credit system, currently being piloted in a number of cities, might be combined with the apparatuses of the rail system to develop new state capacities to intervene in the everyday lives of citizens in unexpected ways.

This dissertation also contributes to discussions regarding the impacts of rail development on China's national and regional economic geography (Chen et al. 2019; Wang et al. 2016; X. Jiang 2017). Studies of the current network show that HSR has contributed to increased disparities in accessibility (Jiao et al. 2014), though also suggesting that future construction directed towards densification rather than expansion will somewhat alleviate regional and urban disparities (Jiao et al. 2014; L. Wang et al. 2016). This dissertation contextualizes these quantitative analyses at the ground level, showing that increased intra-national disparity has a meaningful impact on the experiences of passengers. Concretely: my fieldwork suggests that beyond the question of access, frequency of departures greatly affects how passengers use and think about the rail network. Quantitative analysis of stops per station per day would reveal a different pattern of integration and exclusion, one highlighting gaps between hubs and mid-line stations.

The city-wide 2019 protests in Hong Kong mark a dramatic turn in the narrative of Chinese rail. The opening of the XRL, while hailed as a unifier both locally and nationally, was greeted quite differenty on the other side of the boundary. It is hard to imagine that the XRL's grand opening in 2018 is wholly unrelated to the 2019 protests:

as Xia (2016) shows, the anti-XRL movement was a formative moment for distrust of the Hong Kong government and the political mobilization of a Hong Kong identity. The joint checkpoint agreement was hard fought by pro-democracy activists and politicians (Lum 2018). During the protests, the infrastructure of the MTR, dubbed "Party Rail" (党铁 *Dang Tie*) by protesters for its apparent mainland loyalties, became a frequent target of attack (BBC News 2019-09-18). In one instance, a China Railway train passing through a station in Hong Kong was physically attacked by protesters (Yau 2019). If the link between citizenship, national identity, and rail travel is mutually reinforcing within the mainland, the Hong Kong example suggests that the relation does not necessarily hold outside of the Chinese legal and political context: that in some cases, the nation-building force of rail can be dramatically inverted.

This question concerning the social character of Chinese rail infrastructure is also especially timely in light of the Belt and Road Initiative. Chinese rail has gone global, with Chinese-built—and it seems Chinese-operated—railways opening in Ethiopia, Kenya and Djibouti. A line from Kunming into Laos is currently under construction, and numerous other rail lines are in various stages of planning. The Belt and Road Initiative is not the first time rail development has figured in Chinese foreign relations: in the seventies, Chinese railway engineers built the "Freedom Railway" in Tanzania as a show of international solidarity and Chinese national might (Gao 1997; Monson 2009). My dissertation suggests that the particular character of Chinese rail space is deeply interconnected with Chinese-ness writ large; how will these practices manifest when the infrastructures they are embedded in travel abroad? Research on the social dimensions of Chinese infrastructure abroad, not just railways but roads, dams and mines, can shed light

on one of the central debates over China's global infrastructure push: are Chinese investments a new form of South-South cooperation or neo-imperialism with Chinese characteristics (Carmody 2013; C. K. Lee 2017; Shambaugh 2013)? Moreover, it can shed further light on Chinese-ness, constituting another site where the invisible interdependence between infrastructure and its communities of practice are disrupted. As Ching Kwan Lee (2017) argues, studying "China beyond China" sheds as much light on China's domestic situation as it does on Chinese investments abroad. BRI infrastructure provides a new point of entry to the investigation of the ways the Chinese built environment assumes a certain kind of subject, a certain geographic context, and a certain relationship with the state.

This dissertation aims to trace the outlines of a new kind of entity: a nation of both people and things, infrastructures and communities. In doing so it pulls together intellectual threads from across the social sciences, fostering new dialogue between fields that have long been siloed away from each other. My hope is that this dissertation, and the notion of the more-than-human nation, functions as a connecting node in a fractured scholarly network, enabling ideas to flow and bringing distant intellectual territories into more intimate contact.

APPENDIX A

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NFDSB. 2018-09-24. "A 19 Minute Leap." 19 分钟的跨越. AA01.

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APPENDIX B

PROJECT APPROVAL FROM HUMAN SUBJECTS PROTECTION PROGRAM, UNIVERSITY OF OREGON, 2017-2019

UNIVERSITY OF OREGON

DATE: May 25, 2016 **IRB Protocol Number: 05122016.025**

TO: Dylan Brady, Principal Investigator
Department of Geography

RE: Protocol entitled, "An Infrastructural Approach Towards the Emergence of Chinese National Territory"

Notice of IRB Review and Exempt Determination
as per Title 45 CFR Part 46.101 (b)(2)

The above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that qualifies for an exemption from IRB review under 45 CFR 46.101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

Please note that you will not be required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire May 24, 2021. Should your research continue beyond expiration date, you will need to submit a new protocol application.

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

Sincerely,

Kalindi Allen
Research Compliance Administrator

CC: Daniel Buck, Faculty Advisor

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS • RESEARCH COMPLIANCE SERVICES
677 E. 12th Ave., Suite 500, 5237 University of Oregon, Eugene OR 97401-5237
T 541-346-2510 F 541-346-5138 http://rcs.uoregon.edu

An equal-opportunity, affirmative-action institution committed to cultural diversity and compliance with the Americans with Disabilities Act

UNIVERSITY OF OREGON

DATE: March 14, 2017 IRB Protocol Number: 05122016.025

TO: Dylan Brady, Principal Investigator
Department of Geography

RE: Protocol entitled, "An Infrastructural Approach Towards the Emergence of Chinese National Territory"

Notice of IRB Review and Exempt Determination-Amendment
as per Title 45 CFR Part 46.101 (b)(2)

The amendment submitted on March 08, 2017 to the above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that continues to qualify for an exemption from IRB review under 45 CFR 46. 101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

Please note that you will not be required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire May 24, 2021. Should your research continue beyond expiration date, you will need to submit a new protocol application.

The purpose of this Amendment is to:

- Add transcription

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

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Christina (Davis) Spicer, J.D., C.I.P.
Research Compliance Administrator
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APPENDIX C

JOURNAL STYLE REQUEST FORM

In the following chapters of my dissertation, I intend to include chapters formatted in journal style. I request permission to use the style of the journals listed.

CHAPTER VI: Between Nation and State: Boundary Objects, Infrastructures and Communities of Practice in the Chinese Rail System

Journal: *Environment and Planning C: Politics and Space*

Style: SAGE Harvard reference style

CHAPTER VII: Being a Chinese Passenger: Practicing Quality and Civilization on the Rail

Journal: *cultural geographies*

Attached: "Humane" reference style

CHAPTER VIII: The Circulatory Panopticon: Rail Infrastructure as Citizenship-Realizing and -Diffracting Apparatus and Foucault's Realist Turn

Journal: *Political Geography*

Attached: *Political Geography* reference style

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