

## AFTERWORD

### Infrastructural Futures

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When I was younger, I attempted to ride a bicycle from Bangkok to Europe. My plan was quickly frustrated by land borders between Thailand and Burma that were closed to me. I learned then that Southeast Asia and South Asia were, in some ways, disconnected. This disconnection was borne of imperial and postcolonial politics. I flew from Bangkok to Calcutta and started to pedal west through the paddy fields and brick-kiln smoke of the Bengal winter. The road was a single strip of tarmac with broad, dusty edges. The surface was rough, potholed, and (to my eyes) unfinished, with the tarmac crumbling into rutted strips of compacted mud. The traffic was wild and unkind, the air dusty and acrid. I clearly recall how many of the roads I took had distinct shapes, cambers, and curvatures. In much of India roads were lined with trees, their trunks painted in regular bands of white and red. Signs, milestones, and paint markings had culture. Junctions had familiar angles, and the superstructure of government accommodations, where cyclists could stay at unfathomably little cost, had an architectural feel and style that spanned across great regions.

A quarter of a century later, I am still followed by the roads I took then. I have learned as an academic how those roads and side spaces got there, and why they took such varied forms over many kilometers in India, Nepal, Pakistan, Iran, and Turkey. I now know that these were not just incidental shapes in the landscape, but that they were given form by history, bureaucracy, and diplomacy. In the 1990s, when I was cycling, infrastructure was most clearly a product of postcolonial institution and nation-building, of technical cooperation between India and a host of competing Cold War friends, and of the now faded efforts made by the United Nations to make new regional alliances in the decades after World War II.

My subsequent research career allowed me to understand how the road in South Asia took on such distinctive shapes: the shapes of colonial rule, Cold War struggle, and the tenacity of road engineers. The single strip of tarmac and compacted mud emerged from decades of trial and error. It was not an accident, or an engineering effort that ran out of money; rather, it had been an important nationalist project. Engineers and scientists had been employed by the nation to test,

experiment, and come up with solutions for a road network in India. They look back on their work as service to and sacrifice for the nation—sentiments not to be taken lightly. The design allowed India to move at different speeds, with trucks and cars occupying the fast-moving center ground, and pedestrians, carts, and bikes on the soft shoulders. Throughout the twentieth century, the idea of a country moving at different speeds was vital for those with an interest in planning and building roads. Now, of course, the road that leaves Kolkata (not Calcutta) is four lanes of fast highway, built to a different set of hybrid standards.

Chapter 8 in this volume, by Till Mostowlansky and Tobias Marschall, describes with great precision and familiarity scenes similar to my own youthful impressions of roads in South and West Asia. Focusing on the chronology of road-building and the relationship between main and lesser routes produces an enchanting palimpsest of meanings and textures beyond those given by the original constructors. Different “projects of modernity,” as the authors call them, are fundamentally interconnected and part of a web of routes through which people and institutions interact.

The only map I carried on my bike was a line drawing of West Asia torn from a guidebook (published in the series founded by Tony Wheeler). I navigated with a compass, and although I preferred smaller roads, I repeatedly found myself on the trunk routes that gave the continent a skeleton. Most of these major highways were then still tolerable for a cyclist, but I preferred to be in the wilds—away from trucks, overly strong tea, and the civility of indifference that tends to form among people who remain in places where others are always coming and going.

Some of the main routes, however, seemed impossible to avoid. They drew the traveler back no matter how determined the attempt to escape. Sometimes there were no other roads. More commonly, these roads occupied the easiest paths through difficult landscapes, the paths of least resistance, as people had discovered or worked out many centuries earlier. These were the grand trunk routes of the subcontinent, where people have moved in ways that long predate any modern political or national formulation of territory.

At the time, I knew little of road networks, engineering, or intergovernmental agreements. I do, however, vividly recall rusting signposts pointing to cities many kilometers and several countries away, road numbers that were out of kilter with national numbering systems, and the conspicuously engineered and built-up border crossings between India and Pakistan, Pakistan and Iran, and Iran and Turkey. I later learned that there was an intercontinental vision that had flourished briefly in the 1950s and 1960s in the aftermath of World War II. Interestingly, that project had been quickly taken over by prior geographies: the divisions between Europe and Asia, Iran and South Asia, and South and Southeast Asia.

Utopian road visions designed in an era of reconciliation and reconstruction were unable to defeat older, partly colonial notions of national and regional identity. The terrain mattered; it was not all about the social or imperial construction of space or the artificiality of borders. These roads ended up, despite the best intentions of the so-called diplo-engineers who put them there, as agents of older borders rather than forces of geographical liberation and free movement. National will and international animosity were more powerful than the leveling magic of the road.

The chapters of this book remind me of the map I carried on that cycling trip. They skip across Asia (with a superb detour to West Africa), leaving a spread of graphic images marking the complexity of infrastructural ambition, vanity, and enterprise. They take us into the structuring structures of how things were, are, and might be. These are sharp and arresting accounts that force us beyond numbers and headlines, into the details of particular projects and questions of scale and time. Together, their conclusions collectively bump forward our understanding of how the intentions and consequences of infrastructure come together.

Importantly, together, the chapters bring all manner of infrastructure into the same frame. The result of reading the volume cover to cover is an appreciation of the qualities of infrastructure that make it so fascinating to write and think about. When in and close to it, infrastructure is encompassing. It fills the frame and has an alluring and totalizing logic—both as a political object that can be sold, and as an object of analysis for an academic. But when juxtaposed chapter by chapter, place by place, project by project, infrastructure begins to appear as vulnerable and somewhat random. It loses its seductive logic and all-encompassing rationale.

Scale is put on display in this collection, and the pedestal is supported by some foundational ideas from the literature. First, infrastructures are concrete manifestations of abstract ideas about the world. Second, infrastructures carry with them symbolic power, produce awe, and have uncanny abilities to represent the interests of all manner of political ideologies and aspirations—left, right, state, private, developmental, colonial, and so on. To put it another way, a command economy might build infrastructure to strengthen the nation, and a free-marketeering government might argue that infrastructure facilitates economic growth. Both, in the final analysis, build roads with remarkably similar materials and qualities, which begs an old question: is state ideology an interpretation of the infrastructure imposed on nature, or is infrastructure an interpretation of state ideology?<sup>1</sup>

There is more to it than that, of course, but this simplified diagram is useful because it clears the way for seeing that different forms of political or cultural organization, rather than inhabiting entirely different worlds or ontologies, often have a great deal in common—though that commonality may be disguised by

bluster, boosterism, marketing, the mystification of progress, the division of people into left or right, and the competitive wealth of nations.

I finally found my way to the pleasant task of writing a brief commentary on this book after a year of frantic lockdown teaching online. Among other things, I had read the latest and “hottest” literature on infrastructure and climate change with postgraduate students. We read Bruno Latour (2017a, 2017b, and 2018)—who provides a breathtaking roller-coaster ride through the Anthropocene and into Gaia—all the time haunted by those irritatingly catchy words “We have never been modern,” from the title of the treatise (1993) in which he attempted to reconnect the social and natural worlds by arguing that the modernist distinction between nature and culture never existed. In other words, it would be more useful to consider ourselves amodern or non-modern.

Latour has subsequently applied his thought to climate change and, continuing the reconnecting theme, has argued against distinctions between natural and human history (the Anthropocene). More recently, he has seen the potential in the idea of Gaia as a sort of meta-category into which everything can be collapsed and distinguished all at the same time (on this knot, see Latour 2017a). Gaia was initially the idea of the unorthodox scientist James Lovelock, who attributed a force or agency to the earth greater than that of any single element or feature. A lot has been written for and against the concept, which need not detain us (but see Aronowsky 2021 for a subtle yet devastating account). We read a spirited and witty critique of Latour’s climate change social science by Andreas Malm (2018), who takes Latour to task for—excuse the brevity—his bourgeois intellectualism. Malm is of the view that it is politically irresponsible to collapse the categories of nature and culture if we are to understand how climate change happened, who is responsible for it, and what solutions might be. We also read of other scholars’ disappointment in Latour for not acknowledging the many indigenous cosmologies that they saw as resembling Latour’s version of Lovelock’s version of Gaia (see, e.g., Whyte 2017).

Then I came to this volume, which abruptly made me ask with new clarity: Who has never been modern? Who is the “we” of Latour’s famous title? And, more importantly, what about the rest of the world? What about those who neither inhabit scientific laboratories nor claim an indigenous stake? What about Asia?

Reading Latour suggests new and revolutionary intellectual possibilities. I think it fair to say that the manifesto is not quite there; glimpses of the possibilities tend to be fleeting, rather than permitting a long, hard stare. Sometimes, students felt that they were reading about a new paradigm, a new way of organizing thoughts and possibilities. At other times, we asked: what kind of social science is this? Latour is arguing that we inhabit the world in ways that we do not

properly understand, rather than telling us how other people understand the world. In this volume, there are lots of references to people who are trying to be modern, who embrace wholeheartedly the categories and ambitions that Latour discourages. And while Latour might be inspirational on many fronts, the absence of most of the world from his analysis and the absence of a guide for how to transition from being modern to seeing Gaia are frustrating—not least because his climate project stands a chance only if it engages with Asia. This lack of engagement has implications on a truly planetary scale if, as Mia Bennett argues in chapter 1 in this volume, China has become a geological agent in the Arctic.

Imagine a new subfield with a focus on why academics study what they do. The discipline would sensibly draw on the methods and approaches of history and political economy; on institutional behavior; and on the relationship among politics, publicity, and practice. At the core of the discipline, there would probably be stiff competition to theorize how the world works—quite possibly, given that the stakes are close to home, in a less schematized form than has been routine. The guiding questions of the endeavor might be: Why and how do academics write about some things and not others? And why do some topics become fashionable and gain what we might think of as momentum?

In academia, there might be pockets of exceptional intellectual force that produce something spontaneously original. For the most part, however, scholarship seems, in both structures and practice, to reflect a slightly lagging zeitgeist—a game of catch-up, only gradually apprehending and critically engaging with the consequences of decisions made elsewhere and in times past. This lag is particularly evident in the social sciences, where a chief aim, as I have understood it, is to render with words social realities (however defined). In a practical sense, the planning, questioning, analysis, and writing of research takes time, which places those with faith in empirical evidence behind the curve of the now.

However, my point has less to do with the mechanisms of research and more to do with the ideologies and meta-structures that place ideas in the minds of individual researchers. This emplacement and legitimization of research agendas seems to take time. For example, after climate change was first identified and discussed at global summits, it took four decades for the issue to become a research priority for many institutions. The study of infrastructure seems to have had a similar incubation period, which begs two refining questions: Where might the study of infrastructure come from? What do we anticipate being able to render with words through the study of infrastructure?

There has been a tremendous flourishing of literature on infrastructure in the social sciences. This academic effervescence has already developed a canonical set of citational conventions, with roots in the works of Susan Star (1999) and Geoffrey

Bowker (Bowker and Star 2000), followed by now-ritualized nods to Brian Larkin's (2013) *Annual Review of Anthropology* article. Along the way, some older favorites have been dropped (such as Darian-Smith 1999), perhaps only because the authors' names have not been chanted with sufficient regularity to keep their memories alive.

Infrastructure allows researchers to explore some of the enduring themes of social science: the operation and nature of power, the spread and pursuit of influence, and the ways in which abstract ideas are made into concrete realities. In practice, such studies have generally come to rest at the point of midlevel theory that explores state processes, evolving ideas of governance, dispossession through accumulation, and so forth. The orders and standards of infrastructure are shown to be entangled with the world in multiple ways, their effects rebounding in multiple directions. The general drift of the literature is to start with the surety offered by stereotypes or collective representations, and gradually to unfurl that surety in the winds of ambiguity, rupture, and contingency.

One of the most common effects of this strategy is the demonstration of how infrastructure collides the plan with the contingencies of the world. In the wake of this collision, there are frequently unexpected and unintended consequences. Generally, the plan of infrastructure (broadly conceived of as materials, documents, and political processes) is relatively clear and accessible to researchers. This is, in my view, one of the reasons why infrastructure has become so popular in the social sciences. Infrastructure often comes with a ready-made narrative of what it will do, why it is needed, how its projects will be managed, and what it will look like. There is also often understanding shared among producers, consumers, bystanders, and researchers that readily translates into academic text. Put differently, infrastructure is relatively easy to write about when compared to phenomena such as, for example, freak weather events or the onset of famine.

The just-so narratives of infrastructure can then be compared to the lived worlds of infrastructure builders, scientists, and those living alongside infrastructure to show how the two differ. To paraphrase a well-known anthropological axiom, what they wrote that they do is not the same as what they do. This revelation is such a well-developed strategy in the social sciences that I hope the caricature can be forgiven. In many ways, however, it reminds me of older, open debates in anthropology on the epistemological and methodological relationship between texts and practice in the study of religion. Generally, what was written in religious books turned out not to be the same as what people said was written in religious books, and both were often quite different from what people did on the ground. The pendulum of the debate has swung back and forth between texts and practices to settle most satisfactorily on the ideas that people came first, and that what they

thought—however syncretic, heterodox, or ignorant—is the most productive research focus.

The invention (Hildyard 2016) or reinvention (implied by Bear 2020) of infrastructure as an asset class over the last half of the twentieth century has gradually rippled out from financial institutions and into the world, to governments, consultancies, engineering firms, chartered accountants, and publicists. In South Asia, for instance, publications have emerged on electricity, water, mass transportation, and urban modernization projects, to name a few. On the whole, these publications are live, fresh, and exciting, and set the tone for the study of the region. These various areas have become the focus of specific forms of public and private investment and experiment, and have become associated with particular institutions, modernization programs, and personalities. Researchers have followed the action, so to speak, as International Monetary Fund and World Bank policies (themselves part of a longer history of global elite economics) go on to create new formations, vocabularies, markets, and ways of doing things.

Chapter 10 in this volume, by Max Hirsh, brilliantly illustrates the way the world of consultancy, technical collaboration, and contract allows ideas and conventions to be made real over time. His focus is on the emergence of the China Model and the coproduction of airport architecture and aviation technology on a global scale by Chinese, American, and European interests. He shows how China took certain ideas from these historical interactions and parlayed them into political projects focused on urbanism and development—not least the China Model itself, a sort of mega-brand for all manner of infrastructural development and, of course, part of a political vision for how the world should be organized and by whom.

Elsewhere, interest in infrastructure comes decades after the implementation of structural adjustment policies and the fundamental marketization of South Asian economies. I would suggest therefore that to study infrastructure at the next level (beyond just comparing text with practice) is to focus on a way of making the world anew, rather than infrastructure being the ultimate end. For the development banks, for example, the conditions placed on a loan are the primarily transformative mechanism, rather than the bridge or mass transit system for which the loan is made—just as the China Model aims to bring about a certain form of political and economic dominance in which bridges, roads, and airports are the means rather than the end goal.

In infrastructural terms, despite decades of technological innovation, there is currently no plausible universal alternative to electricity to make televisions light up the lives of billions, nor is there a substitute for water for drinking and irrigation. Mass mobility by air, sea, or land requires the use of energy—usually from

planetary hydrocarbons—to overcome the friction and resistance of the earth (using the earth against itself, so to speak). Infrastructure's broadest strokes remain elemental and rather straightforward: food, water, heat, and movement, in various degrees of elaboration.

To remind you where we have been on our journey in this volume, in chapter 2 Andrew Toland describes a temporal game at play in infrastructural thought—itsself, arguably, another infrastructural affect. Infrastructure comes with plans for maintenance and upgrades, as well as with plans for its destruction or phased obsolescence. Step back from the frenzy of construction and now-ism, and infrastructure is never forever: it crumbles and breaks, and, importantly, it is rendered obsolete and outmoded by technocrats, standards, and incumbency. The lesson? Step back.

Part of the nationalist story in Singapore is a determined game of catch-up with the rest of the developed world. Now that Singapore has overtaken much of the rest of the world, its government works to stay ahead of other countries. National entrepreneurship transformed the natural ecology of swamps and seawater into the more valuable ecology of oil. The lesson? Belief in modernity and progress is widespread and carries tremendous popular appeal as a political project.

We also find a leapfrogging metaphor in Gökçe Günel's account in chapter 3 of floating powerships off the coast of Ghana. Temporary power infrastructure enables a vision of transition, linear development, and future progress. Here, the temporal metaphor of progress is twofold: First, temporary power infrastructure comes with the promise of its own obsolescence, enabling a belief in the possibility of leapfrogging to clean energy. Second, powerships bring with them ideas of progress in relationships between Turkey and sub-Saharan Africa. These are the fundamental and related ways of thinking that infrastructure allows: temporality and the narrative of progress. Importantly, these are not the metaphors of the Anthropocene or of Gaia, but of the moderns.

This volume engages with both the social production and the consumption of infrastructure. In these arenas, it is clear that geopolitical plans, the zeitgeist, and innovation engage with each other through infrastructure—interconnectedness, as Anto Mohsin has it in chapter 4. Infrastructure has agency that, once inaugurated or unleashed, will influence ideology, culture, and society.

In chapter 6, Hallam Stevens describes the paternalistic infrastructure of Television, and its symbolic and practical importance in driving Singapore's economy and maintaining the government's political legitimacy. This infrastructure is designed to assure citizens that their government is taking adequate care of their needs and the nation's future. In cables and screens there is state power, but, importantly, there is also wisdom and beneficence.



In chapter 5, Dorothy Tang argues that the politics of freshwater infrastructure in Hong Kong are rooted in the coproduction of its landscape and water scarcity. Modernity and infrastructure are created by mediating nature across multiple scales and across time and social organizations. One pet project of the moderns is to control nature and manage the environment. These moves necessitate forms of infrastructural intervention that, in turn, produce a distinct experience of modernity, such as the infrastructure spaces in Gui'an described by Tim Oakes (in chapter 7), and in the urban transformation in Ho Chi Minh City described by Jessica Lockrem (in chapter 9).

The deconstruction of the infrastructural mystique is an important political move, not simply to demonstrate the power of the social sciences in a science-dominated world, but also to show what is at stake in an era of climate change that is disguised by the struggles of geopolitics. The words and sentiments used to describe the infrastructure of modernity in this volume have histories rooted in the colonial experience and in the myths of endless growth and national competition. Scholars can demonstrate, largely to themselves, how hollow such ideas are, but that is inadequate. These ideas are the forces that are driving the world, largely through the creation of infrastructure that will have carbon multiplier effects. This is the language of climate change in Asia. When the government minister responsible for roads in India, Nitin Gadkari, stands up (as he often does) and announces his intention to build fifty kilometers of four-lane highway every day from now until 2050, he provincializes the intellectual climate project I have associated with Latour.

The end goal of most infrastructure is remarkably basic, and usually an elaboration of a bodily or social need. However, the obstacles to seeing what is what are extremely complex and multilayered. Seeing through these opens the door onto one of the most pressing questions of the time: how to calibrate resource equality and responsibility in an era of climate change.

I claimed above that infrastructure has qualities and spatial configurations that lend themselves readily to academic description and allow us to plow to a certain depth. Perhaps it is precisely because of such user-friendly qualities that infrastructure is also very hard to unmask: it has characteristics that excuse or absolve it from blame in an era of climate change. Most infrastructure is made to appear both as something necessary and as progress. Infrastructure encodes the logic of development discourse, nation-building, and economic growth, and, as many of the chapters in this volume illustrate, that logic becomes totalizing and exclusive. Thus, there is a need to step back and understand what it means to leapfrog.

Infrastructure excludes the conceptual armature for dealing with questions of climate change. Global construction companies brand their products as resilient,

sustainable, and even green—a genuine case of greenwashing. The emphasis on representation and discourse within the social sciences has forced evaluative and prognostic questions into the wings of analysis. The Anthropocene has become a central concept in the social sciences, appearing in this volume as the “Sinocene” in Bennett’s chapter on China as a geological agent. Will the recognition of the Anthropocene save us? There is little doubt that the interplay between human and natural history (Chakrabarty 2009) and the debate about the relationship between parts and wholes (as refracted through Gaia by Latour 2017b, and through debate and reason by Morton 2018) are vital moments of rupture pointing to a paradigm shift within the epistemological politics of the social sciences.

Along the way, this volume asks us to recall political and scalar specificity in identifying and critiquing geological agency. As I have briefly discussed, some scholars have questioned the rights of our scholarly giants to speak the lives of others, and Indigenous voices are well represented in this critical literature. A rather grubbier and more pressing reality is that the conceptual collapse of modernity is a parlor game that can be played in Paris or Chicago, but whose premises look somewhat misplaced by the time you are floating off the shore of Ghana on a ship recycled as an electricity generator or building roads in rural Afghanistan to make the journey to the nearest medical facility less life-threatening.

## Note

1. Here I am inspired by Christian Wolmar’s (2016) explanation for the lack of transport policy in Britain. Wolmar rhetorically asks, “Are trams socialist?”

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