

*Review Essay*

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**Water, Infrastructure and Power: Contention and Resistance in Post-colonial Cities of the South****Geoff Goodwin**

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**Nikhil Anand, *Hydraulic City: Water and the Infrastructures of Citizenship in Mumbai*. Durham, NC, and London: Duke University Press, 2017. 296 pp.**

**Antina von Schnitzler, *Democracy's Infrastructure: Techno-politics and Protest after Apartheid*. Princeton, NJ, and Oxford: Princeton University Press, 2016. 238 pp.**

**INTRODUCTION**

*Ko s'ohun to'le se k'o ma lo'mi o*  
*Nothing without water*  
Fela Kuti

Of water's numerous functions, its social and political roles are perhaps the most intriguing and complex. Its intrinsic properties give it a singular capacity to foster cooperation and organization. Yet, its multiple uses and values make organization a complex and conflictive process. Nation states have overcome some of these organizational challenges. However, the task of establishing regimes that accommodate competing values of water and promote the sustainable use and equitable distribution of the substance has proved too great for most post-colonial states. Moreover, state expansion has created new tensions as modern water systems have displaced local forms of organization and knowledge, created new inequalities and transformed socio-ecological relations.

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The two anthropology books under review in this essay provide valuable insights into these tensions. *Hydraulic City* offers a rich and intimate account of the public water system in Mumbai and the sustained efforts of poor families and communities to secure and maintain access to water. *Democracy's Infrastructure* provides a detailed analysis of the introduction of water meters in poor neighbourhoods in South Africa and the vociferous resistance residents waged against the initiative. Water is more central to the first book than the second but other important themes connect them, especially infrastructure and citizenship. Post-colonial cities, neighbourhoods and slums provide the backdrop for the analysis. The central actors are poor residents and communities who navigate a complex terrain between the 'formal' and 'informal' and the 'civic' and 'uncivic'. Ethnographic methods are employed to explore their interactions with water, engineers, bureaucrats, politicians and infrastructure. However, the authors vary in their use of ethnography. Nikhil Anand skilfully blends the views of the subjects of his research with his own observations in *Hydraulic City*. He also offers useful insights into ethnography, including points related to fieldwork and positionality. Meanwhile, Antina von Schnitzler devotes less time to explaining and pondering her ethnographic fieldwork and gives less space to the voices of the actors at the centre of her research. The result is that the reader is closer to the subjects of *Hydraulic City* than *Democracy's Infrastructure* and is offered a more intimate account of their thoughts and experiences.

Both authors complement their ethnographic data with other source materials. *Hydraulic City* incorporates extracts of local newspaper articles, which enables Anand to explain the way the public water system has been depicted in the media in Mumbai and to explore the discursive dimensions of water. He also draws on official documents to show how formal calculations of water supply and demand frame debates around scarcity in the city. *Democracy's Infrastructure* includes documents from a landmark legal case lodged against the installation of water meters in South Africa, which allows von Schnitzler to shed further light on the struggle against the introduction of the new technology. These materials also provide valuable insight into the economic conditions and strategies of the urban poor, something lacking in her ethnographic research. Von Schnitzler also incorporates assorted texts on political theory and economic policy, which she uses to explore how neoliberal thought travelled to South Africa and shaped the political landscape, both during and after apartheid.<sup>1</sup>

One central message to emerge from the two books is that modern water regimes do not evolve along fixed or determined paths. While continuity is apparent, rupture and resistance are ubiquitous, shunting water regimes in unexpected directions. The books therefore caution against linear

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1. Von Schnitzler convincingly argues that countries in the global South should be seen 'not merely as recipients of neoliberal policies, but as epistemic locations in which neoliberal thought is adapted, reformulated and produced' (p. 34).

interpretations of water modernization which see a growing number of citizens seamlessly incorporated into water systems as infrastructure and development advance. Hence, water regimes are important sites of social and political struggle and offer a window into broader processes of social and political change.

Taking this as a point of departure, I will seek to show in the remainder of this essay how modern water regimes have generated forms of contention and resistance that have presented important challenges to neoliberal political projects. However, I will also argue that contemporary water struggles are more deeply rooted in market capitalism and are therefore part of longer-term historical processes. The essay is structured as follows. It starts by discussing anthropological approaches to infrastructure politics and highlighting some of the debates around this relatively new field of research. It then explores how poor families and communities have struggled to secure and maintain access to water and contested neoliberal citizenship. The subsequent section considers the social construction of water scarcity, showing the extent to which it is embedded in market capitalism and highlighting the impact it has on the urban and rural poor. The essay then turns to the problems of measuring and quantifying water and points towards the limits of the human control of this substance. It concludes by reflecting on some of the strengths and weaknesses of the two books and on anthropological approaches to infrastructure politics.

## **INFRASTRUCTURE POLITICS**

Over the last decade infrastructure politics has received greater theoretical and empirical attention among anthropologists.<sup>2</sup> Summarizing this trend, Penny Harvey highlights the multiple dimensions of infrastructure, including the ‘constitutive relations’, for example, finance, materials and design, the ‘contingent events’ that disrupt and reconfigure, and the ‘emergent effects’ that transform the social and natural world (Harvey in Ventakesan et al., 2018: 4–5). Meanwhile, Laura Rival, who is more critical of the recent turn to infrastructure politics in anthropological research, stresses the need to interrogate the logic of infrastructure and ask what kind of progress it offers and whose interests it serves (Rival in Ventakesan et al., 2018: 13). She notes that economic criteria are typically used to gauge the viability of infrastructure projects while other important dimensions are marginalized or ignored. Her insights suggest critical attention should be paid to the competing value regimes that are embedded in infrastructure and the political tensions that emerge around them. While this is generally true, it is particularly important in relation to water because of its multiple uses and values. Anand makes

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2. For insight into anthropological approaches to infrastructure, see Harvey et al. (2017), Hetherington and Campbell (2014) and the contributions in Venkatesan et al. (2018).

this point emphatically in *Hydraulic City*. For example, describing a pilgrimage to taste and experience the magical waters of the Mithi River, he notes: 'Together, on the banks of where the river-creek-sewer meets the sea, the scientists, police, and publics experienced a liquid material that was simultaneously sewage, sea, a miracle, a health risk, a health cure, a business opportunity, evening entertainment, and a law and order problem' (p. 220). Hydraulic infrastructure has the capacity to accommodate some of these uses, values and meanings. However, modern water systems are generally based on the logic of 'full-cost recovery' and the 'efficient' and 'rational' use of water which privileges economic and utilitarian factors.

Indeed, as von Schnitzler details in *Democracy's Infrastructure*, hydraulic infrastructure can perform a crucial role in promoting economic rationality, highlighting the importance of exploring the underlying logic and purpose of infrastructure. She sees the introduction of water meters in South Africa at the turn of the 21<sup>st</sup> century as part of a longer-term process of state-sponsored economic rationalization. The meters — which require poor urban households to purchase water after a minimal amount has been freely dispensed — act as a type of economic disciplining device, encouraging residents to generate income on the one hand, and economize their use of water on the other. However, von Schnitzler also shows that the logic of modern water infrastructure can be challenged and subverted. In Soweto, residents have found creative ways to bypass the meters and secure access to water. She describes a game of cat-and-mouse as residents seek to evade the meters and bureaucrats and engineers attempt to enforce them. Every effort to strengthen the meters has been met with resistance in a 'seemingly endless cycle of innovation and subversion' (p. 131).

Here, attention is drawn to the active role citizens have performed in shaping modern water infrastructure. However, this point is not fully explored in either book, which is problematic because the way infrastructure is constructed and maintained has important political implications. James Holston (2008) hints at this in his landmark analysis of citizenship in Brazil, showing how the historical 'autoconstruction' of the peripheries of Brazilian cities provided the foundation for the emergence of 'insurgent' forms of citizenship which reconfigured the political landscape at the turn of the century. Hence, the 'city is not merely the context of citizenship struggles. Its wraps of asphalt, concrete, and stucco, its infrastructure of electricity and plumbing also provide the substance' (Holston, 2008: 9). The political salience of the construction of infrastructure is also evident in processes of 'coproduction' in which state and social actors come together to deliver public goods and services. In Ecuador, for example, highland rural communities have performed a prominent role in the construction and maintenance of hydraulic infrastructure, through both financial contributions and collective labour power (Goodwin, 2018). Ongoing efforts to establish a new water regime in the Andean country have involved intense political struggle partly because of this historical process. Communities have opposed greater state

control and regulation as they have made vital contributions to the construction and maintenance of water infrastructure. Thus, the constitutive relations related to the construction and maintenance of infrastructure have important political implications, including issues related to resistance, authority and autonomy.

Despite the lack of attention given to these issues, the two books under review demonstrate the value of exploring politics through infrastructure, revealing the important, and often concealed, role it performs in advancing and embedding political projects and showing how it can become a site of resistance and struggle in capitalist societies. However, it is crucial that anthropological analysis is not reduced to this domain. The risk is that too much explanatory power is given to infrastructure and other important political issues are marginalized or overlooked. Sian Lazar stresses this point, arguing that anthropological infrastructure research tends to focus on governance, ‘with the risk that infrastructural approaches might even de-politicise what are actually highly political questions’ (Lazar in Venkatesan et al., 2018: 29). Of the two books under review, *Democracy’s Infrastructure* is most guilty of falling into this trap. Yet, as the next section shows, it still provides valuable insights into other pressing political issues.

### CONTESTED CITIZENSHIPS

Infrastructure is one domain through which state–society relations are mediated and these two books provide important insights into this issue. Citizenship is the main concept employed by the authors to explore these relations, with both building on recent anthropological research that shows rights are typically highly unequally distributed across society, challenging universal notions of citizenship.<sup>3</sup>

Anand investigates these relations through the lens of ‘hydraulic citizenship’. He argues that this is not linear but a ‘cyclical, iterative process that is highly dependent on social histories, political technologies, *and* the material-semiotic infrastructures of water distribution in the city’ (pp. 8–9, emphasis in the original). By exploring their daily experiences and interactions with the public water system, he documents how poor residents in Mumbai struggle to attain and retain hydraulic citizenship. Rights are won and lost as social and political relations shift and water ebbs and flows through the city. Hence, poor and marginalized citizens are engaged in a constant struggle to claim and defend their rights.

Von Schnitzler also explores the everyday experience of citizenship; however, she makes greater effort to connect these experiences to broader

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3. On this, see, for example, Holston (2008) and Lazar (2013).

processes of political change. Leaning on Michel Foucault, she emphasizes citizen formation, seeing this as a central part of the neoliberal project that emerged under apartheid and continues to underpin politics in post-apartheid South Africa. Her point of departure is that citizenship is based on important assumptions about 'the kinds of behaviours, dispositions, habits and virtues that define relationships to the state' and that these attributes are not innate but require cultivation (p. 19). Neoliberal capitalism entailed stripping back and hollowing out citizenship and demanded a new type of political subject. She argues that a central feature of this process was redirecting political struggles to the technical and administrative domains. Thus, state–society relations are mediated through technical-administrative devices which become 'central political terrain' (p. 4). She argues that water meters are emblematic of this change and reflect a broader political shift: 'Payment for services is here no longer a moral act affectively binding citizens into a mutual relation with a larger collective vision; instead paying for water or electricity is an individual transaction premised upon an immediate exchange and ultimately enforced by a technical instrument' (p. 102).

This passage suggests that the water system in Johannesburg is becoming increasingly based on formal rules and impersonal relations. However, as hinted above, a web of informal practices and relationships underpins the system and provides poor households and communities with access to water. While *Democracy's Infrastructure* pays little attention to the relationship between the formal and informal, *Hydraulic City* sheds light on how it influences the rights and citizenship of the urban poor. To access water through the public water system, poor households and communities must draw on a range of informal practices and networks. Here, plumbers perform a key mediating role, combining formal and informal rules and practices with intimate knowledge of infrastructure and hydrology to provide poor households with water (pp. 204–12). Yet, inclusion comes at a cost: one Mumbai resident paid US\$ 2,000 for the connection and pipes to bring water to his house. Thus, insertion into the formal system often requires mobilizing significant economic resources, indicating the extent to which rights are unequally distributed across the city.

Patronage also performs an important role in providing and blocking access to water for the urban poor. While formal rules state that residents of settlements that have been formally recognized should be able to access water without resorting to personal political connections, the system in Mumbai operates according to a different logic: 'It requires procedures that depend on personal networks of legitimation and endorsement in order to work. Therefore, even once residents achieve state recognition after years of delicate political and social manoeuvring, their illiberal relations with councillors or political parties continues to play a significant role. Patronage politics run right through the state's water system' (p. 92).

Yet, while much of water politics in Mumbai is seemingly informal and unwritten, formal documentation still performs a crucial role. Anand argues

that informal settlers constantly demand recognition through water bills, while public officials actively seek to avoid issuing official water documents in the fear of encouraging new political claims. Thus, offering a twist in the classic governmentality tale, Anand claims that ‘the state works hard *not to count* and works hard *not to know* certain populations as liberal citizens’ (p. 89, emphasis in the original). Hence, rather than the state seeking to defend and extend the rights of its citizens, it actively seeks to limit them and maintain a highly segmented form of citizenship which actively discriminates against poor informal communities.

Despite the recalcitrance of the Indian state, poor residents in Mumbai have attempted to reassert and strengthen their rights through collective organization and mobilization. While Anand downplays the role of ‘contentious’ forms of political action, his analysis suggests that this performs a significant role in water politics in the city. The clearest illustration of this provided in *Hydraulic City* are the efforts of non-governmental and community-based organizations to resist the piecemeal privatization of the public water system in the 2000s (pp. 140–57). The scheme, which was actively supported by the World Bank, was framed as a neutral initiative to upgrade and modernize the system. However, local leaders saw beyond this discourse and mobilized to derail the programme, including staging street performances, disrupting public meetings, holding protests and informing residents of the reform plans. This collective resistance, which Anand somewhat dismissively describes as a ‘moderately effective opposition’, centred on the claim that ‘water was a human right and not a commodity’ (p. 19).<sup>4</sup> Thus, rights discourses were mobilized to challenge privatization and defend and improve access to water.

Opposition to the installation of water meters in poor neighbourhoods in South Africa was based on similar grounds, according to *Democracy’s Infrastructure*. Resistance took a variety of forms, including common and creative ‘repertoires of contention’.<sup>5</sup> The former included protesting and pamphleteering. The latter involved a combination of working with and against the meters; circumventing and destroying them on one hand and using them to measure and quantify water on the other (pp. 132–67). Here, von Schnitzler argues that grassroots organizations and social movements subverted the water meters by recording disconnections, detailing water consumption and demonstrating the potential for cross-subsidization. In doing so, she argues that these ‘insurgent numbers’ instilled measurement with ‘new affective value’ (p. 164). Among other things, the movement against the meters shows how state efforts to make the social and natural world legible can be turned on their head through creative and collective social organization and mobilization (Scott, 1998).

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4. See Bakker (2007, 2010) for critical reflections on debates over ‘water as a commodity’ versus ‘water as a right’.

5. On repertoires of contention, see Tarrow and Tilly (2015).

Von Schnitzler shows that residents also used more conventional channels to oppose the initiative. In 2007, a group of residents launched a landmark legal case against the City of Johannesburg on the grounds that the meters violated their ‘right to water’, which is enshrined in the South African constitution (pp. 168–95). Her illuminating analysis of the case, which draws on several personal testimonies, shines light on efforts to enforce constitutional rights to water and points toward the limits of the judicialization of politics. The residents won the case in the local courts only to see the verdict overturned by the Constitutional Court, following intense pressure from the Mayor of Johannesburg who argued courts should not interfere with governance issues. While the case was overruled, it prompted the local authorities to increase the minimum amount of water distributed to poorest households. Thus, concessions were won through legal activism; however, the meters remained in place and the universal right to water was unfulfilled.

### CONSTRUCTING SCARCITY

Important insights into state–society relations therefore emerge through the analysis presented in the two books. However, with the analytical lens fixed firmly on citizenship, less attention is paid to relations between social classes and how the social and economic structure influences the politics and distribution of water.

While this is true of both books, *Hydraulic City* provides greater insight into this issue. Eschewing dualist accounts that divide Mumbai into the ‘haves’ and ‘have-nots’, Anand aims to offer a more fluid interpretation of social and political life in the city (pp. 65–67). While he is broadly successful in this effort, his analysis still points towards enduring structural inequalities between social classes. The author is not blind to this. Indeed, he carefully explains how official data capture and obscure water inequalities and he provides some indication of how these inequalities are constructed and reproduced. However, the political implications of the skewed distribution of water in the city are not fully explored. The analysis presented in *Hydraulic City* suggests that the public water system acts as a type of ‘opportunity hoarding’ or ‘social closure’ mechanism: the concentration of water among classes with more social power restricts access to classes with less.<sup>6</sup> Hence, classes are relationally connected through water and the social structure has a significant bearing on water distribution. Viewed from this perspective, providing water to the millions of poor households that lack sufficient access becomes more problematic because it implies diverting water away from

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6. On opportunity hoarding and social closure, see Wright (2015).

social classes with more power, which is precisely the opposite direction to the way it generally flows in capitalist societies.<sup>7</sup>

This highlights the simple fact that water is scarce for some but not for others. While blindingly obvious, the issue is masked by mainstream water narratives that frame scarcity as naturally endowed.<sup>8</sup> From this perspective, water supply places clear constraints on human consumption and water should be managed within these natural limits. Once water is treated as a scarce resource, emphasis shifts to efficient use. The discourse therefore fits neatly into neoclassical economic theory which is fundamentally concerned with the efficient allocation of scarce resources that have alternative uses. Water management is reduced to the challenge of maximizing utility and profit within natural constraints. The market is considered the best vehicle to achieve these objectives, with prices conveying information about the value of water and regulating its use and distribution. Hence, framing water as a scarce resource provides a theoretical basis for the commodification of water.

The role markets perform in creating scarcity is absent from this narrative. Karl Polanyi (1957) drew attention to this crucial point decades ago when he distinguished between ‘formal’ and ‘substantive’ meanings of the term ‘economic’.<sup>9</sup> The former, which dominates modern economic thinking, refers to choices over the alternative use of scarce resources within markets. The latter relates to the satisfaction of material needs through continuous interactions between the social and natural world.<sup>10</sup> From the substantive perspective, the market is only one way of organizing economic life and the economy is not reduced to the dilemma of choice under scarcity. By contrasting the formal and substantive readings of the economy, Polanyi points towards the artificiality of scarcity in market capitalist societies. The connection between this feature of market capitalism and mainstream water

7. Technically, increasing the total amount of water available within the public water system could reduce or eliminate the need for redistribution. Three main routes appear open: 1) invest massively in the water system to improve water capture, reduce leakages and enhance distribution; 2) significantly reduce consumption to increase the amount of total water available; and 3) find new water sources. However, even if these steps were taken, power relations within the city suggest the additional water would flow toward the wealthiest sectors of the city. Moreover, channelling more water to the city from new freshwater sources would almost certainly deepen rural–urban inequalities.

8. On water scarcity, see Bakker (2010); Otero et al. (2011); Swyngedouw (2007, 2013); Woodhouse and Muller (2017). See also Scoones et al. (2018).

9. Polanyi’s formal/substantive classification triggered a heated debate among anthropologists, sociologists and economists. See, for example, Hann and Hart (2009); Humphreys (1969); North (1977).

10. Polanyi (1957: 243–44) argues that ‘if choice there be, it need not be induced by the limiting effect of a “scarcity” of the means; indeed, some of the most important physical and social conditions of livelihood such as the availability of air and water . . . are not, as a rule, so limiting’.

scarcity narratives has been noted by some critical scholars. For example, Eric Swyngedouw observes:

A market economy, of course, requires ‘scarcity’ to function. If need be, therefore, ‘scarcity’ will be effectively ‘produced’, i.e. socially engineered. Moreover, this manufactured scarcity is invariably presented as residing in nature, even to the point of ‘blaming’ nature for the social conflicts that arise over water. In fact, water is one of the least finite resources in the world. It is plentiful and virtually non-exhaustible. (Swyngedouw, 2007: 202)

Viewing water scarcity as socially constructed rather than naturally endowed, shifts analytical attention to the human causes of scarcity and the factors that influence water distribution.<sup>11</sup> The two books under review shine a light on these issues. They suggest that even if water scarcity is rooted in market capitalism, the issue cannot be reduced to the market. Both volumes demonstrate that urban public water systems produce scarcity for poor and marginalized households.<sup>12</sup> Moreover, *Hydraulic City* shows that the state has performed a lead role in creating rural water scarcity by redirecting hydraulic flows to Mumbai to quench its insatiable thirst (pp. 29–59). Farmers have been deprived of irrigation and have seen their livelihoods imperilled or destroyed. Migration to the city has accelerated as the lack of water has undermined the viability of small-scale agriculture. Here, the limits of hydraulic citizenship come sharply into focus as the expansion of water rights in the city has been at the expense of the erosion of water rights in the countryside. Widening the analytical lens to include rural areas, one of the many merits of this book, adds another layer of complexity to distributional struggles and indicates the role nation states have performed in creating and embedding spatial water inequalities.

*Hydraulic City* also shows that water inequalities are not immutable. Through a comparative analysis of two informal settlements in northern Mumbai, it shows how one settlement gradually lost connection to the public water system and increasingly turned to wells to obtain water, while another strengthened links to the main system and improved water supply (pp. 193–217). Various factors explain the divergent paths the two settlements followed, including economic opportunities, religious discrimination,

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11. Notably, standard measures of water scarcity obscure distributional issues by taking the population as the main unit of analysis. The most commonly used metric — the ‘water stress index’ — calculates the amount of water required to sustain human groups in relation to the amount of water available. The standard threshold for water stress is 1,700 m<sup>3</sup> of freshwater per capita/annum. Below that limit countries or regions are considered to be ‘water stressed’ and below 1,000 m<sup>3</sup> countries or regions are classified as ‘water scarce’. In a recent review of water scarcity metrics, Damkjaer and Taylor (2017: 514) argue that these thresholds ‘have been uncritically adopted and assimilated in the mainstream literature without an empirical base’.

12. The water system in Johannesburg actually sits somewhere between public and private, having been ‘corporatized’ during neoliberal reform. Put simply, this involved the state converting the public utility into a private firm but retaining all the shares. For a fuller explanation, see *Democracy’s Infrastructure* (pp. 140–45). See also Bakker (2010).

patronage politics and social organization. The analysis highlights a crucial point about water struggles and scarcity: poor and marginalized communities often have to remain organized to retain access to water and prevent inequality and scarcity emerging or deepening. *Democracy's Infrastructure* also demonstrates this point, with collective organization required to ensure continued access to water after the installation of meters. Thus, merely mobilizing to access water is insufficient: communities must remain vigilant to ensure water supplies are not eroded or removed over time.

Several other interesting dimensions of socially constructed water scarcity are highlighted in *Hydraulic City*. The first relates to the temporal dimension of scarcity and inequality. The book points towards two broad patterns in the city (pp. 97–99). One, which appears in formal neighbourhoods populated by the middle and upper classes, involves residents who have introduced a range of supplementary devices, including switches, sumps, pumps and tanks, to smooth flows of water into their households. The combination of strong connections to the water system and private modifications to water infrastructure have enabled residents in this group to secure steady access to water and transcend the water schedule that regulates the temporal distribution of water in the city. The other, which is concentrated in largely poor informal settlements, involves residents with less reliable and often shared water connections. Households in this group do not have the economic resources or legal authority to improve water supply through augmenting the public system and therefore must adhere to the schedule. Hence, water scarcity has temporal as well as quantitative dimensions.<sup>13</sup>

The second dimension relates to the discursive construction of scarcity. Anand shows how the private and public spheres interact to produce narratives of water shortages (pp. 29–59). The public water department inflates the water demands of the city to exaggerate water shortages and this figure is then used as a baseline for media coverage and official reports. Thus, scarcity narratives are deeply embedded within the private media and water bureaucracy.

The third aspect concerns the everyday experiences of scarcity. The book shows that water is a source of both unity and division, bringing communities together on the one hand and driving them apart on the other. Here, the tensions and strains created by water scarcity come sharply into focus as residents of informal settlements scramble to secure sufficient water during 'water time' (pp. 97–130).<sup>14</sup> 'There are two times of the day. There are the four hours of water supply, when all of us, very good friends even, are each other's enemies. And then there are the other twenty hours, when we are the best of friends, when we would do anything to help each other' (p. 108). This

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13. This echoes ethnographic research that explores the temporal dimension of relations between the poor and the state. See, for example, Auyero (2012).

14. See Geertz (1972) for earlier anthropological reflections on social tension induced by water scarcity.

testimony captures the social strain caused by water scarcity. Anand shows that this strain is not distributed equally, with the responsibility of securing sufficient water while maintaining good relations with neighbours falling largely on women (p. 99).<sup>15</sup> Hence, water scarcity is a gendered process and struggles for gender equality must consider this vital dimension.

### APPROXIMATING WATER

While efforts to render water legible have gone hand-in-hand with the development of modern hydraulic systems, the trend has accelerated during the neoliberal stage of capitalism as attempts to incorporate water into processes of commodification and accumulation have intensified.

To support these processes, neoliberal reforms and governments have sought to create a new 'water culture' which frames water as a scarce resource and requires 'consumers' to pay to access it.<sup>16</sup> These reforms, as von Schnitzler persuasively argues in *Democracy's Infrastructure*, are part of a wider effort to form rational economic actors who respond to price signals and numerical incentives (pp. 132–67). She details the efforts of the corporate water utility in Johannesburg to promote rational water use through numbers. A pamphlet distributed to explain how to use the free allocation of water introduced after the installation of meters gives a sense of the role of quantification in promoting the reforms: '20 litres of water for cleaning, 6 body washes per day, 6 flushes of the toilet per day, 2 kettles of water per day, 1 sinkful of dishes per day, 1 clothes wash every second day, 12 litres of drinking water per day = 6000 litres of water usage for the month' (pp. 148–49). The document therefore encouraged residents to measure water and allocate it efficiently across household tasks. Meters facilitated this new quantitative relationship with water by allowing residents to check their usage and calculate the cost of their consumption. Thus, the meters promoted a new way of valuing water. Changes in the valuation and distribution of water at the household level were accompanied by revisions to the legal and bureaucratic framework which supported the techno-political control of water at the local and national level. Water was treated as a technical problem and decision making related to the substance increasingly took place within insulated technical committees.

Underlying these policies and perspectives is the basic assumption that humans have the capacity to master and control water. Yet, water perpetually evades capture, suggesting there are definite limits to state or market control of the substance. *Hydraulic City* points towards this by positing 'water as approximation' (pp. 161–89). Building on the astute insights of a local

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15. On the gendered dimensions of water, see Bennet (2005) and Mehta (2014).

16. See Paerregaard et al. (2016) for critical reflections on attempts to create a new water culture along these lines in Peru.

water engineer, Anand argues that it is ‘critical to see water’s variously generated numbers as representing not verifiable quantities but approximations’ (p. 161). Explaining the porousness of the public water system in Mumbai and detailing the perennial attempts of public officials and water engineers to prevent and repair leakages, he argues that the ‘qualities and quantities of leakage slide quickly and perniciously between various types of ignorance . . . and become very difficult to map, count, know, and contain through the audit technologies of state officials’ (p. 162). While some of the holes in the system could no doubt be plugged by upgrading infrastructure and introducing new technology, *Hydraulic City* leaves little doubt there are clear limits to this. Water’s rebelliousness, its refusal to follow human scripts, is another reason why water systems travel unexpected paths and arrive at unplanned destinations. Hence, the ‘contingent events’ that derail and reconfigure hydraulic infrastructure come in non-human as well as human forms (Harvey in Ventakesan et al., 2018).

## CONCLUSION

The two books reviewed in this essay draw attention to the strains and tensions that modern water regimes have generated and the complex terrain that the urban poor navigate to secure and maintain access to water. Drawing principally on ethnographic research, the authors show how citizenship is mediated through infrastructure and how infrastructure is an important site of resistance and struggle in contemporary capitalist societies. Objects that might be considered neutral and mundane — pipes, switches, meters — are revealed as highly political and key components of national political projects.

The analytical attention the two books give to infrastructure is therefore welcome. Yet, the importance of infrastructure should not be overstated. One risk is that anthropological research becomes excessively narrow and crucial political issues are ignored.<sup>17</sup> Another is that other factors that influence contention and resistance are overlooked. For example, economic factors are given scant attention in both books. This is particularly problematic in *Democracy’s Infrastructure* which collapses popular protest to struggles over infrastructure, governance and citizenship. It is only in the penultimate chapter that the reader gains real insight into the economic conditions of the urban poor. The negligible attention economic factors receive is especially troublesome given the eye-watering levels of income inequality in South Africa. Surely the obscene distribution of income and lack of economic

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17. Sian Lazar claims that this has already happened, arguing that ‘infrastructure has become a monster that devours all the political, all the anthropological approaches to the political’ (Lazar in Ventakesan et al., 2018: 29).

opportunities in the country have a considerable bearing on protest and citizenship?

Despite the lack of attention given to economic factors, these books provide considerable insight into citizenship, contention and resistance in post-colonial cities. The authors also cast new light on urban water struggles and politics. The capacity of modern water regimes to unite and divide and include and exclude is demonstrated and the need to explore the various dimensions of the social construction of water scarcity is stressed. The books reveal some of the obstacles that the urban poor face in confronting scarcity. Yet, by documenting the creative strategies and practices poor households and communities have employed to secure and maintain access to water, they also provide clues as to how it can be overcome.

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