

Tapping In:

Leaky Sovereignties and Engineered (Dis)Order in an Urban Water System¹

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A municipal water service is, like any other service, a relation among actors, a social exchange. Large engineering bureaucracies, however, tend to conceive of and portray their services as structured primarily by natural principles such as gravity, slope and depth, or by the imperatives of science and engineering. Pressure, scale, size and distance are presented as natural 'givens' – universal imperatives, free of history – and are invoked to explain the limits and parameters within which the service must operate. But, as the French social theorist of science Bruno Latour points out, the world of objects must be analytically desegregated from the world of people to apprehend the mutually interacting 'social' in both domains.² Rarely does this call ring more compellingly than in the landscapes of an engineered urban resource grid like an electricity network, a municipal water system or a road layout. Long processes of inscription on the landscape, of social relations of power, rule, resistance and compromise, come to us in the form of literally concrete realities – reservoirs, mains, distribution stations – that are putatively impersonal and fixed.

Anthropomorphic Grids

Engineering organisations such as Metrowater (Chennai's state-run water utility) insistently deny the operation of any social classificatory schemes in their provision of service. A common strategy by which engineering models are naturalised is to make people invisible, or to invoke them only as abstractions such as "the city", "areas served" or "population". As the French philosopher and cultural theorist Michel de Certeau contends in his essay "Walking the City" (2000), the totalising view of planners, or the theoretical concept of the city, is produced by being lifted high off the ground, out of the city's grasp, leaving behind

the mass of wandering lifeways that inhabit its spaces. But what de Certeau and the American political scientist James Scott (1988) portray as the distanced view from above – the God's-eye view, the eye of the sovereign that renders itself into the high-modernist logic of the grid – is in this case situated below the ground. In Chennai's municipal water utility, the underground network of pipes – monopolistic, integrated and state-controlled – is the principal actor, the embodiment of state sovereignty that claims to fulfil the water needs of each and all of the city's inhabitants.

Firmly grounded in this impersonal yet powerful agent of flows, the water bureaucracy can then rise above or deny human discretion and maintain the claim that all distribution is



effected through the working of "the system". In Chennai's underground water system, however, decisions about allocation and distribution lurk everywhere. Line pressure is the principal parameter through which distribution is conceived and discussed. The circumference of pipes, the location of valves, the depth at which interconnections are laid, the location of overhead tanks, the installation of boosters or other pumps – these are all technological options through which pressures can be (and are) calibrated in the system, and distribution/discrimination effected. Some of these parameters are more readily manipulated than others. Yet these operations are rarely talked about. Instead, line pressure is portrayed as a function of more impersonal factors, such as the amount of water available and the structure of the pipe network.

Metrowater's depot engineers, in interviews with me, shied away from any suggestion that they actively allocated water to categories of populations. "Equitable distribution" was the stated policy of the organisation, but the onus for achieving this goal was placed on the hardware, specifically on the new zoning system in the water grid, which was designed to improve pressure to all parts of the system.

Thus, the normative model and the official account is of a rational extension of the zonal

distribution system, based on city growth, population figures and categories of land use. Some ethnographic digging, however, revealed that the abstract, schematic order of the underground water grid, informed by engineering and statistical logic, had little to do with the lived and disorderly landscapes of local water use. The impersonal paradigm of pressure was subjected to daily manipulation in the localised settings of the depot. Through collusions between frontline engineers and the public, and in the easy unofficial modes so typical of official practice, bypass connections were effected, valves were manipulated, furtive handpumps were installed, pipes were raised or lowered. As one engineer explained to me:

Valves are set by agreement among two or three depot engineers and the Area Engineer. Sometimes there are conflicts, but we reach an agreement. There are practical difficulties – the pipes have not been laid properly, the design is faulty. We should put one more pump on that line but we don't know if the pipes will stand the pressure! There are all these problems, but we cannot explain this to the public – they will not understand.

Beneath the architecture of rules and policies, the landscape of the water service is full of bypass connections, underground compromises adopted in response to scarce funds and urgent demands. As one engineer said:

The system is not right. We are always firefighting – one VIP complains, and a bypass connection is given. To operate a valve, we are supposed to get permission from higher authorities, but who does! I myself am now thinking: to solve the Radhakrishnan Nagar complaint, which bypass can I operate? There are so many interconnections and bypasses. We make temporary accommodations and they become permanent!



Thus, while the sovereignty of the grid is premised on its integrity, rationality and equitability, people intimately engaged with its maintenance know it as patchy, layered, segmented. It has to contend with the active exercise of another sovereignty – that of the citizens in their need for water. The system is riddled with illegal connections. One engineer said, "As long as there is a depot there will be illegal connections – everybody knows about them". Another told me that in her depot the local councillor (politician) used depot workers so frequently to install illegal connections that she (the engineer) had, in response, developed the habit of taking different routes from her residence to the depot every morning and afternoon, so that she could catch the workers in the act: "I would find them digging a pit and they would tell me they were working on a complaint – what complaint could they be attending to at 6 pm? Entire *nagars* (townships) had illegal connections, and the councillor would have broken my arms and legs if I'd tried to cut them".

In the summer of 2002, I spent countless hours standing beside depot engineers under the blazing Chennai sun as they supervised excavations on the city streets, where Metrowater workers in their blue uniforms cut through tarmac or concrete and dug through a couple of feet of solid urban soil to uncover water pipes and joints. While these laborious manual excavations were sometimes carried out to fix leaks, clear blocks, or detect sources of pollution, they were just as often acts of policing. I was struck by the vast amounts of time and energy that the engineers spent tracking the buried histories of illegal connections, doggedly waiting as one part of the line was uncovered, then not satisfied, directing the workers to start at another point or to trench in another direction. Why all this trouble, since they all knew that the system was riddled with anomalies; in de Certeau's words, "everywhere punched and torn open by ellipses, drifts and leaks of meaning:^{3a} sieve-order" (2000:160).

Late one afternoon, the Corporation Engineer's assistant Arumugam comes into the depot I am visiting, to inform the Metrowater depot engineer that there is an illegal connection being installed in a newly constructed house in her division. The depot engineer sets off immediately to check on this. She comes back and reports that she ordered the connection cut. However, she can think or talk of nothing else for the remainder of the day. I pretend not to be listening too closely as she questions the depot manager, trying to track the antecedents of the story. She says she has heard that the previous depot engineer had collected a huge sum of money from the house owner. Part of the problem seems to be that the client has strong connections with the local councillor. After much dithering, she finally calls the councillor on the phone and tells him about her decision to cut the connection.

When I come in the next day, she is still worrying about this. She goes to the site again, this time taking me along. The workers have been asked to assemble there and have already excavated the pipes. The story seems to be that when the owner got a legal connection about six months earlier, the head water-worker Rajendran had

given him an extra open line at the entrance to the property. The owner argues, in alternately conciliatory, defensive and aggressive modes, that as the entire sector of the street is his property, he is entitled to subdivide the water connection as needed. He also claims that Rajendran had told him he could take these T-connections. Rajendran meanwhile feigns complete ignorance of all this, instead offering different histories of the pipes every few minutes - when they were laid, where they led, what connections were taken, who authorised them, who built them, etc.

We finally leave after the engineer orders the owner to come to the office with his papers the next day; the workers remove the pipes. But the engineer remains worried and nonplussed about what to do. She tells me illegal connections are not common in this depot ; MW labourers do a few, but doing them without the depot engineer's knowledge is almost unheard of. I suggest to her that she consult the Area Engineer, but she says she cannot: "These are my workers doing all this! I would be implicating not only them but the previous depot engineer! As for the councillor, he will want money from the house-owner, but he will want me to ask for it!"

What was interesting to me in this incident was the intense dilemma the engineer was thrown into by the seemingly straightforward problem of an illegal connection. She had to negotiate a labyrinth of plots constituted by rumours, illicit acts and transgressive collaborations in order to enact or exert her own agendas of personal survival, responsibility to her workers and colleagues, and a wider official accountability. She was also caught in the classic bureaucratic conundrum where, as head of the unit, she was also the newest kid on the block with at best a shallow grasp of local geographies and histories of power and collaboration. All these needed to be unravelled in order to act effectively, or at least safely.

Thus, the so-called 'givens' of the system are altered not just through the linear model of continuous rational improvement, but through unruly assertions of rights and through struggles and compromises. The ideology of an impersonal underground network of concrete or iron fixes in place the set of underground arrangements through which lower-level bureaucrats and people together fashion the ideas of state, rule and service that they can live with. The model incorporates significant silences. Illegal or bypass connections are eventually "regularised" – as much through a lack of documentation as through actual acts of regularisation. Not writing down, I found, is as much a part of bureaucratic practice as is writing.

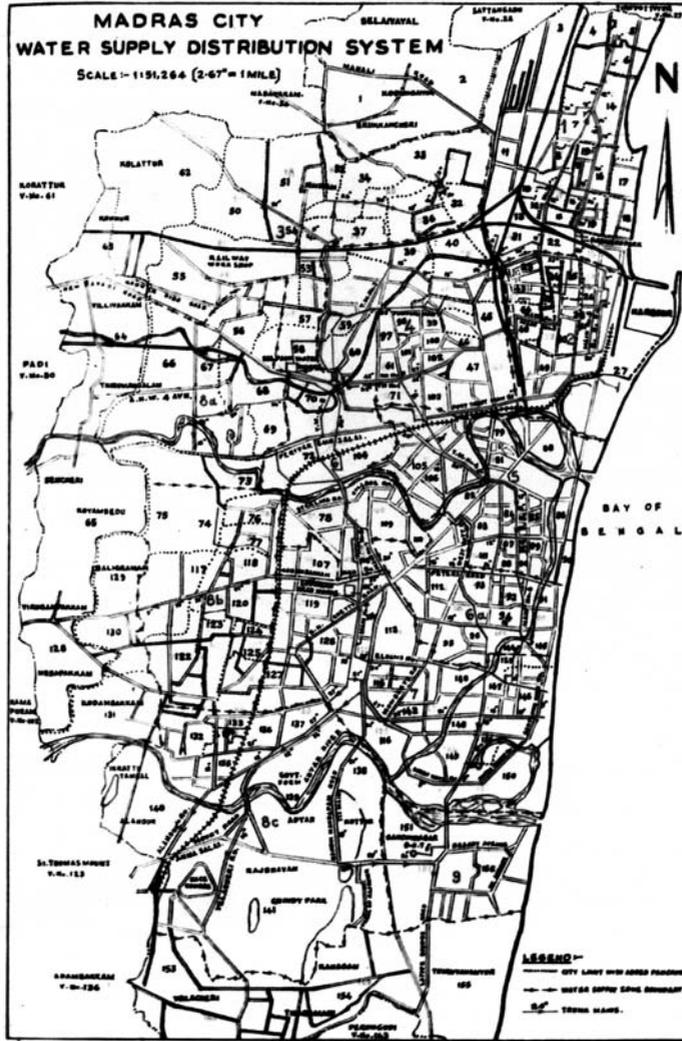
Maps of the distribution system, then, are partial accounts, idealised representations that ignore some illegal additions and incorporate others as if they were part of the original plan. Their truth is at variance with that of the social arrangements through which people tap into the system. They constitute a classic myth of state. However they also function performatively, as authoritative graphics: what is not on the map is, by definition, illegal.

Pipes, Peripheries, Politics

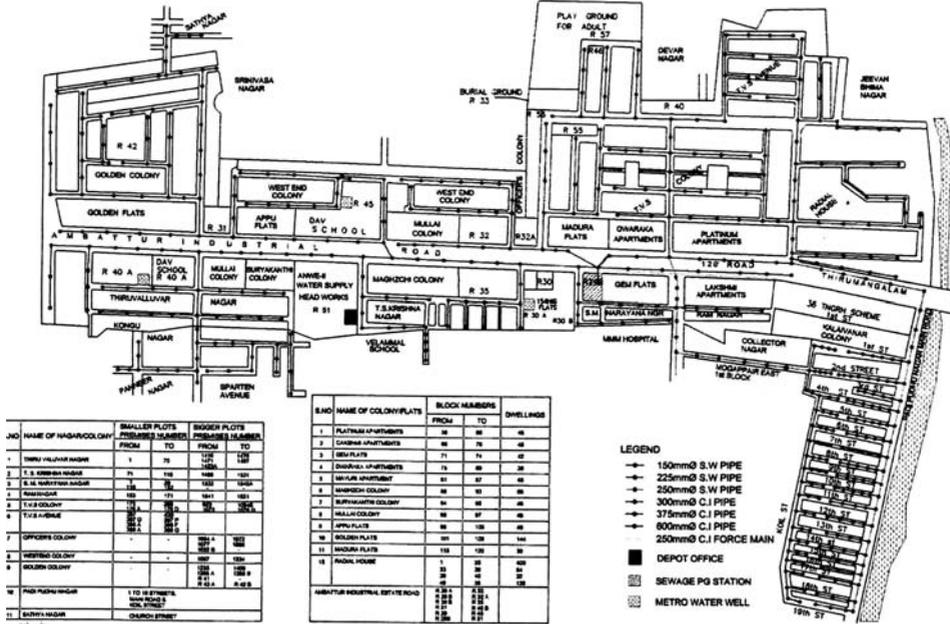
^aWhich brings us back to the classificatory logics that are written into these orderly and simplifying schema. On the ground in Chennai, principles of order diverge sharply between

APPENDIX E: MAP OF THE WATER DISTRIBUTION SYSTEM

Source: MCRC 1997.



**AREA - V
CMWSSB**



the water bureaucracy and residents of urban slums. For the bureaucracy, water supply through the piped system constitutes the core of orderly distribution, and populations that live at the tail end of this system, in unauthorised settlements, occupy the fringes of order. The notion of the 'tail end' is a critical synecdoche of the production of social order by the technical order of the grid. While the standard water allocation for the city is about 70 litres per capita daily (lpcd), the slums only got 20 or 30 lpcd, and sometimes less. Engineers usually explained this by noting that the slums were in a "tail-end pocket", being unauthorised settlements.

Slum residents are mostly served by mobile sources such as lorries or tanks: this is often untreated water. They also receive some piped (treated) water through public standpipes (or handpumps). These handpumps are sources of recurrent tension for the engineers, as they quickly become the locus of collusions and battles for control among local residents, politicians, party workers and other powerful interests in the slums. They have a tendency to be privatised – their handles are removed and privately stored, or locked – and they lend themselves to the discourse of the commons: "nobody maintains them, so they should be dismantled"³. In keeping with neo-liberal trends of rolling back the commons, by the late 1990s Metrowater had adopted a policy of gradually eliminating public standpipes and encouraging slum residents to get private connections.

Metrowater's steady drive toward commercialisation, stringent cost-auditing and user charges, and the mounting pressures on depot engineers to meet revenue collection targets, also sharpened the frontline engineer's hostility to the non revenue-paying populations of the slums. These populations were portrayed as demanding, disorderly, over-politicised and unwilling to pay – a type of 'public' that was becoming increasingly impossible for the reforming utility to serve (Coelho: 2005). In March 2005, one engineer declared: "Of all the people in this city, these are the people enjoying the most today! They don't pay taxes or charges, but they get 24-hours supply through the public standpipes, they use good treated water for everything – washing vessels, washing clothes, bathing!" She went on, "We are now trying to stop tank and truck supply as much as possible, because there is enough water coming through the pipes". However, this move encountered strong resistance in the slums, as tanks and trucks are a lucrative source of revenue for local party workers.

Interviews with women in slums revealed that the piped system was only one of a range of contaminated and irregular water sources they balanced to meet their needs. In S.P. Thottam, a complex of Tamil Nadu Housing Board tenements ringed by huts and shacks and small semi-thatched houses, women said: "We get handpump water for a few hours on alternate days, but this water sometimes has a drainage smell. We cannot always trust it. So we often have to use tank water for drinking, but this we always boil and strain. The lorries are not regular either – we cannot rely on them. Another problem with the handpumps is that water gets released at odd times – midnight, 1 am, you can never tell! Then a huge crowd gathers and starts jostling and pushing, because the water will suddenly stop. Many of the pumps don't work, so everybody crowds around one pump. A lot of fights and conflicts ensue. If you are really tough, you can push through and get some water – people like us cannot do that^a This is why we are insisting on tank water being continued. As soon as the summer comes, they will stop supplying through pipes. At least if the tank water comes everyday, we can be sure of a few pots".

In Avvainagar, where tenements and small *pukka* (permanent) houses are flanked by rows of thatched huts clustered along the banks of the river Cooum, women claimed that the area's three public fountains had not worked for nearly five years, as the local water boss, Velu, deliberately kept them in disrepair by removing washers or other parts, or tethering his cattle near the pumps so that the place was covered in cowdung. Thus, the entire community was kept dependent on water supplied by trucks that he controlled. However, they claimed: "When we had a pump here, one family controlled it. They had no formal authority, but they would hang on to it and fill every container they had, then wash some vessels, then by the time they were done, the water would stop. We paid nothing, but had no assurance of getting water. At least with the trucks one person controls them and makes sure the water is distributed".

Women in slum communities, thus, outline dense strategies of water security, involving multiple modes of access, to negotiate problems in relation to quality, timing and reliability.



These strategies are shaped by the politics of local control over sources, as well as by the double-game of the water bureaucracy as it tries on the one hand to eliminate standpipes, and on the other to stop mobile supplies as soon as piped water becomes available.

Water strategies in the slums are also shaped and encased by evolving practices of urban democracy. Elected councillors function as channels for complaints about water and sanitation in the city; many have their fingers firmly on the pulse of problems in the back alleys of the city wards. In many depots, engineers engage closely and routinely with the councillors, and prioritise complaints brought in by them. Despite this, engineers tended to characterise their obligatory daily truck with politicians as a massive nuisance and a source of daily tension. Even the illegal connections that were so ubiquitous in the system were commonly ascribed to a lumpen political influence, especially in poorer divisions. Most engineers argued that it was because of the politicians that people in the slums had become so demanding: "There is a real problem now of the public being given too much weightage in our department. Even uneducated people now know where the depot office is, who the Assistant Engineer is, what we are supposed to do. They are more arrogant now. Earlier they would not sit on the roads [in protest]! All this is because of the media and because of politicians!"

Thus, in a reform framework that defines 'good service' as financially viable response to consumer demand, the urban poor are marked as undeserving, partly because they are seen as the protégés of populist political regimes responsible for the 'institutional failures' of state-run utilities. One middle-level engineer expressed this in strong terms: "The main reforms we need in Metrowater are to educate the public and to remove political interference. This has become a government of the slums. It only wants to supply water to the slums, to people who cannot pay!"

Daily relations between engineers and local politicians at the frontline in the context of the reforms thus reproduce antinomies of order and corruption, official and unofficial, service and patronage, 'us' and 'them'. Meanwhile, their casual claim – "everybody knows there are illegal connections" – indexes a shared field of practice between frontline state personnel, the public, and politicians.

In Metrowater, despite, or because of, what everybody knew, formal knowledge about the underground system remained schematic and incomplete. Official knowledge, as carried in official maps of the grid, is constituted through an assemblage of pieces from narrative history, scientific extrapolation, popular knowledge and guesswork. A Metrowater engineer revealed how much officials relied on the local knowledge of residents and depot labourers: "When I am out there trying to fix a leak, it is often the public that comes and points out, 'Sir, this is where there is a joint, or a sluice valve, this is where somebody had fixed a leak some time back'". This account was corroborated by a city councillor: "There are no blueprints at all for the pipes that have been laid, they [the Metrowater staff] rely on us to tell them where the pipes are! They have some maps at the depots, but these are 25 years old and they are not updating them. It is only the old employees of Metrowater who know the real facts of the pipes, where the loop lines are, where the valves are. They tell the new AEs [Assistant Engineers]".

Transparency and Secrecy

Discourses of transparency often serve as masks under which the routinised secrecy which marks the culture of rule can continue to operate. Metrowater, like other reforming bureaucracies in India, loudly touts its new culture of transparency, in which the exchange of information through Citizen's Charters, Open Houses, and 24-hour complaint hotlines is a keystone. These efforts, however, are all conceived and carried out on the model of public relations, wherein the substance of the service interface is limited to a complaint-response and consumer-education mode. Clients are allowed to ask a predictable set of questions or to complain in specified formats. The engineers, in response, must "give explanations". The mode of public relations displaces the goals of transparency by covering up the failures of the system and orienting itself to appeasing consumers. As one engineer put it, "We are engineers, supposed to supply water, but we can never adequately supply, so our main job is to convince people^a People basically want to be sure of their supply, if not today, that they will at least get it soon. So you have to give them assurances, make them feel comforted, even if the government is not capable of fulfilling the promises".

On the other hand, I found that when clients posed questions about the operation of the grid, they were blocked by well-established bureaucratic devices for withholding information, honed by the new public relations skills. One such device commonly used by depot engineers is the discourse of "practical difficulties" (as in the context of valves, cited earlier in this essay), a term employed to convey a confluence of technical problems, resource constraints, disorderly histories and routinised secrecy, and serving to effectively exclude people from any substantial knowledge of or input into agency decisions and procedures. At certain moments, then, myths of disorder serve the purpose of state as well as myths of order.

For all of the rhetoric of transparency and the emphasis on data collection and dissemination, I faced an enormous challenge trying to get simple figures on water allocation across city zones for a given moment in time. Middle-level officials were puzzled that I was interested in such matters, which they believed were "too technical". The higher I went in the bureau, the more it seemed that this data was "not available" in the bureaucratic sense, where it is never made clear whether the data exists and won't be given out, or is simply not collected. When I finally got to the Chief Engineer, he confessed that these were matters kept close to the chest for frankly political reasons:

Data on allocation is maintained informally – if it is made public, everybody will ask for more. It is not necessary for people to know these details. People will start asking more, arguing. We cannot curb sectarian tendencies in our society. In most utilities where availability is a problem, they don't publicise such data.

Thus we are back to the classic Hobbesian "reason of state" – the need for controlled order to counter the "sectarian tendencies" that threaten anarchy. Yet, almost immediately, this senior official revealed the shaky foundations of this bid for order – the random criteria by which water is allocated:

After trying different things we arrived at population being the best indicator, but many areas have a floating population so even this is a problem. And then the whole city is not zone-based, it is a mix of trunk mains and zones, so it is not a watertight system. We just calibrate according to experience – it is a constant process of trial and error. I allocate a certain amount, then I see if there are complaints. If there is no panic, I may even reduce it. We watch the complaints – from the press, from Area Offices. It is a constant process of calibrating and modifying.

Thus, while access to information is central to the reforms, when it comes to the closely guarded resource at the heart of the service, information does not even exist as objective data. Instead, it is produced as knowledge, the specialised and ineffable knowledge of the experienced expert (cf. the work of the US historian of science, Theodore Porter (1995)), which is held as the linchpin of public order. The push for public accountability has somehow never penetrated to this realm, perhaps because paradigms of accountability are fleshed

out in terms of "complaints", which frame water as an issue of individual household consumption rather than one of a public asset to be collectively managed and used.⁴

Conclusion

The legibility and standard format of the grid are, according to James Scott, the premises of administrative and political control in the authoritarian high modern state. But this ethnography suggests that the myth of the orderly grid needs to be continually and ritually enacted through the mapping exercises and the policing excavations of engineers. Yet it is a myth that both the officials and large sections of the public recognise, in their daily unacknowledged and understated relations, as myth. The subterranean transgressions, well known and taken for granted, are part of the common lore of state societies. Yet, as the anthropologist Michael Hertzfeld (1992) suggests, it is these very shared secrets, these games played on both sides of the bureaucratic service counter, that maintain the theodicies, the intimacies and the indifference of nationalism.

Recent reforms in Metrowater involve attempts to fill in and complete information about the underground system, to regularise the voluntaristic extensions of water rights. This ethnography found, however, that despite the careful mapping and the ever-increasing data, thorough legibility is never entirely achievable. This is not only because policing is almost prohibitively expensive for systems this vast and intimate – whether above or below ground – but also because local officials are complicit in the local mediations that resist legibility. It is impossible to wipe out local knowledge – partly because officials are part of the people. Rather than a model of state order produced by the reductive and schematic gaze of officialdom, and opposed to the disorder of the ground, this essay presents a scenario of collaboration in which the officials of the state are engaged on both sides of the relation that produces the idea of state sovereignty.

The subversive ground-level transactions between people and lower officials offer a practical critique of high modernist aspirations: they suggest that the formal order of centralising and monumental schemes does not work for all citizens. Local dialectic engagements, like dialects, may contain organic solutions to the exigencies of everyday life, revealing multiple loci of power and opportunity, multiple points of entry and exit. While this ethnography presents a critique of totalising forms of state, it is even more a critique of neo-liberal anti-statism or rather anti-welfarism, which only sharpens processes of homogenisation to facilitate cost-auditing and market disciplines. The global reach of markets and capital relies on a global standardisation of systems, units, mechanisms. The sort of illegibility described here, then, may provide a vital margin of political safety from control by outside elites.

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NOTES

1. This essay is based on my doctoral dissertation, titled "Of Engineers, Rationalities and Rule: An Ethnography of Neoliberal Reform in an Urban Water Utility in South India". It also draws on subsequent work I did as a Sarai Independent Fellow in 2005.
2. In *The Pasteurisation of France* (1988), Latour contends that non-human actors – in his case, microbes – exercise a powerful agency in reorganising society at specific historical junctures. "(T)he Pasteurians^a redefined the social link by including the action of the microbes in it^a (T)he action of the microbes redefined not only society but also nature^a" (p. 38). My point here is that key objects in the landscape of the city exert action on the social domain, conditioned by as well as conditioning human action. Society not only comprises, but is often *made* by objects like big dams.
3. The "tragedy of the commons" argument put forward by the American ecologist Garret Hardin in 1968 held that unrestricted access to common-pool resources such as pastures spelt the destruction of the resource due to over-exploitation by individual users. This, he argued, occurred because the benefits of exploitation accrued to individuals, while the costs of exploitation were distributed among several users. Hardin's work was often cited in the 1980s in making the case for privatisation of common resources.
4. See Coelho (2005) for a fuller discussion of the "complaint" as a mechanism through which the service is structured and information exchanged across the counter in Metrowater.

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