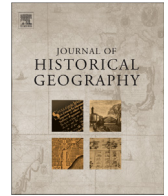


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## Pollution, toxicity and public health in metropolitan India, 1850–1939

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## Abstract

'Toxic discourse' has a long history in the context of India's urban environment. Using the examples of the two leading metropolitan centres, Bombay and Calcutta, this article shows how the diverse and changing problem of pollution was identified and addressed over time. Ideas of pollution and poisoning were closely associated in the nineteenth century, and related to human as well as animal waste, and, increasingly, to industrial activity and mechanized transport. Many of these developments and their intended solutions mirrored European experience, but in India 'pollution' served as an environmental as well as a ritual concept: it could be deployed to exoticize and exceptionalize India or to oppose, complement and qualify the Western understanding of the term. The invocation of toxicity in colonial pharmacology and medical jurisprudence partly overlapped with the evolving environmental discourse on poisoning and pollution but became increasingly distinct from it by the early 1900s as toxicology acquired a more precise meaning and distinct technical agency.

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Despite the recent, analytically insightful, interventions of historical geographers,<sup>1</sup> many aspects of the colonial and postcolonial histories of India's major cities remain empirically unexplored or theoretically undeveloped. Among the most crucial of these *lacunae* is the history of pollution which has, as yet, only marginally entered into the discussion of South Asian urban, medical and environmental history.<sup>2</sup> Pollution has an obvious contemporary relevance—in terms of present-day traffic pollution and attempts to 'green' Indian cities, in the light of the harm caused to human health and the environment by industrial leaks and toxic discharges (of which the Bhopal gas disaster of 1984 has been the most catastrophic example), and through the use of the courts and public interest litigation to curb urban and industrial pollution.<sup>3</sup> Studies of the human impact on the environment often invoke the apocalyptic.<sup>4</sup> This paper is concerned, however, with an environmental epiphany: how pollution in its various forms came to be understood as an environmental health issue for India's

metropolitan centres, Bombay (Mumbai) and Calcutta (Kolkata), during the nineteenth and early twentieth centuries, informing and reflecting wider patterns of urban spatiality and colonial governance.<sup>5</sup>

The paper considers the ways in which the term 'pollution' was employed in sanitary and environmental discourse in urban India from the 1850s onwards. This in part followed current usage in Britain but it also reflected the distinctive cultural connotations of the term in South Asia. The paper further seeks to trace the evolving relationship between interconnected concepts of pollution and poisoning and so to address for India issues raised by Lawrence Buell's discussion of 'toxic discourse' and its environmental implications.<sup>6</sup> As he observes: 'Contemporary toxic discourse effectively starts with Rachel Carson's *Silent Spring*', a work which, in the course of evoking an apocalyptic view of environmental change, travels repeatedly between a language of poisoning and lexicon of pollution.<sup>7</sup> Since both terms were widely employed in the colonial

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<sup>1</sup> M. Gandy, The bacteriological city and its discontents, *Historical Geography* 36 (2006) 14–25; S. Legg, *Delhi's Urban Governmentalities*, Oxford, 2007; C. McFarlane, Governing the contaminated city: infrastructure and sanitation in colonial and post-colonial Bombay, *International Journal of Urban and Regional Research* 32 (2008) 415–435.

<sup>2</sup> For some exceptions, see D. Chakrabarty, Open space/public space: garbage, modernity and India, *South Asia* 19 (1991) 15–31; S. Kaviraj, Filth and the public sphere: concepts and practice about space in Calcutta, *Public Culture* 10 (1997) 83–113. For the importance of placing disease at the centre of environmental histories, see L. Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge*, Berkeley, 2006.

<sup>3</sup> Several of these issues were highlighted in the 1980s in two reports from the Centre for Science and Environment in New Delhi: *The State of India's Environment, 1982: A Citizens' Report*, New Delhi, 1982; *The State of India's Environment, 1984–85: The Second Citizens' Report*, New Delhi, 1985.

<sup>4</sup> L. Buell, *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture*, Cambridge, MA, 1995, chapter 9.

<sup>5</sup> In 1891 Calcutta had a population of 744,249, rising to 1,013,143 in 1911 and 1,163,771 by 1931. Over the same period, Bombay's population rose from 821,764 to 979,445 and 1,161,383. India's third city, Madras (Chennai) was substantially smaller, with 452,518 inhabitants in 1891 and 647,230 in 1931. K. Davis, *The Population of India and Pakistan*, Princeton, 1951, 132.

<sup>6</sup> L. Buell, Toxic discourse, *Critical Inquiry* 24 (1998) 645.

<sup>7</sup> R. Carson, *Silent Spring*, London, 1963, 5, 11, 127, 143.

urban milieu, it is worth considering how these concepts were deployed and acquired specific meanings.

Focussing on big-city environments makes it possible to enlarge on one of two main paths to 'environmental governmentality' in colonial and postcolonial India.<sup>8</sup> Although colonial governance before the Second World War can broadly be understood within a framework of *laissez-faire* doctrine and non-interventionist policy, there were, environmentally speaking, two contrary trends. One was primarily rural and informed attempts from the 1870s to protect and regulate such 'natural resources' as forests, rivers, wildlife and fisheries. For this strand of environmental interventionism the Forest Act of 1878 was a critical exemplar.<sup>9</sup> The other, slightly earlier, trend related to municipal governance. Following British precedent, India's metropolitan cities acquired the legal authority to regulate and police the urban environment. Municipal bodies, acting environmentally in the cause of public health, were equipped with a wider range of regulatory powers and specialist agencies than the provinces (Bombay and Bengal) over which they presided. As Colin McFarlane has remarked of nineteenth-century Bombay, the 'contaminated city' and the public health regime presented as its solution 'was not just the *domain* of government', but was itself '*productive* of government'.<sup>10</sup> Bombay's Municipal Act of 1865 was closely followed by the formation of a municipal health department and the appointment of an executive health officer.<sup>11</sup> Despite the self-interested caution, even overt opposition, of many municipal councillors, the local authorities were well positioned to foster awareness of (and devise solutions to) environmental issues that were seen as city-specific or to exist in more extreme form in the metropolis than in the surrounding countryside.

### Animal cities

As McFarlane observes of Bombay's nineteenth-century health officers, 'addressing sanitation meant dealing with nature'. Citing the reports of Dr A. H. Leith (whose analysis of mortuary returns helped establish a new medico-environmental awareness and interventionist agenda in metropolitan Bombay), he notes the author's frequent references to soil, tides and coasts, to air, animals and groundwater, fever, bodies and human waste. As a domain of intervention, 'sanitation brought city and nature together'.<sup>12</sup> Like many other modern urban environments, the cities of British India were home to animals as well as people—animals that provided human residents with food and drink, served the needs of transport and industry, and lived on human profligacy and waste. Animal geography helped give fine-grain definition to urban spatiality and to refine practices of urban inclusion and exclusion.<sup>13</sup>

While Bombay and Calcutta had human populations of close to one million each by 1900, it is difficult to establish the size of their animal populations and to assess the significance animals had for

the pursuit of human health and effective urban governance. However, the annual reports of Bombay's municipal health officers give some indication. For instance, large numbers of cows and buffaloes were kept in the city and were the main source of the urban milk-supply. In 1873 there were an estimated 1,972 milch animals in Bombay, with two inner-city wards alone accounting for almost 800 animals. Since cows, pigs and other domesticated animals were mostly kept to provide poor households with an income, animal densities tended to correlate with pockets of urban poverty and slum habitation.<sup>14</sup> As well as being revered as sacred animals, cows were saved from exclusion by their utility, as a source of nutrition and income for the poor and of cow-dung fuel. Despite increasing importation of milk from Nadiad in Gujarat and elsewhere, in 1924 there were still 93 licensed cattle-stalls in the city, housing 5,000 animals and yielding 18,000 gallons of milk a day.<sup>15</sup> Bombay was not alone in having high animal densities: in 1864 Poona (Pune) had nearly 10,000 cattle for a town of 80,000 people, almost one cow for every human household.<sup>16</sup>

In nineteenth-century urban sanitary discourse, animals served several rhetorical functions. Although their contribution to the city's well-being was recognized, the animals (and, in the case of cows and buffaloes, the milk they produced) were seen as a danger to health and as the intrusion into the modern metropolis of forms of nature more appropriate to the countryside. The fact that most cattle in Bombay were located in slum districts signalled a recurring theme—the responsibility of the poor and the occupations of the poor for urban pollution and disease. Animals were crowded into small sheds that were almost devoid of light, ventilation and drainage: the owners lived above or alongside their animals. In contemporary miasmatic thought, pollution was intimately linked to disease. Thus Bombay's health officer, T. G. Hewlett, wrote in 1866: 'The heat, the faint sickening odour, the walls moist with the exhalation from the animals, the stifling smell of ammonia, make one sick on first entering the stables ... an atmosphere impregnated with such impurities must be unhealthy'.<sup>17</sup> With animal dung, litter and fodder fouling streets and blocking drains, pollution conveyed the idea that animals were, in human terms, dangerously out of place in the sanitary city. Cattle could not be excluded from urban spaces, but successive health officers sought to impose strict control over the stabling of animals and the cleanliness of surrounding yards. All cattle-sheds had to be licensed by the municipality, with negligent owners fined for non-compliance. Just as the ventilation needs of prisoners in their cells and soldiers in their barracks were precisely delineated so the air and space required for each animal was carefully specified.<sup>18</sup>

Perceptually and materially, the well-being of Bombay's human inhabitants was closely bound up with its animal population. In the 1890s the municipal health department maintained 2,000 bullocks, all of which required to be stabled, fed and cared for when sick, before eventually dying of old age and debility.<sup>19</sup> Bullocks

<sup>8</sup> K. Alley, *On the Banks of the Ganga: When Waste Water Meets a Sacred River*, Ann Arbor, 2002, 22.

<sup>9</sup> R. Guha, An early environmental debate: the making of the 1878 Forest Act, *Indian Economic and Social History Review* 27 (1990) 65–84.

<sup>10</sup> McFarlane, *Governing the contaminated city* (note 1), 422.

<sup>11</sup> For public health in Bombay, see M. Dossal, *Imperial Designs and Indian Realities: The Planning of Bombay City, 1845–1875*, Delhi, 1991, chapter 5.

<sup>12</sup> McFarlane, *Governing the contaminated city* (note 1), 418.

<sup>13</sup> C. Philo, Animals, geography, and the city: notes on inclusions and exclusions, *Environment and Planning D: Society and Space* 13 (1995), 655–681; C. Philo and C. Wilbert (Eds), *Animal Spaces, Beastly Places: New Geographies of Human-Animal Relations*, London, 2000.

<sup>14</sup> Annual Report of the Health Officer [hereafter ARHO], *Annual Report of the Municipal Commissioner of Bombay, 1873* [title later changed from *Annual Report to Administrative Report*: hereafter cited as ARMCB], 76–83.

<sup>15</sup> ARHO, ARMCB 1923–24 (note 14), 40.

<sup>16</sup> A. Leith, *Report on the Sanitary State of the City of Poona*, Bombay, 1864, 4.

<sup>17</sup> ARHO, ARMCB 1866 (note 14), 4.

<sup>18</sup> ARHO, ARMCB 1873 (note 14), 76–83; ARHO, ARMCB 1880 (note 14), 311–312; J. Jones, *A Manual of Hygiene, Sanitation and Sanitary Engineering with Special Reference to Indian Conditions*, Madras, 1896, 9.

<sup>19</sup> ARHO, ARMCB 1892–93 (note 14), 422.

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