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ARTICLE



The Smell of Caste: Leatherwork and Scientific Knowledge in Colonial India

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ABSTRACT

Leather was an important commodity for the British empire in terms of industrial production and scientific innovation. From the mid nineteenth century in India, the British sought to convert leatherwork into a scientific industry. Leather, however, also has a life in caste. The profound stench inherent to the process of leather tanning marks leather workers as polluted. Examining archival material and contemporary ethnography from Uttar Pradesh, this paper examines how the scientific colonial intervention in leatherwork was made complicated due to the sensorial politics of caste. The leather chemist, trained to impart scientific knowledge to leather workers, often failed to negotiate the caste-based sensorial nature of leatherwork, thereby allowing caste to limit the reach of modern science in the industry. Understanding this interaction between colonial science and leatherwork has important consequences for our understanding of the politics of caste and scientific knowledge in India.

KEYWORDS

Caste; leather; science; senses; smell; Uttar Pradesh

Introduction

In 1910, the Government of India decided to appoint a leather expert at the Madras Tanning School. Allan Guthrie, who was then working with Allen Cooper and Co. in Cawnpore (now Kanpur), emerged as the main contender for this post. According to Henry R. Proctor, professor of Leather Industries at Leeds University, Guthrie was ‘quite a good chemist’, with ‘many years of Indian experience’ and ‘very much interested in Indian tanning’.¹ In June 1911, Proctor wrote to the India Office, recommending another student, B.M. Das, for the post of lecturer in leather manufacture in India. Das, Proctor informed the India Office, would obtain an MSc in Chemistry of Leather Manufacture from Leeds that year. He was, according to Proctor, ‘a man of great scientific ability and a careful and accurate scientific worker’.² In the application Das sent to the India Office, he claimed to have specialised both theoretically and practically in

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1. ‘Proposed appointment of Mr Allan Guthrie’, 10 October 1910, National Archives of India (henceforth, NAI), Home, 55–57.

2. *Ibid.*

chrome tanning with the best authority in the field.³ He already held a Master of Arts in Chemistry from Presidency College, Calcutta (now Kolkata), and had now further trained in leather chemistry. By August 1911, Guthrie had been formally appointed as a leather expert in Madras (now Chennai). The Department of Education noted that Madras might not 'welcome Mr. Das in a post of Rs. 750 a month'.⁴ It was suggested that he might be considered for other posts.

Allan Guthrie went on to become the founding principal of the Leather Trades School in Madras in 1915 and was considered an expert in chrome tanning.⁵ B.M. Das eventually became the director of the Bengal Tanning Institute, and, later, the first director of the Central Leather Research Institute, Madras, in 1953.⁶ Das was an important figure for leather education in post-Independence India, serving as Leather Advisor to the government of West Bengal and as the chairman of the Planning Commission.⁷ The careers of these two men, both with notable 'scientific ability', are indicative of the scientific and policy changes that occurred in the leather industry starting from the mid nineteenth century in India. The British colonial intervention in trades and crafts through the late nineteenth and early twentieth centuries produced many structures and processes that came to define the nature of the Indian industry in the decades to come. In particular, the emphasis on science and scientific aptitude not only changed how leather was produced, but also fundamentally influenced who was involved in leather manufacture.

Leather as a social object is constituted simultaneously through its importance as a trade commodity, its complex sensuousness as both an object of desire and disgust, and, most importantly, through its close entanglement with caste.⁸ 'Experts', such as Guthrie and Das, were introduced into the industry for the purposes of creating efficient manufacturing processes. Yet this had important consequences for how caste operated in the industry and, consequently, for how caste-based sensorium and sensorial perception came to be framed within the process of leather manufacturing. This paper concerns itself with this interaction between leather, caste and sensuousness by keeping an eye on the figure of the 'leather expert'.

Leather has always been an important commodity for colonial and post-colonial states due to its utilisation in industry, warfare, footwear and apparel trades. Leather exports and control over the international leather market were important for imperial powers like Britain throughout the nineteenth and twentieth centuries. Alongside its political and economic importance, leather's provenance in animal bodies has

3. 'Application of Mr. B.M. Das for appointment to some post in India as a leather expert', 20 June 1911, NAI, Education, 60.

4. 'Appointment of Mr A. Guthrie as Leather Expert in Madras', 25 August 1911, NAI, Education, 60.

5. Shahana Bhattacharya, 'Caste, Class and Stigmatised Work in Leather Production in India: Some Reflections', in Toshie Awaya *et al.* (eds), *Examining Stigmatisation of Leather Industry: By Focusing on the Labour Forms of Dalit and Buraku* (Tokyo: FINDAS Tokyo University of Foreign Studies, 2020), pp. 33–62 [40–1].

6. *Ibid.*

7. *Ibid.*

8. In this essay, leatherwork mostly refers to the process of tanning raw hides. 'Leather' has been used as a generic term for both the intermediate stages of leather like wet-blue and the finished product. Hides refer to the skin of the dead animal, which is used to make leather. The raw hide and the tanning process are considered to be the most polluting parts of leatherwork. Finished leather, being no longer organic, is supposed to be somewhat less polluting. It is for this reason that leather goods manufacturing is often regarded as a separate industry from tanning. Manufacturing also employs workers from many castes as compared to the relatively higher concentration of Chamar workers in the tanning industry.

transfused it with a complex social nature. Leather production and leatherworkers are often viewed with disgust in many parts of the world due to the highly malodorous nature of leatherwork, as well as the visual, olfactory and tactile proximity of leatherworkers to dead and rotting animal hides and skins.⁹ On the other hand, finished leather's organic nature—and, ironically, its very proximity to animal bodies—also endows it with a perception of luxury, affluence and a strong sense of masculinity. In India, leather is further situated in the Hindu caste discourse that signifies it as a polluting object, especially in the form of raw hides.

The work of tanning is thus mostly performed by caste groups such as the Chamars in North India, who continue to labour in a degrading occupation because of their ascribed and hereditary caste status as 'untouchables'.¹⁰ In particular, it is the smell of leather tanneries that seems to evoke the strongest emotions of disgust and repulsion in a society ordered by caste. The experience of smelling the odours of tanneries and of working with these odours is one of the most potent ways in which the phenomenological experiences of caste can be accessed in leatherwork. The object of leather brings along with it the olfactory dimension of caste, especially in the leather industry, where caste can primarily be smelt even before it is visible or tangible in terms of concrete numbers or identities. This juxtaposition of leather, leatherwork and the leatherworker in the economy of consumption and desire on the one hand, and the sensorial and affective registers of disgust on the other, is an important element in understanding the relationship of leather to caste and sensory politics in colonial India.

This essay examines how the British intervention in the field of science and technical education confronted and negotiated with the sensorial politics of caste within the leather industry in the United Provinces. The introduction of modern science, mainly through chemical tanning, inaugurated commercialised leather production in regions like the United Provinces, led to employment creation, and increased industrial output. This also created some emancipatory conditions for the 'untouchable' leatherworkers. However, this paper argues that this regime of efficiency and the rationality of modern science, represented by figures like Guthrie and Das, failed to confront the disgust produced by caste attitudes in the realm of leatherwork. This allowed caste to retain disgust as the affective structure through which leatherwork is framed in the colonial and post-colonial periods. Examining colonial archival debates along with ethnographic field research in Uttar Pradesh, this paper shows how understanding this affective caste register underlying the 'modern' leather industry is crucial for our understanding of how caste intersects with capitalist modernity and science.

The essay is divided into three sections. The first section situates leather and the leatherworker in the sensory politics of caste. The second section focuses on the colonial relationship forged between Britain and India in the fields of science, technology

9. See Joseph D. Hankins, 'An Ecology of Sensibility: The Politics of Scents and Stigma in Japan', in *Anthropological Theory*, Vol. 13, nos. 1–2 (2013), pp. 49–66.

10. The paper, while using the term 'Chamar' for the leatherworking castes of Uttar Pradesh, recognises the derogatory nature of the term and does not endorse the same. There are many individuals and groups who continue to refer to themselves as 'Chamars' in order to reclaim and resignify the term. They also take pride in knowledge of leatherwork and thus associate the term 'Chamar' (*chrm*, meaning skin) with their skill and history. Where the context demands, community-defined terms such as 'Dalit' and 'Jatav' will be used instead of 'lower caste' and 'Chamar', respectively.

and caste. The third section then examines the influence that these ideas had on the leather industry in India, particularly focusing on the ways in which the sensorial arrangement of spaces, bodies and objects in leatherwork constituted, reconstituted, affirmed and challenged caste practices and norms.

Caste and the odours of leather

Chaman Lal, an elderly Jatav leather shoe factory worker in Agra,¹¹ specialises in fitting shoe uppers to soles. On an autumn afternoon in 2013, I met him in a local market in the city for a conversation about his thirty years of experience of working in the industry.¹² Chaman Lal is quite assertive that working in the shoe factory provides him with dignity, irrespective of what people might perceive leatherwork (*chamde ka kaam*) to be like. 'This leather does not stain (*nishaan*) our skin (*chamdi*)', he explains. Curious about the 'stain' of leather, I request him to elaborate. Chaman Lal pauses for a brief while, as if thinking of the best way to explain something complex. 'Local made leather (*desi chamda*) tanned in the villages used to stain our hands red (*laal*) but working on English leather shoes (*angrezi joote*) is a clean job (*saaf kaam*)', says Chaman Lal very slowly. 'Those red hands would smell of leather (*chamde ki badboo*) and other people would stay away from us. Now we are factory workers who do modern work in the city. No one knows who we are because we are not marked by the colour or the smell of leather', he continues.¹³

In this brief exchange, Chaman Lal referred to a large and complex slice of history of leather production and its relationship to caste and technology in India. The 'modern' work conditions of the leather factory and the factory itself were created by the colonial administration during the second half of the nineteenth century in places like Cawnpore in the United Provinces. The use of machines, which, in the experience of workers like Chaman Lal, creates a barrier between the animal and human skin, was an important intervention made by these factories. 'We don't touch the hide as closely (*kareeb se*) as we used to. Now we work with machines (*mashini kaam*), like any other factory work', asserts Chaman Lal. Machines also allowed the workers to stand upright while making shoes, starkly different from the experience of sitting in a crouched position on the floor in a more traditional set-up. 'We now don't sit on floors and bend down to work (*jhukte nahin hain*), we have high work-stations (*oonche table*)', says Chaman Lal with a sense of pride.

Leather manufacture comprises four stages: pre-tanning, where organic material such as blood, fat and hair is removed from the hides; tanning, where chemicals such as Chromium-6 are used for 'stabilisation of the protein matrix' of the hide, creating a wet-blue form of leather resistant to organic decomposition; post-tanning, where

11. Names have been changed to protect identities. Most fieldwork conversations happened in a mix of Hindi and English. Translation to English has been done by the author.

12. Owen Lynch's work on the Agra shoe industry shows how the Jatav sub-caste of the Chamars could emerge as a dominant caste, socially and economically, on the basis of their success in the leather industry as workers, agents and owners: Owen Lynch, *The Politics of Untouchability: Social Mobility and Social Change in a City of India* (New York: Columbia University Press, 1969).

13. Chaman Lal here used the word 'modern' in English and in its popularly accepted meaning as something new and progressive.

wet-blue is processed with oils and chemicals to give it the characteristic leather texture and look; and, finally, finishing, which provides leather with its colours and patterns.¹⁴ Leather manufacture is thus a combination of mechanical and chemical processes. The biggest advance in leather manufacture has happened in its chemistry, in particular with the introduction of Chromium-6. This chemical has vastly reduced the time required for tanning, which in turn has aided commercial production. The earlier form of tanning, with the use of organic products such as *babool*, oak bark, valonia, divi-divi and myrobalan nuts, used to take several days and produced lower quality leather in terms of elasticity and resistance to water. Chrome tanning quickly replaced vegetable tanning in the large tanneries around the first and second decades of the twentieth century. Vegetable tanning, however, continues in small household-level units in rural areas even today. The shift from using vegetable products to chemical compounds for tanning, Shahana Bhattacharya argues, signalled a shift in the basis of knowledge production in the industry by cementing the place of the chemist and of exact, standardised processes, which was a stark contrast to the kind of tanning expertise found in the tanning practice in India.¹⁵

The 'red stains' on Chaman Lal's hands, caused by tannins present in the organic compounds, are for him the mark of caste on his body. Factories and the regime of modern science thus allowed some 'untouchable' leatherworkers to simply become workers and to negotiate with the bodily experience and stigmas of caste to some extent. Pointing out a significant dynamic of this movement towards the city to work in a factory, Maren Bellwinkel-Schempp writes: '[f]rom all over Uttar Pradesh the Chamars migrated to Kanpur.... In Kanpur town they became "tanners"—as the British translated their name Chamar—what most of them had never been in the village'.¹⁶ The pollution of leatherwork was retained in these new industrial spaces and in identities like those of 'tanners' or 'workers'. Yet many of these workers could leverage their factory occupation, or even their connection to leatherwork, to gain social and economic mobility. Sudha Pai, for instance, argues that most leaders of the Uttar Pradesh Scheduled Caste Federation and the Republican Party of India, such as B.P. Maurya, were sons of leather merchants and could get higher education due to the prosperity provided by the trade.¹⁷ However, this was not a universal experience. Chaman Lal's journey from rural tanning to a shoe factory is quite different from the experiences of tannery workers in places like Kanpur, where tanneries have not been modernised enough, nor has caste been negotiated to the extent that Chaman Lal reports.

The caste system, B.R. Ambedkar argues, 'is not merely a division of labour. It is also a division of labourers'.¹⁸ Caste, derived from Hindu religious discourse, is a system of ascribed value-based categorisation centred on principles of purity–pollution,

14. R.L. Sykes, 'The British Leather Industry', in *Journal of the Royal Society of Arts*, Vol. 120, no. 5189 (April 1972), pp. 285–97 [286].

15. Shahana Bhattacharya, 'Transforming Skin, Changing Caste: Technical Education in Leather Production in India, 1900–1950', in *The Indian Economic & Social History Review*, Vol. 55, no. 3 (2018), pp. 307–43.

16. Maren Bellwinkel-Schempp, 'From Bhakti to Buddhism: Ravidas and Ambedkar', in *Economic & Political Weekly*, Vol. 42, no. 23 (9–15 June 2007), pp. 2177–2183 [2177].

17. Sudha Pai, *Dalit Assertion and the Unfinished Democratic Revolution: The Bahujan Samaj Party in Uttar Pradesh* (New Delhi: Sage Publications, 2002), p. 39.

18. B.R. Ambedkar, *Annihilation of Caste: The Annotated Critical Edition* (New Delhi: Navayana, 2014), p. 234.

occupational segregation, endogamy¹⁹ and, ultimately, 'graded hierarchies'.²⁰ Caste hierarchisation is based on the fundamental idea that each caste is inherently lower and thus more impure than the ones above it and higher and purer than the ones below it.²¹ Contact with those considered 'lower' thus has the capacity to pollute, as does contact with polluting materials, such as body fluids, dead bodies, soil, hair, skin or dirt, through their touch, sight, sound, taste and odour. Ascribing 'polluting' occupations such as leatherwork to the 'untouchable' caste groups such as the Chamars is one way in which pollution is sought to be contained. In particular, it is the malodour of the tanning process that is often considered to be emblematic of the pollution caused by leather and the leatherworker.²²

Sunder Sarukai, in thinking phenomenologically about untouchability, argues that one must consider the phenomenon through the idea of *samyoga* (contact). In *samyoga* lies reciprocity: two bodies in contact are in a symmetric relationship with each other because of the eradication of distance between the two.²³ This eradication of distance, which does not happen in mere 'touching' (*sparsha*), could thus be one of the necessary conditions for the transference of the properties (polluting or purifying) of one body to the other. In South Asian religious traditions around the senses, smell is often considered to be a contact sense because the 'odorous particles released from an odorant' require 'bodily contact' for the transference of the odour to the one smelling.²⁴ Further odours require the intervening medium of air to be transmitted, and air is considered to be closely associated with the sense of touch.²⁵ It could then be argued that within a socio-religious sensory context, when one smells an object, particles of the object come in bodily contact with the person performing the smelling. This contact between the odorant and the body of the person smelling can thus fundamentally alter the latter's state of being. In terms of caste, this could explain the potency of avoiding contact with 'polluted' objects and persons as well as the faith in the purificatory nature of other objects and rituals.

Odours thus get embroiled within ritual and hierarchical status within the caste system. Examining the history of aromatics in Hindu scriptures, James McHugh teases out a fascinating scheme of ordering animal bodies, odours and material objects based on a sixteenth century text from Kerala: *Matangalila* (*The Play of Elephants*). Written by an individual called Nilakantha, the text provides detailed classification of elephants in terms of *varna*. The Brahman elephant is 'pure', 'smells as honey, milk', 'ghee' or 'mango blossom', 'is fond of Vedic recitations', 'is friendly to all elephants', and is

19. See E.R. Leach, *Aspects of Caste in South India, Ceylon and North-West Pakistan* (London: Cambridge University Press, 1971), pp. 2–3; and G.S. Ghurye, *Caste and Race in India* (Mumbai: Popular Prakashan, 2008), p. 46.

20. Ambedkar, *Annihilation of Caste*, p. 234.

21. When I am writing about caste, I am referring to the idea of the '*jati*' and not *varna*. There could thus be many *jatis* within each *varna*, which are ranked hierarchically in reference to each other, and also vis-à-vis other *jatis* in other *varnas*. For more on the differences between *jati* and *varna*, see Dipankar Gupta, 'Hierarchy and Difference: An Introduction', in Dipankar Gupta (ed.), *Social Stratification* (New Delhi: Oxford University Press, 1996), pp. 1–21.

22. For a detailed analysis of this idea, see Shivani Kapoor, 'The Violence of Odors: Sensory Politics of Caste in a Leather Tannery', in *The Senses and Society*, Vol. 16, no. 2 (2021), pp. 164–76.

23. Sunder Sarukai and Gopal Guru, *The Cracked Mirror: An Indian Debate on Experience and Theory* (Delhi: Oxford University Press, 2012), p. 164.

24. James McHugh, *Sandalwood and Carrion: Smell in Indian Religion and Culture* (New York: Oxford University Press, 2012), p. 6.

25. *Ibid.*

‘peaceful, fond of bathing, with a virtuous mind’.²⁶ The Kshatriya elephant ‘smells as sandalwood, ghee’, is ‘fearless in battle’ and wields weapons heroically.²⁷ The Vaisya elephant smells of ‘rice, sesame’, ‘*malati* jasmine’, is an ‘eater of butchered meat, and fond of kind words’.²⁸ The Sudra elephant is ‘thrilled by left-overs, with a smell that is sour, acidic, or of a he-goat, bones or crab’, and is ‘angry, corruptible, miserable, ungrateful’.²⁹

Odours are often thought of as an ephemeral and transient sensory phenomenon that may or may not leave many traces behind. It is thus difficult to write about odours and to attribute materiality to what is being written about odours. However, while odours by themselves may not appear to be tangible, they nonetheless reveal some of the material qualities of their sources. They also, and this is crucial to the argument here, affect the material states of those who smell them. In narratives such as the *Matangalila*, these smells—entangled with the sensation of taste—do not remain mere physical sense perceptions. In fact, once they are layered with value and character attributes, they become intensely material and political phenomena. In a similar fashion, Chaman Lal’s red-stained hands become an important marker for his sensory status. It is especially important that his hands do not simply smell of leather, but that the red stain on his hands indicates his malodorous state, perhaps even to those who cannot smell him. In this sense, the odour and the visual mark of leather announce and reiterate one’s caste to not just outsiders or others, but also to oneself.³⁰ Bruce Curtis, examining the role of odours in the determination of dietetics and habitus, argues that ‘the odour of things expressed the order of things’.³¹ In caste societies, smells then have the potential to reveal the hierarchical ordering of caste and further presage the process of discrimination and exclusion, as is evident from Chaman Lal’s predicament at having stained, malodorous hands.

The predicament of being polluted by the odours and touch of leather is also evident in the experience of upper-caste workers in the leather industry. Sanjay Chaturvedi, a Brahman by caste, works as a tannery manager in Unnao. Chaturvedi came to the tanning industry through a BTech in Leather Engineering, and in this sense is a contemporary inheritor of the position of the leather expert occupied by the likes of Guthrie and Das in the early twentieth century.³² Chaturvedi’s job entails the supervision and management of the process of tanning, from the selection of hides to the creation of wet-blue leather. His specialisation lies in regulating the chemistry of the chrome-tanning process, which sees him work in close collaboration with the wet section workers. It is crucial to point out here that Chaturvedi’s profession does not require him to do the tanning himself; instead, he is responsible for the scientific management of the

26. *Ibid.*, p. 84.

27. *Ibid.*

28. *Ibid.*

29. *Ibid.*, pp. 82–5.

30. Joel Lee’s account of smell-mapping across a village near Lucknow reveals how his Dalit respondents would find their way in the dark by following the distinct smells of the various ‘subordinate caste and untouchable *tolas*’: see Joel Lee, ‘Odor and Order: How Caste Is Inscribed in Space and Sensoria’, in *Comparative Studies of South Asia, Africa and the Middle East*, Vol. 37, no. 3 (2017), pp. 470–90 [471].

31. Bruce Curtis, ‘“I Can Tell by the Way You Smell”: Dietetics, Smell, Social Theory’, in *The Senses and Society*, Vol. 3, no. 1 (2008), pp. 5–22 [19].

32. There has been a shift in the qualifications expected of the leather expert from chemistry in the colonial period to engineering in the present. This shift has to do with the continued process of scientisation of the leather industry.

tanning process and of the workers. The division of labour between regulation and management on the one hand and physical labour on the other is not only a derivation of traditional caste norms, but also a contemporary caste practice that has remained unchanged through the formalisation of leatherwork through science and technology. In 1907, L.M. Jacob, a colonial administrator in the Department of Education, wrote to the Government of the United Provinces:

It is very rare to find good engineers among the natives of India. Their memories are so marvellous that they will master the text-books for purposes of examinations but in practice they fail because they leave many duties to the artificer of the country as derogatory to their dignity.³³

The colonial state's struggle with caste as it instituted a scientific regime of industrial work is quite evident from Jacob's rendering of the problem of 'dignity'. In an effort to retain their 'upper-caste' status—coded here in terms of 'dignity'—caste elites have often changed how knowledge systems were originally intended to function.³⁴

However, within leather manufacturing, these devices aimed at creating distance and encoding caste often fail due to sensory affects, such as the odours of leather. Chaturvedi's trouble with his profession, he reported in a conversation in his office at the tannery in 2014, started during the BTech coursework: 'I am a Brahman and thus the proximity to hides and dead animal bodies is against my religious beliefs', he emphasised. 'I do not eat meat, and my religion teaches me to worship the cow, not convert its body into leather', he continued in an agitated fashion.³⁵ I asked Chaturvedi why he chose a profession that went against his belief system. Rather reluctantly, he revealed that due to a lower rank in the entrance examination, he only qualified for leather engineering. The pressure to get into an engineering programme led Chaturvedi to make this choice. However, he now finds it untenable: 'The smell of my work travels back home with me, and my wife and mother often refuse to have any contact with me until I have had a bath and prayed at the home shrine'. Even then, he continued, 'many relatives and acquaintances keep asking my mother why the son of a Brahman is in this profession'.

Chaturvedi's entry into leatherwork is neither an incidental event nor a personal choice. Colonial educational and industrial policy, as indicated by A.N. Sen and R.J. Weston in 1929, was meant to facilitate the entry of 'young men' with the '[k]nowledge of chemistry, physics, bacteriology and mechanical engineering' into these industries.³⁶ They go on to reiterate that 'nobody need be ashamed to pursue the tanning profession on modern lines'.³⁷ In leatherwork, however, the introduction of scientific method through technical education evidently failed to take the stigma of caste out of the odours of leather. While Chaman Lal claims some space for dignity in his work with chrome-tanned leather and its

33. 'Industrial Development and Technical Education in the United Provinces', 7 September 1907, NAI, Home 785.

34. For more on this, see Renny Thomas, 'Brahmins as Scientists and Science as Brahmins' Calling: Caste in an Indian Scientific Research Institute', in *Public Understanding of Science*, Vol. 29, no. 3 (2020), pp. 306–18; and Ajantha Subramanian, 'Making Merit: The Indian Institutes of Technology and the Social Life of Caste', in *Comparative Studies in Society and History*, Vol. 57, no. 2 (2015), pp. 291–322.

35. Conversation between author and Sanjay Chaturvedi, Unnao, October 2014. For more on the debates on cows and Hinduism, see Cassie Adcock and Radhika Govindrajana, 'Bovine Politics in South Asia: Rethinking Religion, Law and Ethics', in *South Asia: Journal of South Asian Studies*, Vol. 42, no. 6 (2019), pp. 1095–107.

36. A.N. Sen and R.J. Weston, quoted in Bhattacharya, 'Caste, Class and Stigmatised Work in Leather Production in India', p. 40.

37. *Ibid.*

altered sensorium, he still faces the stigma of caste through his identity as a Jatav and as a leatherworker. Chrome tanning or the scientific management of tanneries could not resignify the disgust caused by the odours of leather. Chaturvedi, who probably confronted the discrimination of caste most evidently through leatherwork, is bothered by these very odours. Furthermore, he also has to negotiate the ostensibly 'lower' position of having a less desirable engineering degree compared to other branches. The next sections will contextualise some of these experiences by examining how colonial science and technology interacted with caste and the affectual nature of leatherwork in India.

Colonialism and the sensory politics of caste

By the end of the nineteenth century, the colonial state was, as Nicholas Dirks has termed it, an 'ethnographic state'.³⁸ In its effort to know and categorise its subjects, the colonial state had embarked upon a massive project of recording, archiving and describing its lands and people. Dirks argues that 'anthropology supplanted history as the principle colonial modality of knowledge and rule'.³⁹ In the colonies, anthropology primarily came across as a visual exercise. Indian subjects were photographed, viewed, judged, drawn and even spoken of as 'naked savage natives'.⁴⁰ Seeing became a form of evidence in a knowledge system where meeting the 'other' was a 'discovery' rather than a 'contact or encounter'.⁴¹ In the European scientific understanding of the body in this period, skin was thought of as fragile and porous, affording little protection against diseases and miasmas. Touch was thus considered to be the most dangerous form of contact.⁴² The European body itself was also increasingly being understood in visual ways. With the widespread acceptance of Pasteur's germ theory, fears about invisible entities causing diseases had increased.⁴³ Advances in technologies of 'distance', such as the microscope, camera and phonograph, thus sought to create an ocular and audible version of knowledge, especially of the 'other' in the colonies.

David Howes thus claims that what got recorded and replicated as knowledge was a 'world devoid of scents, savours, temperatures, and textures'.⁴⁴ While Howes' claim may provide a larger conceptual framework in which to understand the ordering of senses in the empire, evidence from imperial writing in India suggests that the colonisers were experiencing India in a multisensory fashion.⁴⁵ Andrew J. Rotter, writing on the sensory experience of the British in India, borrows an account from Elizabeth Sneyd's 'Reminiscences of the Dreadful Mutiny in India in 1857'. Here, she recalls the

38. Nicholas B. Dirks, *Castes of Mind: Colonialism and the Making of Modern India* (New Delhi: Permanent Black, 2012), p. 43.

39. *Ibid.*

40. S.M. Stevens, 'New World Contacts and the Trope of the Naked Savage', in Elizabeth D. Harvey (ed.), *Sensible Flesh: On Touch in Early Modern Culture* (Philadelphia: Pennsylvania University Press), pp. 125–140 [125].

41. *Ibid.*

42. Margaret Healy, 'Anxious and Fatal Contacts: Taming the Contagious Touch', in Elizabeth D. Harvey (ed.), *Sensible Flesh: On Touch in Early Modern Culture* (Philadelphia: Pennsylvania University Press), pp. 22–38 [22].

43. Alain Corbin, *The Foul and the Fragrant: Odor and the French Social Imagination* (New York: Berg Publishers, 1986), p. 226.

44. David Howes, *Sensual Relations: Engaging the Senses in Culture and Social Theory* (Ann Arbor: University of Michigan Press, 2003), pp. 6–7.

45. See Andrew J. Rotter, *Empires of the Senses: Bodily Encounters in Imperial India and the Philippines* (New York: Oxford University Press, 2019); and E.M. Collingham, *Imperial Bodies: The Physical Experience of the Raj, c. 1800–1947* (Hoboken, NJ: Wiley, 2001).

experience of escaping Cawnpore on a boat during the Mutiny with ‘the intolerable smell arising from a quantity of half dried bullock hides and other merchandize being taken to Calcutta’.⁴⁶ Constance Classen *et al.* have thus perceptively argued that ‘the centre (the power elite) governs from a position of olfactory neutrality’.⁴⁷ This olfactory or even sensory neutrality was necessary for the coloniser to maintain the civilisational difference from the colonised. The British in India, while thinking of themselves as odourless, or at least as having an acceptable odour, were smelling, tasting and feeling the colony with great intensity. It was this intensity of sensation that formed a significant justification for colonial rule. Mark M. Smith has thus rightly argued that ‘the project of imperialism... could not be effected by sight alone. The entire human sensorium was engaged in the acts of making and accommodating and resisting empire’.⁴⁸ Colonial ethnographic descriptions of caste, especially of the lower-caste groups, is one place where this sensuousness is evident. Abbé Dubois, a Christian missionary priest, writes about the Pariahs of the Madras Presidency as follows:

What chiefly disgusts other natives is the revolting nature of the food which the Pariahs eat. Attracted by the smell, they will collect in crowds round any carrion and contend for the spoil with the dogs, jackals, crows and other carnivorous animals. They then divide the semi-putrid flesh and carry it away to their huts, where they devour it, often without rice or anything else to disguise the flavour.... There are few Pariah houses where one does not see festoons of these horrible fragments hanging up; and though the Pariahs themselves do not seem to be affected by the smell, travellers passing near their village quickly perceive it and can tell at once the caste of the people living there.⁴⁹

Descriptions such as these reveal that while the colonial ethnographer was employing a sense of distance from the native, it was impossible to close off their senses to the smells, sounds and tastes of the colony. In the context of slavery in North America, Smith argues that the non-visual perception of race became more important after the end of the regime of segregation and with the increasing intermixing of races, both socially and sexually. It had simply become impossible to solely rely on vision to determine race, and senses such as smell thus gained in importance.⁵⁰ Similarly, it is primarily because the visual identification of caste is difficult—if not impossible—to achieve by observing the physical body alone that sensory markers of caste have become more important. Caste, I thus argue, is a multisensorial ordering of spaces, bodies and objects. While caste predominantly takes the shape of an olfactory experience in odoriferous contexts such as leatherwork, the other senses work to amplify these odours. Chaman Lal’s red-stained hands, which give away his olfactory status, are a case in point.

The colonial state thus understood—or, rather, had itself experienced—the multisensory nature of caste in general and the odoriferous nature of leatherwork in particular. However, this knowledge somehow did not become a significant part of the colonial

46. Rotter, *Empires of the Senses*, p. 61.

47. Constance Classen *et al.*, *Aroma: The Cultural History of Smell* (New York: Routledge, 1994), p. 161.

48. Mark Smith, quoted in Rotter, *Empires of the Senses*, p. 1.

49. B.R. Ambedkar, in Valerian Rodrigues (ed.), *The Essential Writings of B.R. Ambedkar* (New Delhi: Oxford University Press, 2014), pp. 255–6.

50. Mark Smith, *How Race Is Made: Slavery, Segregation and the Senses* (Chapel Hill: University of North Carolina Press, 2008), pp. 5–6.

regime of science and technology, especially in contested contexts like leatherwork. But in spite of their absence from the archive, the odours of leather made their presence evident through the partial failure of the project of colonial science in leatherwork. The next section will examine this failure.

Caste, leather and the politics of colonial science

Creating the science of leather in England

From the mid eighteenth century in England, the discipline of chemistry underwent significant changes in structure and orientation. The efforts at standardising chemistry as a science during this period led to the emergence of the chemist as an important scientific and managerial figure, one who was to become crucial for the organisation of the modern leather industry in the coming century. Up until the 1740s, chemistry was not considered a science like physics and mathematics, but rather an art or craft.⁵¹ Chemical methods were understood as being too reliant on sensory perception and the body to gather inferences.⁵² Furthermore, as Lissa Roberts notes, since chemistry had not yet systematised its methods, chemists could not transfer their skills to others. This status of chemistry is similar to the way in which leatherwork continues to be perceived as a craft, rather than as a technical or scientific process, even after it was infused with science and ‘converted’ into an industry. This might have to do with how knowledge produced through the body and accessed via the senses was often characterised as ‘art’.⁵³

As a result, by the late 1740s, efforts were under way to turn chemistry into a science by introducing standardisation through method and language.⁵⁴ By the late eighteenth century, chemistry was being regarded as a ‘pure science’ that could provide ‘rules for technical practice’ and thus could be ‘applied’.⁵⁵ It was chemistry’s interesting position here, oscillating between pure and applied science, that paved the way for its collaboration with industry. By the early nineteenth century, chemists were being employed informally as consultants for industries such as alkalis, dyeing and printing.⁵⁶ This became a more standard practice by the end of the century, with ‘the codification of the methodology of chemical analysis and its incorporation into public curricula’.⁵⁷ In the period leading up to World War I, many of these chemists began taking up managerial roles.⁵⁸

Despite advances in chemistry and the field’s alliance with industry, by the middle of the nineteenth century, England was found to be severely lagging behind competitors such as Germany and the United States in promoting new research and

51. Lissa Roberts, ‘Filling the Space of Possibilities: Eighteenth-Century Chemistry’s Transition from Art to Science’, in *Science in Context*, Vol. 6, no. 2 (1993), pp. 511–53 [512].

52. *Ibid.*, p. 516.

53. Christy Spackman, ‘Perfumer, Chemist, Machine: Gas Chromatography and the Industrial Search to “Improve” Flavor’, in *The Senses and Society*, Vol. 13, no. 1 (2018), pp. 41–59 [44].

54. Roberts, ‘Filling the Space of Possibilities’, p. 516.

55. James Donnelly, ‘Consultants, Managers, Testing Slaves: Changing Roles for Chemists in the British Alkali Industry, 1850–1920’, in *Technology and Culture*, Vol. 35, no. 1 (Jan. 1994), pp. 100–28 [101].

56. *Ibid.*, p. 102.

57. *Ibid.*, p. 106.

58. James Donnelly, ‘Defining the Industrial Chemist in the United Kingdom, 1850–1921’, in *Journal of Social History*, Vol. 29, no. 4 (Summer 1996), pp. 779–96 [790].

implementing those advances across industries. This lack was quite evident in the declining productivity of the English leather industry. At the Centennial Exhibition in Chicago in 1876, it also became clear that the United States had made significant advances in the mechanisation of leather production, an area in which England remained far behind.⁵⁹ Germany and the United States' success in making lighter, cheaper and faster leather was attributed to the adoption of mineral tanning.⁶⁰ In 1850, F.L. Knapp, a German chemist, first demonstrated the successful use of mineral tanning.⁶¹ In 1884, Augustus Schulz patented the 'two-bath' chrome-tanning process in the United States and finally heralded the era of commercial chrome tanning, a practice adopted by most tanners, with the exception of the British.⁶²

Realising the importance of chemistry in leather production, the British administration undertook a series of measures to rectify their shortcomings. The first leather research centre in Britain was established in 1891 at Yorkshire College in Leeds. In 1897, H.R. Proctor, Gordon Parker and Alfred Seymour Jones together formed the International Association of Leather Trades Chemists and produced a journal, *Collegium*, whose main preoccupation was research on tannin analysis. In 1909, the Tanners' Federation appointed a trade chemist located into Liverpool to advise federation members, while the organ of the federation, *The Tanners' Yearbook*, provided British tanners with statistical and scientific information concerning the chemistry, technology and economy of modern leather manufacturing. The introduction of chemistry in the tanning process allowed for a greater degree of control and standardisation, leading to the large-scale commercialisation of leather. Chrome tanning was also thought of as requiring 'greater skill' compared to vegetable tanning.⁶³ Trained chemists were thus regarded as crucial to this enterprise, sidelining even the old tanners in England who were hitherto considered specialists in tanning.⁶⁴ It was these changes in leather manufacturing in England that were sought to be transferred to India, mainly via scientific education and the training of chemists.

The standardisation of chemistry also resulted in methods that began to mediate sensory perception with technology and rationality. As Roberts elucidates, '[i]n the "new" chemistry taste and smell virtually disappeared ... touch and hearing were likewise sidelined'.⁶⁵ It is not as if sensory perception was completely neglected, but, as Roberts perceptively argues, 'unmediated sense evidence played less and less of a public role in the scientific determination of knowledge'.⁶⁶ The standardisation of chemistry into a science, its calibration of the use of senses like vision over smell and taste, and

59. R.A. Church, 'The British Leather Industry and Foreign Competition, 1870–1914', in *The Economic History Review*, Vol. 24, no. 4 (1971), pp. 543–70 [561].

60. *Ibid.*, pp. 561–2.

61. While Knapp pioneered the process, it was only by 1877 that he was able to produce acceptable chrome-tanned leather. In 1880, the American chemist Christian Heinzerling patented a different mineral tanning process: Church, 'The British Leather Industry and Foreign Competition, 1870–1914', p. 561.

62. Church argues that this was largely due to the resistance of the old English gentlemanly tanners, who controlled the bulk of the trade, to adapt to new methods: Church, 'The British Leather Industry and Foreign Competition, 1870–1914', p. 564.

63. *Ibid.*, p. 562.

64. *Ibid.*, p. 564.

65. Lissa Roberts, 'The Death of the Sensuous Chemist: The "New" Chemistry and the Transformation of Sensuous Technology', in David Howes (ed.), *Empire of the Senses: The Sensual Culture Reader* (Oxford: Berg, 2005), pp. 106–27 [123].

66. Roberts, 'The Death of the Sensuous Chemist', p. 109.

the increasing role of science in determining public and industrial policy ultimately culminated in the objective of 'chemical control'⁶⁷ of the tannery by the chemist. This chemist was now tasked with the role of managing industrial and scientific output as well as the workers in the tannery. However, academic training as well as their standing in the social hierarchy isolated the chemist from the sensuousness of the world he was regulating. Christopher Otter argues that self-regulating technology has often been employed to construct the modern individual and society.⁶⁸ This technology, he argues, either serves to limit sensorial experiences or to simulate the visual and the ocular senses to regulate the public space.⁶⁹ In the case of leatherwork, I show how the odours of leather challenged the primarily visual role of the chemist in the supervision and management of the tannery.

Confronting the odours of leather in India

The formalisation of leatherwork in India happened around the middle of the nineteenth century and was due both to the increased presence of British armed forces after the Indian Rebellion of 1857 and to the increased demand for leather in the British Empire as a result of its wars and military campaigns. Ramnarayan Rawat argues that the association of Chamars with leatherwork led to the establishment of the leather industry in cities like Agra and Kanpur, which had large concentrations of Chamars.⁷⁰ The colonial leather industry, much like the organisation of labour under caste, was thus based on the captive labour provided by the Chamars, who faced substantial barriers in finding other forms of work. The formalisation of leatherwork in an industry created many layers of labour and identity around the Chamar leatherworker. These factories were mostly owned by upper-caste Hindu or Muslim families, who had displaced the former smaller leather manufacturing units and their Jatav owners.⁷¹ Due to their caste and class status, these upper-caste factory owners attracted social and financial capital that had previously been missing from an 'untouchable' craft, leading to the rapid commercialisation and expansion of the industry.⁷²

However, the colonial administration was quick to realise that the presence of skilled labour and capital was not sufficient for the industrial production to expand in a systematic manner. As in England, leatherwork in India began to be organised along scientific lines into a modern industry. The global shift to chrome tanning also necessitated the inclusion of trained chemists into the industry. By the beginning of the twentieth century, a three-tier structure of technical and scientific education had been put in place.⁷³ University science departments in the larger cities were supposed to

67. David Roth Singerman, 'The Limits of Chemical Control in the Caribbean Sugar Factory', in *Radical History Review*, Vol. 2017, no. 127 (2017), pp. 39–61 [47].

68. Christopher Otter, 'Cleansing and Clarifying: Technology and Perception in Nineteenth-Century London', in *Journal of British Studies*, Vol. 43, no. 1 (2004), pp. 40–64.

69. *Ibid.*

70. Ramnarayan Rawat, *Reconsidering Untouchability: Chamars and Dalit History in North India* (Bloomington: Indiana University Press, 2011), pp. 109–16.

71. Lynch, *The Politics of Untouchability*, p. 37.

72. *Ibid.*, pp. 35–9.

73. For the details of how this system was set up and the colonial debates involved in the process, see Shivani Kapoor, 'The Search for "Tanner's Blood": Caste and Technical Education in Colonial Uttar Pradesh', in *Review of Development and Change*, Vol. 23, no. 2 (2018), pp. 118–38.

provide an education in the pure sciences. Graduates from these universities, like Das, would pursue scientific careers, either through industrial training or through research. In order to incorporate pure sciences into the industry, the British government started the State Technical Scholarship (STS) scheme in 1901. Under the STS scheme, English-speaking Indian science graduates were trained in technical and industrial subjects like leather chemistry in universities in England. On their return, they were contract-bound to find employment in Indian industries and assist in boosting their productivity through their technical knowledge.⁷⁴ These processes led to the creation of the leather expert or the chemist in the tannery, suited for Indian conditions. As Bhattacharya has pointed out, all technical scholarship holders from India belonged to the upper-caste and -class groups, and from amongst Hindus and Muslims. This process and these candidates were thus 'deeply imbued with caste-based notions of stigma and work'.⁷⁵

The chemist alone could not have run the tannery. The industry also needed the trained and scientifically-educated workers who could handle the chemicals and the machinery. The 'fitter who will know with understanding what the factory *mistri* now knows empirically' was to be trained in colleges like the Thomason College at Roorkee and the Cawnpore Technological Institute⁷⁶—institutions that were tasked to produce 'educated classes to be managers, overseers, foremen and investigators' who were to assist the chemists.⁷⁷ In the post-colonial period, it was this rung of technical education that was transformed into engineering programmes such as the one attended by Chaturvedi. Because of the requirements of such courses, most of the students here were from the upper castes and classes during both the colonial and post-colonial periods. It was primarily these trained personnel who had to be on the tannery floor in close contact with animal bodies and chemicals, as opposed to the leather chemist, who entered the tannery floor as an 'outsider'.⁷⁸

The colonial administration eventually also felt the need to train the tannery workers, especially in chrome tanning. Industrial and night schools were opened in towns like Kanpur and Agra to instruct workers in basic technical training as well as a little English and arithmetic.⁷⁹ It is generally understood that the training of workers was a difficult exercise for the colonial state. The workers were either unwilling or unable to come to these schools, and when they did attend, they were more inclined to work in their native fashion rather than be trained in new skills. However, as Bhattacharya has shown in her work, evidence also exists to show that in some cases, the workers were quick and adept at learning chrome tanning. Bhattacharya quotes from B.M. Das' deposition before the Indian Industrial Commission in 1916:

[The] Chamars [drawn in as workers in the leather tanneries and factories in Calcutta] are hard-working, regular and intelligent.... In our chrome tannery the Chamars who, previous to their coming to us were only accustomed to bark tanning and had no idea of machine work, quickly adapted themselves to the processes involved in chrome tannage.⁸⁰

74. 'Industrial Development and Technical Education in the United Provinces', April 1908, Home, NAI, 785.

75. Bhattacharya, 'Transforming Skin, Changing Caste', p. 325.

76. Letter from A.W. Pim, Secretary to Government of United Provinces, 29 August 1914, Education, NAI, 785.

77. 'Industrial Development and Technical Education in the United Provinces', April 1908, Home, NAI.

78. Bhattacharya, 'Caste, Class and Stigmatised Work in Leather Production in India', p. 44.

79. Letter from F.E. Taylor, secretary to Government, United Provinces to secretary to Government of India, Home Department, 7 September 1907, Home, NAI.

80. Bhattacharya, 'Transforming Skin, Changing Caste', p. 327.

It is important to note, however, that the Chamar leatherworkers in Das' testimony were still not considered to be the experts in the process—this label still lay with the chemist. In fact, Das is rather surprised at their ability to learn chrome tanning. The scheme of scientific and technical education thus reiterated the caste-based division of labour between the chemist, the manager and the worker. This was also, I argue, an attempted division of the sensory perception based on caste status.

Leatherwork presented very specific olfactory challenges to modern science. In the colonial archives on technical education in general, and on the STS in particular, there is a constant repetition of one complaint by the colonial authorities. We have already discussed Jacob's letter, in which he complained that good Indian engineers were rare because they consider 'practical work' to be beneath their dignity. The report of the Industrial Conference held at Nainital in 1907 posed the question of how to 'predispose boys to industrial work, or break down prejudice ... against manual labour'.⁸¹ It was proposed that 'some system of manual training should be introduced into the general school course with the object of educating both the eye and the hand'.⁸² Writing on the crisis in the STS around 1920, when tanneries in England refused to take Indian students as trainees, Bhattacharya cites the testimony of Dr. Parker, the principal of the Leathersellers' College in London: 'the Indian Student is incapable, except in rare cases, of realising the necessity for the detail and exacting methods necessary for the production of leather on an extensive scale'; and, 'educated Indians are more in the habit of giving orders to servants to do the work and not seeing it done, which is an essential feature in British productions'.⁸³

Lastly, a review of the STS scheme in 1913 observed that there were two types of men who applied for scholarships in tanning. The first such type was an M.A.R. Pannikar, from a Nair family of good 'social position' in Madras and who reportedly had a 'brilliant career as a chemist at Leeds University': 'a thinking mind' who 'carried out some most excellent research work'.⁸⁴ The second type was an unnamed 'Government scholar who belonged to a family of hereditary tanners', who had little scientific education, but 'an instinctive knowledge of leather': Parker specifically stated that he had 'tanner's blood in him'.⁸⁵ When asked to choose between Pannikar and the unnamed man, Parker opted to 'back the tanner'.⁸⁶

Terms like 'dignity', 'manual labour', 'servants', 'social position' and 'hereditary' have often been employed to 'transcode' caste and to talk about it by other means.⁸⁷ The absence of the mention of caste in the archives on technical education, especially in leatherwork, is an important silence. The colonial state was certainly aware of the ways in which caste operates in Indian society. Along with caste, the odours of

81. 'Industrial Development and Technical Education in the United Provinces', April 1908, NAI, Home, 785.

82. *Ibid.*

83. Bhattacharya, 'Transforming Skin, Changing Caste', p. 325.

84. 'Report of a Committee Appointed by the Secretary of State for India to Inquire into the System of State Technical Scholarships Established by the Government of India in 1904', 1913, Industries, 322, Uttar Pradesh State Archives, Lucknow.

85. *Ibid.*

86. *Ibid.*

87. M.S.S. Pandian, 'One Step outside Modernity: Caste, Identity Politics and Public Sphere', in *Economic & Political Weekly*, Vol. 37, no. 18 (4–10 May 2002), pp. 1735–41 [1735].

leatherwork are also absent from these archives.⁸⁸ The exceptional reference to 'tanner's blood' is a rare occasion of some affect here. But more importantly, this makes it clear that the colonial authorities did recognise that training in leatherwork should be organised along caste lines, albeit without mentioning caste itself. We have seen in the earlier sections that odours and other sensations were discussed in great detail in colonial ethnographic descriptions. The disgust produced by the odours of leatherwork also forms an important part of the contemporary ethnography of the leather industry, as my work shows. What, then, explains the absence of discussions around caste and the odours of leatherwork in this particular colonial archive, especially when the colonial state seems to be grappling with the question of the reluctance of upper-caste Indian students to do 'practical work'?

The transfer of colonial science to India, along with its circulation and reception in the colony, was a complex process. This transfer entailed, as Gyan Prakash has argued, 'trafficking between the alien and the indigenous, forcing negotiations between modernity and tradition and rearranging power relations between the colonizer and the colonized'.⁸⁹ In India, caste elites who wanted to participate in this transfer in order to become part of the modern regime of science and industry actually only accepted a part of this modernity, rejecting the rest in favour of caste privilege. For the Chamar workers, while this transfer resulted in some isolated gains in social and class position, colonial science still did not alter the very basis of their oppression. In fact, the social and economic gain came in exchange for continuing in their caste-ascribed occupation, facilitated by the colonial state 'backing the tanner'. In leatherwork, caste and colonial science thus simultaneously constituted a zone of conflict and contact for all its participants.⁹⁰

Furthermore, colonial science did not only arise in the context of the social forms of organisation engendered by colonialism;⁹¹ British scientific knowledge also came to India with its own history. Industrial chemistry, as defined in England, thus became synonymous with vision as an organising principal. This education of the 'eye' over the 'hand' suited both the elite castes and the knowledge system of chemistry. By not acknowledging the disgust associated with leatherwork, colonial science also failed to acknowledge caste. In fact, science reiterated caste by replicating not just the caste-based binary between mental and manual labour, but also by maintaining 'olfactory neutrality'. However, because it is difficult to control odours, the stink of leatherwork escaped tanneries and the archives and marked the bodies of all those who worked there, irrespective of caste status.

88. I refer only to the limited archives I have seen myself or read about in the works of other scholars. Reference to the odours of animal bodies and leatherwork are certainly present in archives relating to slaughterhouses, location of tanneries and bone mills in cities and documents around the public sale and consumption of meat.

89. Gyan Prakash, *Another Reason: Science and the Imagination of Modern India* (Princeton, NJ: Princeton University Press, 1999), p. 6.

90. I borrow this idea from Projit Bihari Mukharji, 'Parachemistries: Colonial Chemopolitics in a Zone of Contest', in *History of Science*, Vol. 54, no. 4 (2016), pp. 362–82.

91. Dhruv Raina, 'Reconfiguring the Centre: The Structure of Scientific Exchanges between Colonial India and Europe', in *Minerva*, Vol. 34, no. 2 (1996), pp. 161–76 [163].

Conclusion

Caste norms and practices are one way in which to understand and contextualise the sensory politics of space, bodies and objects. These narratives are complicated by interrogating the impact that the colonial interventions had on shaping these processes. In the leather industry, colonial intervention was not a project of modernity that created deodorised bodies and environments, as Howes claims.⁹² Rather, science and technology were skilfully used to obfuscate caste and untouchability, effectively rendering them illegible and invisible when the need arose. With the organisation of knowledge production and labour as two distinct caste and sensory activities, caste was thus allowed to stay, adapt and constitute itself into the ostensibly modern regimes of science and industry.

The colonial and the caste regime sought to contain the odours and the disgust of leatherwork in the body of the 'untouchable' worker. Through the encoding of caste as 'hereditary skill' and further as a matter of 'blood', the colonial state made caste a part of colonial modernity. However, the profitability of leather as an object forced the empire to convert an untouchable object into a desirable commodity. The chemist-manager and the upper-caste owners were therefore supposed to project that desire onto leather—to present it as an unpolluted object that had social capital. These figures were also supposed to be insulated from the pollution of leatherwork by their very immersion in science, technology and ritual status. However, the colonial state failed in the containment of this pollution—precisely because leatherwork smelled bad.

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92. David Howes, 'HYPERESTHESIA, or, The Sensual Logic of Late Capitalism', in David Howes (ed.), *Empire of the Senses: The Sensual Culture Reader* (Oxford: Berg, 2005), pp. 281–303.