

SNAKES, SNAKEBITES AND BRITISH MEDICAL-ZOOLOGICAL ENGAGEMENT IN EARLY COLONIAL INDIA: HEALTH, MEDICINE AND IDEOLOGY*

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ABSTRACT

This paper tries to trace the interesting history of Western medical-zoological engagement with venomous Indian snakes within the context of making and consolidation of British health policy in colonial India during the late eighteenth to the mid nineteenth centuries. It shows that while the British colonisers began to exploit flora and fauna of the newly subjugated land for their material benefit, they confronted wild Indian creatures like venomous snakes and anxiously noticed the huge mortality from snake poisoning in India. This threw a direct challenge to the healthy livelihood of the colonisers because of their insufficient knowledge about such a variety of snakes and their envenoming powers. The paper shows how Indian snakes formed a significant part of the British medical-zoological imagination of Oriental/tropical wilderness; a cruel, chaotic and disease-laden condition posing a threat to the life and health of the Europeans and also how the difficulties faced in snake-ridden India were engaged with the idea that India was essentially different from Europe: environmentally and medically. This paper concludes that Western medical engagement with venomous snakes and the consequential health measures which flourished under the British agency provided the tools to order and control the snake-ridden landscape of India and paved the way for the assertion of an intellectual superiority over the colonised people. In this regard, Western medicine and health policy, not only as practice but also as ideology, served to justify the colonial rule and became a true instrument of the British Indian Empire.

Keywords: *Snake Poisoning, Wild Orient/Tropics, British Health Policy, Colonial/Tropical Medicine, British India.*

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INTRODUCTION

In the past four decades there have been a lot of excellent researches and writings on the history of biomedicine in European colonial territories during the eighteenth and nineteenth centuries. Particularly, the history of Western medicine in British India is increasingly attracting the attention of scholars from a range of disciplinary locations, leading to the emergence of varied themes and perspectives (Arnold 1993; Bala 1991; Harrison 1994; Kumar 1998; Kumar 2001, 123–275; Kumar and Basu 2013; Palit and Dutta 2005; Pati and Harrison 2006, 2009; Sharma 2012). Much of these scholarly exercises have meticulously studied the neglected features of the social history of health and medicine in British India emphasising the symbiotic relationship between Western medical science and colonial exploitation and dominance. They have shown that, as the ‘tools’ of imperialism Western medicine was mainly used to protect the European traders, soldiers and officers from the hostile and disease-laden colonised landscapes and thus largely helped in the extension and consolidation of colonial rule in India.² Researches in the socio-cultural history of tropical disease and medicine have also focused on the ways in which tropical India, in the light of climatic theories of maladies, was imagined as a land of dirt, disease and sudden death, though, not perhaps quite as a ‘white man’s grave’ like the west coast of Africa, but as fundamentally unhealthy and deadly for ‘white’ bodies (Arnold 1996b, 2005; Chakrabarti 2012; Curtin 1989; Harrison 1999).

A number of works, with reasonable clarity, have accepted the idea that colonial/tropical medicine was, actually, an integral part of the colonial governance. As a hallmark of the European racial pride and cultural superiority, modern biomedicine underpinned imperialism in India not only by reducing the mortality and morbidity of the colonisers and their ‘native’ collaborators, but also by socially and culturally controlling the bodies and minds of the colonised people, in order to mould their ideas, belief and desires to the best advantage of the Europeans. Needless to say, these recent studies have done much to construct a usable history of health and medicine in modern India. But, they have hardly engaged themselves in the history of snakebite morbidity and mortality or the extensive medical-zoological research on snake venom, that was undertaken during the years of British rule in India—a lacuna that this paper somehow attempts to fill-up.³

Drawing on the burgeoning field of scholarship, the present paper is an attempt to understand the medical history of British India through the prism of snake and its venom. More precisely, this work considers the particular case of

² For the pioneering work on the role of Western medicine as ‘tools of empire’, see Headrick 1981, 58–79.

³ In recent years, however, a growing interest in the history of colonial medical engagement with Indian snakes and their venoms is being noticed. See, for example, Bhaumik, 2012; Chakrabarti 2012, 86–178.

British engagement with the ‘terror’ of venomous Indian snakes and the colonial medical management of the ‘evil’ of snakebite deaths in India during the late eighteenth to the mid nineteenth centuries.⁴ Focusing on this particular health issue, to which medical historians have paid little attention, this paper shows that medical-zoological engagement with snake varieties and snake venoms did indeed aid the British colonisers’ effort to sustain and strengthen their domination over India by reducing the risk of mortality involved in the colonial project and most significantly, by providing the image of the social and cultural malignancy of the indigenous people of a snake-infested country they gradually conquered and ruled. Indeed, this paper seeks to demonstrate the way in which the Europeans’ study of snake and venom in India and their medical search for the remedy of envenomation enormously helped the colonisers to create a dichotomy between Europe and its ‘Others’,⁵ in order to assert European racial and cultural superiority over the indigenous Others and in the process, extend and maintain European hegemony over the ‘wild’ and ‘dangerous’ Oriental/tropical landscape inhabited by the ‘disorderly’ and ‘inferior’ Others.

Against this backdrop, this paper is specifically interested to provide a critic of British construction of the medico-geographic categories like ‘tropics’, ‘tropical disease’ and ‘tropical wilderness’. The relationship between ‘tropical medicine’ and colonial politics of difference is particularly germane to our study. After all, the gamut of medical-zoological study of the snakes in India fashioned a significant part of the construction of an essential difference for ‘warm’ or ‘hot’ climates (as distinct from the temperateness of Europe); tropical medicine was about addressing this essential difference. It is true that tropical medicine, as a speciality within colonial medicine and as a prominent colonising force, did not emerge before the 1890s (see Worboys 1976, 1988 and 1993). But as persuasively argued by David Arnold (1996, 5) and Mark Harrison (1992, 299-300), we are probably justified in using the notion of tropical medicine in relation to the colonial medical engagement with snake venom pertaining to earlier period of the late eighteenth to the early nineteenth centuries.

However, this paper shows that, as in the case of all other specialisations under tropical medicine, the medical study of snake envenomation in India had two layers of hegemonic signification. At one level, it was an indication of the self-conscious claim of the colonial medical establishment, as projected in their healthcare strategy, that it could somehow manage the problem of snakebite-induced mortality. At another level, it served as an ideological weapon to demonstrate the superiority of the West over the tropics. It enhanced the colonisers’ status as a modern race that only could produce ‘scientific’ knowledge about the aetiology of the disease of snake envenomation specific to the tropical

⁴ For the British idea that venomous Indian snakes are ‘terror’ or ‘evil’ because of the horror they spread and the lethal harm they caused see, Fayrer 1878.

⁵ On the European construction of the ‘Other’, see Said 2001.

climate. This paper shows that the implicit deployment of the notion of the tropics in relation to snake poisoning and healthy living in colonial India also privileged the concerned medical practitioners to take a ‘civilising’ role and enhanced their status as knowledgeable persons among a supposedly unenlightened indigenous population.

ENCOUNTER WITH VENOMOUS INDIAN SNAKES

By the end of the eighteenth century, the English East India Company (hereafter EEIC) became an ad hoc colonial power on the Indian subcontinent. From the 1750’s successive British military victories over the ‘native’ rulers and other European competitors enabled the Company to incorporate more territories under its influence. While the Britons started to explore their newly conquered terrain, they were amazed to see the numerous varieties of Indian flora and fauna. The European merchant-rulers were excited about the opportunity that the vast natural kingdom of India offered in natural history studies. They became keen to identify commodities that could be profitably exported to their homeland and in the process started cultivating commercial plants and found botanical substitutes for drugs and simples. While the British successfully began to exploit plants and herbs of India for their material benefit, ‘wild’ Indian creatures like venomous snakes virtually became an anathema to the emerging British ascendancy in the subcontinent. What they anxiously noticed was the huge mortality from snake envenomation in India.⁶ The presence of numerous species of snakes in India, many of which are ‘dangerously’ venomous, threw direct challenge to the everyday livelihood of the colonisers. The hopeless situation became all the more critical because of the colonisers’ insufficient knowledge about such a variety of snakes and their envenoming powers as their exposure to lethal snakebite was rare in their homeland (in this case in Britain).⁷ Therefore, the Western medical-zoological knowledge that the colonisers borrowed from their homeland could not effectively help them to manage venomous snakes and snakebite mortality in India—a very vital requirement for the imperial expansion and establishment in the subcontinent.

In this scenario, the initial reaction of the colonisers towards snake envenomation seems to be ophidiophobic. For example, William Mackenzie, a physician from Madras Presidency, wrote in an article published in the Asiatic Society’s periodical in 1820:

⁶ For example, Joseph Fayrer of the Indian Medical Service in a report to the *Nature* quantified snakebite deaths across seven administrative regions representing about half of British India and found that 11,416 people had died of snake poisoning in 1869. See Fayrer 1882, 206.

⁷ Recorded incidental deaths from the bite of Adder (*Vipera berus*), the only naturally occurring venomous snake in Britain, were very few in numbers in comparison with that in India. Statistics partially shows that only fourteen deaths occurred in Britain during the hundred years from 1876 to 1975. See, Reid 1976, 154. Whereas, every year over 15,000 people reportedly die due to snake poisoning in India. See, Swaroop and Grab 1954, 57–58; Warrell 2005, 10.

Soon after the opening of the bar in the month of October 1815, reports were circulated at *Madras*, that a great shoal of sea snakes had entered the river, and that many natives in crossing it had been bitten and had died. These reports caused so serious an alarm among the natives, that they attracted the attention of the superintendent of the police, who on enquiry ascertained that three individuals after crossing the river *had died*, and their death had been occasioned (as was universally believed) by these snakes. In consequence of this information, a reward was offered for each sea snake caught on the condition of being carried to the police office (Mackenzie 1820, 329).

What strikes the reader most is the panicky reaction of the colonisers to the snakebite deaths. Though the above author noted only three deaths induced by snakebites during the concerned period, the local Superintendent of Police became so anxious that he immediately declared a reward for each sea snake brought to the police station. Such a prompt action indicates that, far from being taken lightly, the incidence of three snakebite deaths was indeed taken as a challenge to the emerging edifice of colonial rule. Similarly, the author's reaction to the presence of 'great shoal of sea snakes' causing 'serious alarm' reflects an obsession with the fear of snakes and their venomous bites shared by the officials of the EEIC.

True that the British sought to make the 'European Town' or the 'White Town' as clean as possible relative to the 'Black Town,' the habitat of the Indians⁸ and thus minimise the possibility of vipers besieging the 'white' home. Yet, on several occasions, the Europeans were about to receive their death-wounds from mischievous snakebites. For example, Reginald Heber who reached India in 1823 and served as the Bishop of Calcutta, in his famous travel diary, recounted on 18 September 1824 a thrilling story he had heard of an English woman at Patna who once spent a whole night with a venomous Indian cobra under her pillow. In the morning when the lady suddenly snatched her pillow away she spotted the most dreaded reptile in India coiled up within two inches of her neck. After describing the episode, Heber sarcastically remarks: 'The snake was without malice, his hood was uninflated, and he was merely enjoying the warmth of his nest; but, alas! for her, if she had during the night pressed him a little too roughly!' (Heber 1829, 280). There are several similar stories like the tale of Lieutenant Colonel Edward James Corbett, more familiar as Jim Corbett, who was once trapped in a small dark bathroom of his Mokameh Ghat residence with 'one of the most deadly snakes in India', a 'wicked-looking' big cobra, and successfully rescued himself from the 'horror' situation (Corbett 1968, 185-187). However, European residents surely could not always get such a narrow escape from the bites of venomous snakes and sometimes became victims to snakebites. As for example, in the year 1809, Civil

⁸ Actually in colonial India European town planning and building style took on a racial form, with sincere attempts to protect Europeans—civilians and military—from the numerous 'native diseases'. See, Jeffery 1988, 96-97; Metcalf and Metcalf 2008, 108-111; Metcalf 1998, 177-179.

Surgeon of Chittagong, John Macrae was bitten by a snake on his right leg at night, while he was walking on the southern veranda of his house. In depicting this evil fortuity, Macrae wrote in the *Asiatick Researches*:

On the night of the 12th of May, on stepping into the southern verandah of my house, I observed a small snake, of a dark colour, running along the terrace; and which, after several unsuccessful attempts, I at length hit and killed, with a small cane I had in my hand. Immediately thereafter, as I walked, I felt a slight uneasiness below the inner ankle of my right leg, as if I had taken off a bit of the skin, and this, I imagined, I had done, with the heel of the other foot, in my eagerness to kill the snake; and therefore, after gently rubbing the part with my hand, I thought no more of it; but in a few minutes, returned into the house, and began to undress to go to bed...The uneasiness at my ankle still continued as before, without appearing to increase, and I recollected, that while endeavouring to kill the snake, it had once made a dart towards me, and got between my feet, but as I did not perceive it to touch me, I was unwilling to ascribe to so alarming a cause, the unusual sensations I felt; yet I could not otherwise account for them (Macrae 1810, 310–311).

Thus, the colonisers in India were not feeling safe in their own houses, despite their 'better' health and sanitary strategies and policies. Fortunately in the first two cases the British residents were not bitten by the dreadful cobras and in the last case the snake was too 'small' to be poisonous enough to kill an adult, but usually death was a common occurrence and the colonisers, as their writings show, became very much anxious about it.

INVENTING TROPICALITY AND CREATING DIFFERENCE

As evident, in this scenario, a sense of fear and anxiety for the possibility of being confronted with venomous snakes and bitten by them somehow came to persist among the colonisers, which was frequently projected in a range of colonial literature concerning Oriental jungle and lifestyle. For example, the Europeans' enduring obsession with the idea of venomous Indian snake in tropical jungle, stirred up Rudyard Kipling in 1894 to inimitably portrait this reptile as an attractive but mysterious and deadly creature:

From the thick grass at the foot of the bush there came a low hiss—a horrid cold sound...Then inch by inch out of the grass rose up the head and spread hood of Nag, the big black cobra, and he was five feet long from tongue to tail. When he had lifted one-third of himself clear of the ground, he stayed balancing to and fro exactly as a dandelion-tuft balances in the wind, and he looked...with the wicked snake's eyes that never change their expression, whatever the snake may be thinking of (Kipling 2015, 137–138).

Thus, with a strange manner of livelihood and behaviour, quick yet mysterious sinuous motion, the cold fixity of gaze, unpredictable appearance from the void without any noise, the snake perfectly appeared in British imagination as a sign of wild and perilous Indian landscape. India appeared as an alien snake-infested territory, where the threat of snakebite made the colonisers feel as being utterly vulnerable to physical injury and consequential death as they were required to travel throughout this country. The anonymous author of the book titled *India: Illustrated*, pointed out that:

One of the greatest drawbacks to life in India is the great number of poisonous snakes that are found. They creep into the houses and even into the beds; they drop down from the thatched roofs; they lie coiled up in the roadways, and are everywhere. It seems almost incredible, but nearly forty thousand people die every year from their bites. From such a scourge there seems no way of escape (Anon. 1876, 60–64).

Thus, Indian snakes formed a significant part of the British medical-zoological imagination of Oriental/tropical wilderness—a cruel, chaotic and disease-laden condition posing a threat to the life and health of the Europeans.⁹ Noticeably, British imagination of the Orient and their romantic and commercial interest in tropical nature and fauna also induced them to a similar engagement with Indian mongrel dogs or as referred as ‘pariah’ dogs,¹⁰ carriers of rabies and another symbol of tropical wilderness to them and subject of colonial medical-zoological experimentations (Chakrabarti 2012, 91–94). These dogs were abundant in number and usually maintained by the Indian villagers, but to the colonisers, pariah dogs in the streets were again a grim reminder of the sylvan and savage tropics, exposing them to the danger of hydrophobia and sure deaths. Prejudiced by this growing anxiety for epidemic of rabies, the European soldiers and officers tried their best to censure the Indians for their ‘reluctance and inability to control the mongrels in their localities’ (Chakrabarti 2012, 93). Actually, the vast alien and untamed tract of wilderness in India obsessed the colonisers so much so that they imagined themselves as being hounded by several recalcitrant deadly creatures and their attitudes towards these wild animals somehow resembled their attitude towards ‘native’ Indians. It was in this context that, both Indian wildlife and social life became subjected to intense scrutiny and containment of these became almost a mission for the growing European interest in the colony.

Against this backdrop, the general attitude of the British colonial officials and medical practitioners towards venomous Indian snakes was to view them as ‘evil’

⁹ For the colonising discourse that constructed the tropical world as the West’s environmental Other, see, Arnold 1996b, 2005; Harrison 1999; Metcalf 1998, 171–185.

¹⁰ The term ‘pariah’ originally referred to a low-caste community of South India. It was used by the colonisers to condemn the mongrel street dogs of India as outcasts. Chakrabarti 2012, 92.

or source of ‘disorder’ and ‘it seems obvious that more effectual measures are needed to mitigate, if not prevent, this evil’ (Fayrer 1878, 2). So a strong sense of animosity towards Indian snakes gradually grew and substantially persisted among the colonisers. Interestingly, this attitude was quite unparalleled in the traditional Indian perception about snakes. Indigenous mode of living exposed Indians greatly to deadly envenomation. The majority among them preferred to travel in bare feet, sit on the floor and sleep on the ground, and readily became victims to snakebites, often incurable and destructive. Therefore, the loss of life from snake poisoning was frequent and huge in this country. But what is important to notice is that, although death from snakebite was treated as a tragic incident in indigenous families, this had never been translated into a phobia about snake. Rather, this frequent exposure to the possibility of snake envenomation generated various indigenous creative literatures like *Manasāmaṅgal Kāvya* in pre-colonial Bengal¹¹ and varied medical writings on snakebite, like the two key texts of Ayurvedic medicine, the *Caraka Saṁhitā* and the *Suśruta Saṁhitā*,¹² integrally informing veneration for snakes rather than any phobia. There are plenty of evidences which show that Indians had a normal relation with venomous snakes and by tradition they were snake-friendly. ‘A native gentleman’, Sir Madava Row, in one of his lectures clearly indicated how the common Indian subjects usually treated snakes with fellow-filling attitudes. He remarked: ‘Though people die from their venomous bites, serpents are worshipped as living deities by many of my fellow-countrymen. Respectable citizens deem it a duty to set apart a cool patch in their gardens for the comfortable residence of snakes’ (quoted in Pool 1894, 143). Similarly, in Bengali cultural belief and practice, a domestic sort of snake, called *vāstu sāp*, used to attract universal respect as they were believed to be the guardians of the dwelling houses. This particular species did not suffer any injury from anybody’s hands, even though they used to live within very easy reach of all and if accidentally killed by someone, was burned like a human being with all funeral rites and rituals (Bhattacharya 2006, 61–62). Thus, snakes, despite their power of deadly envenomation being known to the Indians, were never socially

¹¹ The famous Bengali epics in praise *Manasāmaṅgal Kāvya* glorifies the snake-goddess Manasā’s victory over those who refused to worship her. See Bhattacharya 1961; Bhattacharyya 1962; Biswas 2009; Sen 1953 and 1968. In accordance with the storyline, three major streams of the *Manasāmaṅgal* are identified by scholars, such as: the West Bengal Style, the North Bengal and Assam Style, and the East Bengal (now Bangladesh) Style. Local version of the similar tale is also available in Bihar, Orissa and South India. For a detail history, see Bhattacharyya 1970, 236–415; Dimock 1962; Dimock and Ramanujan 1964; Maity 1966; Smith 1980.

¹² The *Saṁhitās* provide an almost complete list of ophidians of different groups known till then as well as contain some details about zoological classification and identification of snakes, their anatomy and dentition, characteristic features of male and female species, types of bites and their symptoms and remedies. A close reading of these texts **clearly suggests** that indigenous practitioners meticulously studied snakes and their venoms and showed remarkable sagacity and prudence to maintain a good relationship with the snakes around them. See Bhishagratna 2012, 27–73; Mehta et al 1949, 2140–2203.

treated as exotic creatures. Moreover, these reptiles, particularly hooded cobra, were extremely popular reptiles of adoration all over India and being worshipped as source of happiness, wealth and fame.¹³ The Indians, over a period of time, tried to ward off the peril of snakebites and were eager to counteract their venom medically (see Slouber 2017, 1–132), but above evidences also indicate that any systematic and collective animosity towards snakes was not a common feature at all in traditional Indian lifestyle and customs.

In contrast, the British colonisers' attitude towards Indian snakes was essentially different in its nature and objectives, possibly because the scale and intensity of their intervention into Indian wild landscape were far more extensive and exploitative than those of their predecessors. Interestingly, the British were not the first group of Europeans to have a tryst with this Oriental/tropical wilderness. Indeed, during the sixteenth-seventeenth centuries, the Portuguese and the French were the first Europeans to have developed direct contact with snake-ridden India. Portuguese physician and naturalist Garcia da Orta (1913, 362–364) and French Huguenot Jean Baptiste Tavernier (1889, 152) took great interest on Indian snakes and indigenous medical methods of curing snakebite victims and were not known to have expressed any animosity towards these reptiles. These European sojourners also must have been afraid of being bitten by poisonous snakes during their travel in this country and therefore keen to collect information about indigenous medical treatment of snake poisoning. But their attitudes towards these reptiles did not greatly differ from that of the Indians already stated above. Quite the opposite, the British animosity towards Indian snakes came across particularly pronounced because they were the ones, who meticulously tried to transform non-productive space into a productive landscape in India, a tropical jungle into an empire's garden (see Drayton 2005; Sharma 2012). This brought the colonial regime in direct conflict with the wild animals as well as forest dwellers and *ādivāsīs* (see Chaudhuri and Bandopadhyay 2004; Pati 2011; Rangarajan and Sivaramakrishnan 2012). It was the British colonisers, who came to believe that the unfamiliar and deadly snake-ridden landscape should be tamed and controlled in order to ensure 'better' protection to the health and life of the European soldiers, officers and civilians, who were engaged to bring the barren land and forest under plough for more revenue to the colonial coffer. Undoubtedly, in this situation, the colonial medical-zoological enterprise of mapping of Indian snakes became the veritable of the inner project of scientific Orientalism, a project which was essentially aimed at exercising effective command over Indian wild landscapes. As usual, a strong Orientalist tendency to depict Indian climates and landscape as 'the Other' was found latent in this project which was both exploitative and hegemonic as it

¹³ Clearly, there is no place in this paper for extensive discussion on pre-colonial Indian religious and cultural beliefs and values associated with snakes. Even, the literature on snake worship in India is too large to permit comprehensive citation. Selective examples include Deoras 1978, 1-28; Oldham 1905; Rivett-Carnac 1879; Sinha 1979; Vogel 1926.

ultimately enabled the colonisers to assert European superiority over Oriental people and wild creatures.

It is in this context, the difficulties faced in snake-ridden India were engaged with the idea that India was essentially different from Europe: environmentally and medically. In order to interpret and manage Indian snakes and the consequence of their bites, the European medical practitioners constructed their own 'imaginative geography' (Said 2001, 49–73) and accordingly conceptualised snake envenomation as a disease of warm or hot climate. To claim an integral relation between warm climate and the degree of destructibility of this disease, colonial practitioners proclaimed that if the victim was situated in the tropics, the cure would be difficult, because 'the venom of snakes is more malignant during hot dry weather' (Williams 1790, 256). They argued that rapid progress of several symptoms of this 'disorder' peculiarly occurred in tropical environment. Elaborating further on the essential difference of the tropics they portrayed the Indian snakes as: 'much more numerous, and much more dangerous than in *Europe*' (Boag 1799, 103). For example, eminent Scottish physician Patrick Russell, who came to India in 1781 and as a 'naturalist and botanist' of the EEIC initiated the study of the 'natural history of snakes' (Bhaumik 2012), registered that the consequence of snakebite is very different in India from what it is in Europe. In his 1796 seminal book, entitled *An Account of Indian Serpents, Collected on the Coast of Coromandel*, he wrote:

It has been called in question, whether in Europe; the bite of the viper ever proved fatal to man...The case is widely different in respect to the poisons of the Cobra de Capello, and some other Indian serpents. That man is subjected to their deleterious power, is a fact confirmed every year by too many fatal accidents; and the experiments...put it beyond all doubt, that the stronger animals, who resist the poison of the viper, rapidly give up life, to the single bite of a Cobra de Capello (Russell 1796, 77).

This portrayal of difference between Indian and European worlds of snakes usually tied itself up very well with the Orientalist stereotype of projecting India as a dangerous landscape teeming with strange, unfamiliar animals. And as this 'constructed' wild nature continuously threatened European healthy living as well as their commercial investment, immediate taming of this wild landscape was felt essential for the day-to-day enterprise of expansion and consolidation of British dominions in India.

MEDICAL MANAGEMENT OF SNAKES AND THEIR VICTIMS

It became a crucial task for the colonisers to invent medical solution to this 'alarming' disease of snake poisoning if the British possession in India had to be made permanent. A systematic study of snakes of the terrain thus became a vital

necessity and the first tentative step towards this systematic medical management of snake venom in India, as stated earlier, was taken by an amateur Scottish physician Patrick Russell. He examined various Indian snakes, studied nature of their bites, character of venoms and differentiated between venomous and harmless species by their different dentitions (Bhaumik 2012). Several colonial scientific and medical institutes like, the Asiatic Society (1784), the Oriental Museum (1814), major ancillaries to the early colonial establishment, were quick to step in. As a pioneer agency, the Asiatic Society systematically recognised and scientifically constituted medical-zoological knowledge for understanding and regulating the problem of snake poisoning. The Society's periodical *Asiatick Researches* and its successor *The Journal of the Asiatic Society of Bengal* provided a forum for the communication of the results of medical-zoological observations, explorations and researches (Bhaumik 2011). Later the Presidency College (1817), the Calcutta Medical College (1835) and the Zoological Garden of Calcutta (1876) came forward to play crucial roles in the development of laboratory-based pharmacological research on snake venoms and their action on living animals. Thus, the colonisers began an assiduous medical-zoological study of the snakes and their venoms to identify the extent of danger from them and to find a way to counter it. Venomous Indian snakes became objects of intensive scientific study and laboratory experimentation—an endeavour that had never been seen in India before.

However, the colonial scientific and medical institutions created a space where high quality medical engagement with Indian snakes and their venom had gainfully converged. The publication on venomous Indian snakes—comprising of various topics such as possible medical treatment of snake poisoning, snake taxonomy and nomenclature, toxicology, indigenous drug production etc.—in the periodicals and proceedings of these societies were shortly but surely informed by the medical exigencies of the empire. For example, the proceedings of the Medical and Physical Society of Calcutta, dated 6 February 1830, noted:

The Secretary submitted to the meeting an account of the bite of a snake, successfully treated, communicated by Brigadier Wilson, commanding at Naserabad...There are several points of scientific interest, upon which we understand the Committee of the Society are anxious to obtain information from resident member...Well authenticated details concerning the bites of venomous serpents form also a desideratum in our Eastern literature. A particular description of the reptile called *Biscopra*, and believed by the native to be deadly poisonous, would be also desirable—as well as a description, and well authenticated particulars of the *Cobra Manilla*, &c (Medical and Physical Society 1830, 135).

The proceedings thus described the context in which the European phobia about venomous Indian snakes was translated into an India centric purpose of ophiological knowledge among the more scientifically oriented Europeans in India. Medical-zoological study of snakes thus became the only possible way to mitigate

the disease of snake poisoning and thus heal the prevalent ophidiophobia of Europeans. Indeed, European surgeon-naturalists found advantage in the idea that the gathering of medical-zoological knowledge about Indian snakes and their venoms could induce the best management of snake-ridden Indian condition, as it would assist colonisation by reducing the risk of the lives of Europeans and their 'native' assistants from possible snake poisoning (see Russell 1796, v–ix).

What is important to notice is that, from the outset, medical-zoological study of Indian snakes essentially became a project of the Company Raj aimed at exercising command over Indian 'wild' landscape and 'native' people. European medical practitioners rendered invaluable services to find suitable remedy of snake poisoning alright, particularly through their researches and publications, but there is no reason to imagine their roles as power-neutral. European physician-naturalists, who participated in the scientific and medical institutions' scholarly pursuits of knowledge about snakes and their venoms, did never fritter any single opportunity to condemn Indian disease-laden condition and assert Western superiority over India. As said before, the EEIC's medical officers believed that Indian warm climate was responsible for various fatal and incapacitating maladies and as European contact with this disease-laden landscape gradually increased through more and more imperial conquest and domination, the colonisers became more susceptible to tropical diseases like snake poisoning, etc. Interestingly, from the end of the eighteenth century, an overbearing scientific confidence was noticed in colonial medical discourses that any disease endemic to the tropics could be cured only through the superior knowledge and skill of Western medicine and health programme and the 'torrid zone' thus could be brought under effective control (Chakrabarti 2012, 3–9). With this 'curative confidence' medical men stationed in various parts of British India, explored various possibilities of understanding snake envenomation, a disease of warm climates, in terms of a new medical specialisation. The idea of tropics and the emergent discipline, tropical medicine, provided them the opportunity to construct a fundamental difference between Europe and India, intending that the temperate European landscapes, climate and constitutions were superior to those of tropical India. 'In this view European medical intervention represented progress towards a more "civilised" social and environmental order' (Arnold 1989, 3).

The hegemonic project of bringing snake-infested tropical landscape and its denizens under complete control of the British imperial power was enormously facilitated by the Western exercise of denigrating all the age-old 'native' snakebite-cures as irrational and superstitious. For example, a common indigenous *materia medica* for snakebite, widely used and well known in pre-colonial India as 'bezoar' or 'snake stone', appeared to colonial experts as a mere collection of unscientific practices based on inaccurate knowledge. However, before the last quarter of the eighteenth century, there was hardly any western tradition of questioning the medicinal value of snake stone. Rather, according to French traveller Tavernier, it

was extremely effective when used as an antidote to snake venom (Tavernier 1889, 152). But after the institutionalisation of ophiological knowledge in India, the entire scenario changed rapidly. J. Davy, a reputed physician and interlocutor associated with the Asiatic Society, after examining a few snake stones, claimed that the phenomenon was a hoax and its reputations among the natives were based on popular imagination (Davy 1820, 321). In the same vein, another famous snakebite medicine ‘Tanjore pill’ was also encountered and discredited by scientific experimentation of the colonial practitioner (Boag 1799, 112–113). Thus the initiation of colonial studies of Indian snakes and their venoms marked a period in which the colonisers in general were not interested in acknowledging the traditional healthcare system of the Other. It is important to mention here that, most of the ‘native’ people, who lived in remote villages where the cases of snakebites were most frequent, were hardly served by the Western practitioners, engaged mainly at army hospitals and dispensaries in the town areas. Therefore, ‘natives’ were often not in a position to enjoy Western medicine and healthcare system and perhaps, not really regretted for that, relied extensively on the expertise and knowledge of indigenous snakebite-curers like Ojhā, Guṇin, Kavirāj, Vaidya and Hākimin the genuine cases of envenomation. These indigenous medicine-men, who were experts in healing snakebite in their own ways and over a long period fruitfully treated ‘native’ victims, continued their practices unabated among countrymen despite the triumphant march of Western medicine.¹⁴ Interestingly, these skilled snakebite-curers were negated by the colonisers as ordinary ‘magicians’ or ‘sorcerers’ or mere ‘snake charmers’ who were ‘exceedingly dexterous’ to ‘handle poisonous snakes freely and without fear even when in possession of their fangs’ (Fayrer 1872, 149). According to the colonial account, these ‘native’ healers were well aware of the danger, and knew ‘perfectly well that no antidote has any effect’, though cleverly pretended to ‘prevent or cure bites by roots and snake-stones’ (Fayrer 1872, 149). Therefore, it is quite natural that despite their ‘wizardry’ skill in ‘black magic’ and performance of ‘mysterious rites’ they were not able to save snakebite victims from deaths (Somerville 1931, 74–77). Thus the colonial accounts absolutely nullified any possible existence of rationale behind the medical practice of ‘native’ doctors. To the colonisers, these indigenous snakebite-curers were only ‘mystery men’ (Somerville 1931, 75) and were never treated as a ‘gentlemen’ physicians however skilled they might have been. This indicates that, there was a strong Western sense of cultural superiority which perhaps boosted the colonisers to attain a position of mentors possessing accurate knowledge of the Orient and therefore competent to judge whatever Oriental, particularly the traditional healers of the East and their ‘ignorant’ patients.

¹⁴ As we see, in nineteenth-century Bengal, lots of vernacular medical texts began to be published, which dealt with cure of snake poisoning through traditional method. In these texts, Bengali healers often pleaded for revitalisation of ancient medical heritage of snakebite-cure. See Ray 1887; Ray 1897; Siddhanta 1897.

Actually, European practitioners were always inclined to depend on their own 'scientific' endeavour which allowed them to negotiate from 'a vantage point and with a clarity, determination and aggression which his "native" opponent could hardly match' (Kumar 2006, 33).

European medical practitioners arrogated to themselves complete monopoly of the authoritative knowledge of the diseases of hot climates including envenomation by Indian snakes, precisely because of their belief that Europe only possessed the universal knowledge to comprehend and control the limits of the world. On 22 July 1809, Civil Surgeon John Macrae proudly wrote to John Fleming, President of the Medical Board of Fort William, that he was fortunate to possess adequate knowledge of Western medicine, which 'happily counteracted' the fatal effect of the 'disease in the human body, consequent to the bite of the serpent' (Macrae 1810, 309). Indeed, by that time, most European doctors in India became confident that they alone could master such cruel disease of the colony and this confidence rapidly spread among western practitioners working in the whole of non-European world. After conducting a dozen of experiments on the effect of snake venom on some robust dogs, one of them wrote in an article in the *Asiatick Researches*:

I am therefore still of opinion, that the (Western) method of cure mentioned in the foregoing paper is the most rational, and the most likely to succeed in preventing death, as well as the other bad consequences which sometimes follow the bite of a serpent that is not mortal. In the use of the nitric acid bath, I should have much confidence: and this confidence arises from a greater experience of its powerful influence upon the human body in different diseases: this experience will soon be communicated to the public by my friend Mr. SCOTT, whose labours in the application of a most powerful and useful agent in medicine, and especially useful as applied to the inhabitants of warm climates, merit the greatest praise (Boag 1799, 125–126, Parenthesis added).

Thus tropical medicine and subsequent healthcare strategy, in course of healing the sick, also became a symbol of superiority to justify the colonisers' mastery over the 'inhabitants of warm climates'. Indeed, the hegemonic power of Western medical knowledge provided the colonisers an opportunity to explain the indigenous inhabitants as naturally inferior and backward and also mark the prevailing indigenous healthcare system as utterly unscientific and ineffective.

Perhaps, the disease of snake poisoning had thrown a moral challenge to the colonial physicians and they evidently saw themselves as saviours, religiously responding to the call of the helpless indigenous people facing probable death by snake poisoning and were proud to take charge of the 'terror' of the disease. For example, one of the esquires of the EEIC, John Williams vividly narrated over half a dozen cases of snakebites between August 1780 and September 1788 where all

the victims were invariably 'native' people (Williams 1790). In his view these Indians seemed to be the 'white man's burden', entirely dependent for their survival on British rational thinking and medical practice; as if the 'white man', was morally obliged to rescue and civilise them. In the narration of this British medical practitioner, the natives were portrayed as first applying their own process of 'Prayers and superstitious incantations' (Williams 1790, 255) to get cured of venom and when failed miserably, desperately approached Williams, who easily saved their lives with few drops of medicine. About one such incident in July 1782, Williams wrote:

On being informed of the accident (of a Hindu Brahmin woman), I immediately sent a servant with a bottle of the Volatile Caustic Alkali Spirit, of which he poured about a teaspoonful, mixed with water, down her (a Hindu Brahmin woman) throat, and applied some of it to the part bitten. The dose was repeated a few minutes after, when she was evidently better, and in about half an hour was perfectly recovered.

This accident happened in a small hut, where I saw the snake, which was a middle-sized *Cobra de Capello*. The *Bráhmens* would not allow it to be killed. In the above case, no other means whatever were used for the recovery of the patient than are here recited (Williams 1790, 255, Parenthesis added).

Thus excellence, expertise and effectiveness of Western medicine and health policy, as intended by Williams, were forcefully established and after successfully applying a reviving remedy he bragged: 'it points out the means of obtaining the greatest self-gratification the human mind is capable of experiencing; that of the preservation of the life of a fellow-creature, and snatching him from the jaws of death' (Williams 1790, 254). This account paints the Indian 'fellow creature' as extremely helpless before the 'jaws of death' and glorifies the greatness of the alien protector, a knowledgeable British physician, who salvaged these feeble 'native' people by few drops of Western medicine. The victory of Western medical science over the diseases of snake poisoning in the tropical landscapes was thus projected and also justified.

CONCLUSION

This paper shows that the British imagination of the snake infested Orient/tropics and colonial medical studies regarding snakes and their venoms were often laced with a sub-terranean discourse of colonial difference. Presence of numerous venomous snakes causing substantial deaths due to snakebite envenomation was often characterised as marker of environment that was

essentially an 'Other'. This Otherness rubbed off on the venomous snake species of India as well and they came to be represented essentially as 'terror'; snakes became particularly emblematic of 'disorder'. We argue that in expressing the condition of snake-ridden tropics or the Orient as 'wild' through certain metaphors and tropes, Western medical practitioners simultaneously underwrote their positional superiority of being denizens of civilised and enlightened Europe and, in doing so, they constructed the entire tropical landscape as colonisable Other. In this context, Western/tropical medicine and healthcare system became the symbol of 'superiority' on which the colonisers justified their mastery over the 'inhabitants of warm climates' and wilfully discarded all traditional local knowledge that might—of course, if properly evaluated and developed—have helped them in coping with the disease of snake poisoning. Thus, colonial medical engagement with venomous snakes and consequential health measures, which flourished under British agency, provided the tools to order and control the snake-ridden landscape of India and paved the way for the assertion of an intellectual superiority over the colonised people. In this regard, we can say that Western medicine and public health work, not only as practice but also as ideology, served to justify the colonial rule and became a true instrument of the British Indian Empire.

There is no paradox that, the Orientalist mechanism of 'knowing' the venomous snakes and the inhabitants of snake-infested country, enabled European intellectual mastery over the tropics and inevitably furthered the colonial presence in tropical India. But, it is also mentionable here that British management of Indian snakes and their venoms in early colonial period had not followed a strong way of coercion like colonial policies of quarantine and vaccination schemes (see Arnold 1993; Harrison 1994), and therefore did not become a constant site for 'native' unrest and resistance. Socio-culturally Indians remained intimately associated with snakes and their medical engagement with snakebites which was varied and traditionally enriched also continued at least in the remote areas. It was on a later occasion when Indians protested against the extensive state-sponsored bounty-killing of snakes during the last quarter of the nineteenth century. This was an endeavour taken by the colonial government as a means of dealing with the problem of snakebite deaths as the long-drawn medical research in India failed to find any effective antidote till date—an interesting issue which received only scarce attention in recent historiography (see Chakrabarti 2012, 124–127). The debate over the large-scale uses of animals including snakes and their vivisection in colonial laboratories also remains to be taken up as a legitimate area of detailed study. However, the present paper has studied snakes and snakebites in early British India as a lens through which it has tried to offer some insights for future research and discussion.

REFERENCES

- ANONYMOUS. (1876). *India: Illustrated*. New York: Dodd, Mead, and Company.
- ARNOLD, D. (1989). Introduction: Disease, Medicine and Empire. In D. Arnold (Ed.), *Imperial Medicine and Indigenous Society*. Delhi: Oxford University Press. 1–26.
- ARNOLD, D. (1993). *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India*. Berkeley and London: University of California Press.
- ARNOLD, D. (1996a). Introduction: Tropical Medicine before Manson. In D. Arnold (Ed.), *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900*. Amsterdam and Atlanta: Rodopi Press. 1–19.
- ARNOLD, D. (1996b). *The Problem of Nature: Environment, Culture and European Expansion*. Oxford: Blackwell Publishers.
- ARNOLD, D. (2005). *The Tropics and the Travelling Gaze: India, Landscape, and Science 1800–1856*. Delhi: Permanent Black.
- BALA, P. (1991). *Imperialism and Medicine in Bengal: A Socio-Historical Perspective*. New Delhi: Sage Publication.
- BISWAS, A. (Ed.), (2009). *Vijay Gupter Manasā Maṅgal (Manasāmaṅgal by Vijay Gupta)*. Kolkata: Anjali Publishers.
- BHATTACHARYA, A. (2006). *Folklore of Bengal*. New Delhi: National Book Trust.
- BHATTACHARYA, B. (Ed.), (1961). *Ketakādās Kṣemānanda Manasāmaṅgal (Manasāmaṅgal by Ketakādās Kṣemānanda)*. New Delhi: Sahitya Akademi.
- BHATTACHARYYA, A. (Ed.), (1962). *Bāiś Kabir Manasā-Maṅgal Ba Bāiśa (Manasāmaṅgal by Twenty-two Poets)*. Calcutta: Calcutta University Press.
- BHATTACHARYYA, A. (1970). *Bāṅglā Maṅgalkāvya Itihās (History of Bengali Maṅgalkāvya)*. Kolkata: A. Mukherjee and Co. Pvt. Ltd.
- BHAUMIK, R. (2011). Ophiology of India: Snakes, Colonial Medicine and Orientalism. *International Journal of Physical and Social Sciences*. Vol. 1 (3). 35–63.
- BHAUMIK, R. (2012). The Natural History of Indian Serpents: Dr. Patrick Russell, Colonial Medicine and the British Empire. *History Studies: International Journal of History*. Vol. 4 (4). 170–193.
- BHISHAGRATNA, K. K. (Trans.), (2012). *Suśruta Saṁhitā: Text with English Translation, A Full and Comprehensive Introduction, Additional Text, Different Readings, Notes, Comparative Views, Index, Glossary and Plates*. Vol. 3. Varanasi: Chowkhamba Sanskrit Series Office.
- BOAG, W. (1799). On the Poison of Serpents. *Asiatick Researches*. Vol. 6. 103–126.
- CHAKRABARTI, P. (2012). *Bacteriology in British India: Laboratory Medicine and the Tropics*. Rochester, NY: University of Rochester Press.
- CHAUDHURI, B. B., BANDOPADHYAY, A. (Eds.), (2004). *Tribes, Forest and Social Formation in Indian History*. New Delhi: Monohar.
- CORBETT, J. (1968). *My India*. Madras: Oxford University Press.
- CURTIN, P. D. (1989). *Death by Migration: Europe's Encounter with the Tropical World in the Nineteenth Century*. Cambridge: Cambridge University Press.
- DA ORTA, G. (1913). *Colloquies on the Simples and Drugs of India*. London: Henry Sotheran and Co.
- DAVY, J. (1820). Analysis of the Snake-Stone. *Asiatick Researches*. Vol. 13. 317–328.
- DEORAS, P. J. (1978). *Snakes of India*. New Delhi: National Book Trust.
- DIMOCK, E. C. (1962). The Goddess of Snakes in Medieval Bengali Literature. *History of Religions*. Vol. 1 (2). 307–321.
- DIMOCK, E. C., RAMANUJAN, A. K. (1964). The Goddess of Snakes in Medieval Bengali Literature. Part II. *History of Religions*. Vol. 3 (2). 300–322.
- DRAYTON, R. (2005). *Nature's Government: Science, Imperial Britain, and the 'Improvement' of the World*. New Delhi: Orient Longman.

- FAYRER, J. (1872). *The Thanatophidia of India being a Description of the Venomous Snakes of the Indian Peninsula, with an Account of the Influence of their Poison on Life and a Series of Experiments*. London: J. and A. Churchill.
- FAYRER, J. (1878). *Destruction of Life by Wild Animals and Venomous Snakes in India*. London: Royal Society of Arts.
- FAYRER, J. (1882). Destruction of Life in India by Poisonous Snakes. *Nature: A Weekly Illustrated Journal of Science*. Vol. 27 (687). 205–208.
- HEBER, R. (1829). *Narrative of a Journey through the Upper Provinces of India, from Calcutta to Bombay, 1824–1825, with Notes upon Ceylon, an Account of a Journey to Madras and the Southern Provinces, 1826, and Letters Written in India*. Vol. 1. Philadelphia: Carey, Lea and Carey.
- HARRISON, M. (1992). Tropical Medicine in Nineteenth-Century India. *The British Journal for the History of Science*. Vol. 25 (3). 299–318.
- HARRISON, M. (1994). *Public Health in British India: Anglo-Indian Preventive Medicine 1859–1914*. New Delhi: Cambridge University Press.
- HARRISON, M. (1999). *Climates and Constitutions: Health, Race, Environment and British Imperialism in India, 1600–1850*. New Delhi: Oxford University Press.
- HEADRICK, D. R. (1981). *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century*. New York and Oxford: Oxford University Press.
- JEFFERY, R. (1988). *The Politics of Health in India*. Berkeley and Los Angeles: University of California Press.
- KUMAR, A. (1998). *Medicine and the Raj: British Medical Policy in India, 1835–1911*. New Delhi: Sage Publications.
- KUMAR, D. (Ed.), (2001). *Disease and Medicine in India: A Historical Overview*. New Delhi: Tulika Books.
- KUMAR, D. (2006). *Science and the Raj: A Study of British India*. New Delhi: Oxford University Press.
- KUMAR, D., BASU, R. J. (Eds.), (2013). *Medical Encounter in British India*. New Delhi: Oxford University Press.
- KIPLING, R. (2015). *The Jungle Book*. London: Puffin Books.
- MACKENZIE, W. (1820). An Account of Venomous Sea Snakes, on the Coast of Madras. *Asiatick Researches*. Vol. 13. 329–336.
- MACRAE, J. (1810). Case of the Bite of a Poisonous Snake Successfully Treated. *Asiatick Researches*. Vol. 11. 309–317.
- MAITY, P. K. (1966). *Historical Studies in the Cult of the Goddess Manasā: A Socio-Cultural Study*. Calcutta: Punthi Pustak.
- MEDICAL AND PHYSICAL SOCIETY (1830). Proceeding of Medical and Physical Society. *Gleanings in Science*. Vol. 2. 135–136.
- MEHTA, P. M. et al. (Eds.), (1949). *The Caraka Saṃhitā: Expounded by the Worshipful Ātrēya Punarvasu Compiled by the Great Sage Agnivēṣa and Redacted by Caraka and Dridhabala*. Vol. 4. Jamnagar: Shree Gulabkunverba Ayurvedic Society.
- METCALF, B. D., METCALF, T. R. (2008). *A Concise History of Modern India*. New Delhi: Cambridge University Press.
- METCALF, T. R. (1998). *Ideologies of Raj*. New Delhi: Cambridge University Press.
- OLDHAM, C. F. (1905). *The Sun and the Serpent: A Contribution to the History of Serpent-Worship*. London: Archibald Constable and Co. Ltd.
- PALIT, C., DUTTA, A. K. (Eds.), (2005). *History of Medicine in India: The Medical Encounter*. Delhi: Kalpaz Publications.
- PATI, B. (Ed.), (2011). *Adivasis in Colonial India: Survival, Resistance and Negotiation*. New Delhi: Orient BlackSwan.
- PATI, B., HARRISON, M. (Eds.), (2006). *Health, Medicine and Empire: Perspectives on Colonial India*. New Delhi: Orient Longman.
- PATI, B., HARRISON, M. (Eds.), (2009). *The Social History of Health and Medicine in Colonial India*. London and New York: Routledge.

- POOL, J. J. (1894). *Half Hours with the Hindus*. London: Ward, Lock, and Bowden, Ltd.
- RANGARAJAN, M., SIVARAMAKRISHNAN, K. (Eds.), (2012). *India's Environmental History: Colonialism, Modernity, and the Nation: A Reader*. Ranikhet: Permanent Black.
- RAY, K. L. (1897). *Sarpāghāter Cikitsā (Treatment of Snakebite-Injury)*. Kolkata: Author.
- RAY, T. (1887). *Sarpadañśān Cikitsā (Treatment of Snakebite)*. Kolkata: Yadav Chandra Lahiri.
- REID, H. A. (1976). Adder Bites in Britain. *British Medical Journal*. Vol. 2 (6028). 153–156.
- RIVETT-CARNAC, J. H. (1879). *Rough Notes on the Snake Symbol in India, in Connection with the Worship of Siva*. Calcutta: The Asiatic Society of Bengal.
- RUSSELL, P. (1796). *An Account of Indian Serpents, Collected on the Coast of Coromandel; Containing Descriptions and Drawings of Each Species; together with Experiments and Remarks on their Several Poisons*. London: W. Bulmer & Co. Shakspeare Press.
- SAID, E. W. (2001). *Orientalism: Western Conceptions of the Orient*. New Delhi: Penguin Books.
- SEN, S. (Ed.), (1953). *Vipradāsa's Manasā-Vijaya: A Fifteenth Century Bengali Text Edited with a Summarised Translation, Notes and Glossary and with an Introduction on the Literature, Myth and Cults Relating to Manasā*. Calcutta: The Asiatic Society.
- SEN, S. (Ed.), (1968). *Viṣṇu Pāla's Manasā-Maṅgala*. Calcutta: The Asiatic Society.
- SHARMA, J. (2012). *Empire's Garden: Assam and the Making of India*. Ranikhet: Permanent Black.
- SHARMA, M. (2012). *Indigenous and Western Medicine in Colonial India*. New Delhi: Foundation Books.
- SIDDHANTA, R. C. (1897). *Sarpāghāt Cikitsāsār (A Compendium of Treatment for Snakebite-Injury)*. Kolkata: Sarada Prasad Sen.
- SINHA, B. C. (1979). *Serpent Worship in Ancient India*. New Delhi: Books Today.
- SLOUBER, M. (2017). *Early Tantric Medicine: Snakebite, Mantras, and Healing in the Gāruḍa Tantras*. New York: Oxford University Press.
- SMITH, W. L. (1980). *The One-eyed Goddess: A Study of the Manasā-Mangal*. Stockholm: Almqvist and Wiksell International.
- SOMERVILLE, A. (1931). *Crime and Religious Beliefs in India*. Calcutta: The Criminologist.
- SWAROOP S., GRAB, B. (1954). Snakebite Mortality in the World. *Bulletin of the World Health Organization*. Vol. 10 (1). 35–76.
- TAVERNIER, J. B. (1889). *Travels in India*. Vol. 2. London: MacMillan and Co.
- VOGEL, J. P. (1926). *Indian Serpent-Lore or the Nagas in Hindu Legend and Art*. London: Probsthain.
- WARRELL, D. A. (2005). *Guidelines for the Clinical Management of Snake Bites in the South-East Asia Region*. New Delhi: World Health Organization.
- WILLIAMS, J. (1790). On the Cure of Persons Bitten by Snakes. *Asiatick Researches*. Vol. 2. 254–258.
- WORBOYS, M. (1976). The Emergence of Tropical Medicine: A Study in the Establishment of a Scientific Specialty. In G. Lemaine, R. MacLeod, M. Mulkay and P. Weingart (Eds.), *Perspectives on the Emergence of Scientific Disciplines*. The Hague: Mouton. 75–98.
- WORBOYS, M. (1988). Manson, Ross and Colonial Medical Policy: Tropical Medicine in London and Liverpool, 1899–1914. In R. MacLeod and M. Lewis (Eds.), *Disease, Medicine, and Empire: Perspectives on Western Medicine and the Experience of European Expansion*. London and New York: Routledge. 21–37.
- WORBOYS, M. (1993). Tropical Diseases. In W. F. Bynum and R. Porter (Eds.), *Companion Encyclopedia of the History of Medicine*. London and New York: Routledge. 512–536.

