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on
History of Diseases and Medicine
in India and Beyond

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Introduction to the volume

History of Medicine is a sub-discipline and research area that has been growing in different shapes and contours for the last few centuries. The orientation to history of medicine in India emerged ever since the nineteenth century. The exercise was undertaken by two groups of colonial scholars. The first group essentially comprised Indologists who retrieved manuscripts and had begun to look into and read Sanskrit and Persian texts on medicine. They often reviewed Indian works on medicine as cultural texts in the light of modern western episteme.[1] A number of Indian scholars were also involved in retrieving classical texts on medicine from the 1870s and a few of them turned to writing a history of medicine on the lines set down by pioneering scholars like H.H. Wilson.[2] The third group of scholars were practicing physicians serving the colonial institutions. Many of them tumbled upon Indian practices related to health, especially Ayurveda, Unani, Siddha systems and responded to these in terms of their professional interest, which often went beyond the immediate and practical to the academic.[3] But a large number of practicing physicians had entered into the portals of history of medicine through their commissioned works. They left official and personal reports on their service conditions or on diseases encountered. The body of official and public records related to medical practices grew with the institutionalization of medical service. Some of these were officially commissioned reports on epidemic diseases like malaria[4], cholera[5], small pox[6] etc., which have now become the source books for present day historians.

The modern day episteme and concept of social history of medicine had to wait for the late 20th century to take off. A group of scholars edited collections of essays on Asian and Indian medicine towards the

end of the 1970s and in the 80's.[7] Another major attempt was made under the direction of D. P. Chattopadhyaya from the Centre for Studies in Civilizations, where essays on histories of science, technology and medicine along with philosophy were made into a series of volumes.[8] O. P. Jaggi took the initiative to write on the ancient chapter of medicine in India and his encompassing work was published in 1981.[9] However, the first batch of historians who wrote critical stand - alone works on the social history of medicine in India included Poonam Bala[10], David Arnold[11], Mark Harrison[12], Deepak Kumar[13] and Anil Kumar[14], among others. Their works got published through the decade of the 1990s and set the trend of new research. We are indebted to them. But still the history of medicine remained bound for some time within a critique of colonial interventions and evaluation of indigenous engagements. There has been attempts to focus on policy making, especially highlighting public health, processes of institutionalization of health service and medical education.

It is only very recently that a kind of hesitant step is being ventured towards understanding the issue of health in general, both as a social phenomenon with an open approach to diseases and medicine as a social concern as well as a service based applied knowledge. Many of the stalwarts, with whom the journey of the modern chapter of history of medicine had been initiated later contributed more to these understandings and were joined by a new batch of historians who added fresh perspectives and themes in the first two decades of the 21st century. It is needless to say that a social history approach to health and medicine opens the gate to multitudes of perspectives. Medicine thus is observed in these lenses as a trajectory of social history with a wider canvas where the thrust on hybrid knowledge and plural medicine add immensely to the more formal and older traditions of doing the history of medicine. The recent trend toward a cultural history of medicine is opening the doors to new conception of the sites and themes of research, no longer bound within the earlier defining parameters. A floodgate opened with Michel Foucault's path breaking works bringing in a radical conception of power, highlighting

the social and ideological stakes playing in the field of institutionalized medical services. The turn took more towards semiotics of social relations and ultimately towards a cultural turn in the history of medicine.[15] It is not only medicine as a practice and knowledge that is important now but health and remedies perceived from a broader purview of history assumes more importance within chosen specificities of enquiry.

Medical engagements have transcended the boundaries of nations since time immemorial and had spread throughout the globe even before the era of "discovery" of the east by the west. Concerns for health and medical culture therefore cannot be observed in isolated contexts as such engagements could not have been bred in isolation. The present world of medicine is moored to global interventions, not only for regulatory and consequent legitimation and commercial processes, but also as the globe comes closer in organizational role in mitigating major health disasters, amply evident in the current times of global crisis we are faced with now. This needs to be understood from multiple operational dynamics. Finances, funding, philanthropic contributions, state interventions, institutional processes bring together aspects of the public and private worlds of medicine and health. Moreover, the global scope of the social history of medicine also assumes more significance as we increasingly encounter the reality of how the multiple strands of what we know as alternative or even hybrid health practices tend to play more important part in present socio-economic contexts, having been transformed into the spectrum of capitalized services and products.

It devolves upon the historian to track this discursive trajectory of history of medicine from a social perspective where the health related practices assume other significances and require new kinds of "explanatory affects", to borrow the idea from Hayden White.[16] Medicine is reviewed as a site of practices, practice – based knowledge in its social scope and this becomes more important as we travel back from the modern to the pre modern contexts. At the same time, it is imperative that we explore and situate these histories in wider contexts

even if to get a sense of the ubiquity of health concerns and associated frames of knowledge and systems of control which overlay any engagement between society and health care facilities. These are basically some of the aspects that have assumed importance in the circuit of historians. The present seminar was basically intended to bring about a group of scholars who would especially focus on the primary aspect of medicine especially focusing on concepts of diseases, state and non-state institutional approaches to treatment and social impact of diseases.

The Asiatic Society, which has heralded the study of medicine from historical as well as scientific perspectives in the scholarly circuit was the ideal institution to host the Two-Day seminar on *Health, Diseases and Society: History of Medicine in India and Beyond* in February, 2019. We, the conveners of the seminar, are thankful that The Asiatic Society decided to bring out the proceedings of the seminar as a special issue of the journal.

Varied themes were addressed by various contributors at the seminar. The session covered the development of engagements with health and medicine through different phases of Indian history, early to pre modern, colonial to contemporary. The volume begins with Dr. Nayana Sharma Mukherjee who explores the fundamental question of how illness was understood in early history in both the medical and non-medical circuits. The varied concepts and concerns reveal a rich cultural kaleidoscope, highlighting on the deeper nuances of social engagements with health in ancient India. The second article by Nupur Dasgupta focuses on a singular disease, *prameha*, or polyuria through a reading of major Ayurvedic texts ranging in date from the first century BCE to the 12th century CE. She tracks the intricate conceptual evolution through phases and analyses how a system-bound tradition in medical pedagogy was building up, much riddled with confusions and lacunae, deeply impacting the social aspects of treatment. According to her, while leading on to a tentative disease nosology, the process of investigation ultimately gave in to the pressures of tradition and broke away from a clear conceptualization of the group of diseases that prameha stood for.

The third article represents a chapter from the early modern times, a phase which was rich in yielding a motley culture of health, what with the gradual entry of western ideas and concepts and the encounters with various forms of traditional knowledge and practices. Tutul Chakravarti, an opthalomologist and Ranabir Chakravarti, the eminent historian report their findings related to an exemplary pre modern health institution set up at the beginning of the 19th century by the head of the native state of Tanjore, Maharaja Serfo Ji II Bhonsle. Having received a missionary education and bearing an enlightened mind, he was perhaps one of the first of westernised Indians with a strong orientation to western knowledge and its dissemination. This was amply attested by his personal supervision of the Saraswati Mahal Library set up earlier by the Nayakas and foundation of the eye hospital at Thanjavur. The authors ventured to look into the preserved medical registers from the hospital and analyse the data with respect to the indications of medical treatment within the institution as well as the wider matrix of a functioning health institution bordering on western and indigenous cultural – medical spaces.

The next two articles explore into the frame of ecology of diseases in two very different contexts, one looking into the sylvan terrains which was fast coming under colonial state's governance and control and the other searching into the emergent urban scene in the colonial city of Calcutta. Sanjukta Das Gupta takes a comprehensive perspective on health, diseases and the environmental context throughout the 19th century in the region of Chotanagpur and the Santal Parganas, presently within the state of Jharkhand. Her article strides the scene from the 19th to the 20th centuries. The longue durée view has enabled her to assess the intricate and indelible impact on the ecology wrought by human intervention. She especially highlights the devastating impact of policy changes under the British rule leading to depletion of forest cover, shortage of food and fuel for the autochthonous people, leading to the rise and spread of diseases. She looks into the tone of the rising debates among the western medical professionals, who often presented racial tropes on diseases.

Mahua Sarkar's article covers the 19th century, within which she attempts to comprehend how notions of pollution changed in the social sense and how a medical sense gradually got attributed to it, especially under the impact of western science both through theoretical disseminations and practical implementations of sanitary schemes. She then observes the rising concerns for public health in the context of Bengal and especially the city of Calcutta, linking it up with the growing urban projects undertaken by the municipal authority. She explores the great urban divide, perceived in racial terms and searches into the ways in which these deep-set convictions impacted policies of public health and how then the indigenous public responded in multiple ways.

B. Eswara Rao writes on medical and sanitary interventions on the part of the colonial state with reference to tuberculosis in South India from the turn of the 19th century to the first half of the 20th. His study leads to a deep understanding of the nuances of 'official' politics heavily invested with what he terms "colonial priorities" when it came to deploying public health measures for managing epidemics and infectious diseases. The lateness in initiating and organizing meaningful institutional care and awareness programmes have been pointed out in critique of the government's attitude towards a severe illness that wreaked havoc with lives of the multitudes.

History of smallpox in colonial India has received abundant attention from scholars of South Asia. Existing literature has thrown light on indigenous perceptions of the disease, different aspects of colonial control, prevention policy and indigenous responses to colonial measures. Existing evidence reveals that some of the worst sufferers were the children. Most studies however deal cursorily with this question. The authors of the next article, Sujata Mukherjee and Nilanjana Basu trace this neglected aspect of the impact of small pox on children in colonial Bengal. They have conducted a deeper study on the virulence of the epidemic, effectiveness of the control measures, colonial public health policy and the colonizers' as well as indigenous perceptions and responses to the disease and policies, throwing light

on the social and psychological aspects of the indigenous responses. Delving into unexplored archival and other primary sources, the authors seeks to situate the impact of small pox on children in the context of colonial measures.

Arabinda Samanta presents a focused analysis of the role of the International Health Board and the Rockefeller Foundation (RF), U.S.A in providing aid for the tackling of malaria endemic and other health issues in Bengal from the second decade of the 20th century onward. The article thus moves away from the state - centric optic, focusing on non - governmental bodies, not the least on the people's role in Bengal in coming together under the Central Cooperative Anti-Malarial Society. Samanta also explores into the development of critically important research bodies and educational institutions in Calcutta established at the behest of the International Health Board. He ends with a pertinent critique of the rather unenthusiastic attitude of the British government towards these philanthropic activities of the Rockefeller Foundation and the IHB.

Two articles that follow next, present the post-colonial scene on health and medicine in India, engaging critically with the government policies on health in independent India. Achintya Kumar Datta writes about the raging scourge of tuberculosis in post - independence India. Sensitizing on the social aspects of the disease, Dutta highlights the contributing factors like poverty, ignorance and gender inequality and draws attention into the huge negative impact of social quarantine on the family of patients. His review of the role of the Indian government reveals its failure to implement an effective policy in setting up a proper infrastructure for controlling the disease. Not surprisingly, Dutta makes a plea for a social medicine approach for managing diseases in contemporary India.

Sutapa Saha Mitra's paper focuses on the historical process of rehabilitating Ayurveda within the framework of national and international regulations between 1970-2010. The paper explores into the contemporary scene of hospital treatment offered at the three Kolkata-based, State-run Ayurvedic hospitals. She highlights the scene

of competitive medical treatment where, in spite of major adaptations and modernization of Ayurveda on the lines of conventional medicine, the traditionally moored Ayurvedic practitioners are increasingly seen cherry-picking non-fatal and non-communicable diseases.

The bouquet of articles ends with Deepak Kumar's widely encompassing contribution. The article traverses the world beyond South Asia and at the same time draws interesting links with what was happening in the subcontinent. The author exhibits his characteristic command over the genre in his longue durée review of the ways in which medical knowledge and practices evolved under the Dutch in the East Indies, adding pertinent points of comparison with policies and conditions of health and medicine in India under the British at the time. This article, along with that of Arabinda Samanta, touch upon the much needed wider lens, providing a glimpse into the global scale of engagements related to health and medicine in the colonized environs.

For at least three decades, historians have investigated the relationship between western medicine, imperial policy and colonial rule. The articles offered in this special issue attempt at going deeper into select aspects of research on health, diseases and society, entering into newer orbits and horizons under this rubric.

We end these introductory words expressing our special thanks to the President, General Secretary, Treasurer, members of the executive committee and staff of The Asiatic Society for their immense help towards organizing the seminar. We are deeply indebted to Professor Arun Bandopadhaya, Historical Secretary and Professor Ramkrishna Chattopadhyay, Publication Secretary, The Asiatic Society, for their constant support and valuable suggestions. Especial thanks are due to the contributors of this volume and to those of the participants who made time to join us for the occasion and provided valuable suggestions which went to enrich not only the seminar but also helped in conceptualizing and framing this volume. We also express our thanks to Dr. Bandana Mukherjee, Research Officer, The Asiatic Society, for her untiring cooperation and help. Lastly, we would like to express

our deep respect in memory of Mr. Kabi Roy, Senior Stenographer, whose unstinted help led a long way in convening the seminar and whose untimely death left us bereft of a great support at the last hour.

Notes

[1] Horace Haymen Wilson, "On the Medical and Surgical Sciences of the Hindus", *Works of the Late Horace Haymen Wilson*, Vol. III, London, Trūbner & Co., 1864, 269 – 276, 380 – 393. (first published simultaneously in *The Asiatic Journal and Monthly Miscellany*, Volume 16, 1823, 241-243 and The *Oriental Magazine and Calcutta Review*, 1, 207-212 and 349-356.); J.F. Royle, *An Essay on the Antiquity of Hindu Medicine*, London, WM. H. Allen & Co., 1837; T.A. Wise, Commentary on the Hindu System of Medicine, Calcutta, Messrs. Thacker and Co., 1845; A. F. Rudolf Hoernle, *Studies in the Medicine of Ancient India, Part I, Osteology or The Bones of the Human Body*, Oxford, At The Clarendon Press, 1907.

[2] Publication of translations of the major original texts on Indian medicine began around the late 1870s onward and several Indian Sanskritists as well as exponents of indigenous medicine in Bombay, Bengal, Lahore, Varanasi and other places dedicated themselves to such work. One of the major translators were Kunjalal Bhisagratna who wrote an introduction to the translation of *Suśruta Saṁhitā* that covered a historical preview. See Kunjalal Bhisagratna, *An English Translation of The Suśruta Saṁhitā, with full and comprehensive introduction*, 3 volumes Calcutta, (various publishers), 1907 – 1916; Girindranath Mukhopadhyaya may be considered as one of the Indian pioneers in the field of writing a history of traditional Indian medicine. See Girindranath Mukhopadhyaya, *History of Indian Medicine*, 3 volumes, Calcutta, University of Calcutta, 1926.

[3] For a short and critical review see Deepak Kumar, "Medical Encounters in British India, 1820-1920", *Economic and Political Weekly*, Vol. 32, No. 4 (Jan. 25-31, 1997), 166-170.

[4] For example, C. A. Bentley, *Malaria and Agriculture in Bengal: How to Reduce Malaria in Bengal by Irrigation*, Calcutta, Bengal Secretariat Book Depot, 1925.

[5] J. Macpherson, *Annals of cholera from the earliest periods to the year 1817*, London, 1872.

[6] J. Z. Holwell, *An Account of the Manner of Inoculating for the Smallpox in the East Indies*, London, 1767; S. P. James, *Smallpox and Vaccination in British*, Calcutta, Thacker and Spink, 1909.

[7] Charles Leslie, ed., *Asian Medical Systems: A Comparative Study*, Berkeley, University of California Press, 1976; G. Jan Meulenbeld and Dominik Wujastyk, *Studies in Indian Medical History*, Groningen, Egbert Forsten, 1987.

[8] Project of History of Science, Philosophy and Culture Series. See O. P. Jaggi, *Medicine in India: Modern Period, History of Science, Philosophy and Culture in*

Indian Civilization, Vol.IX, Part I, New Delhi, Oxford University Press, 2000.

[9] O. P Jaggi, *Āyurveda: Indian System of Medicine*, Delhi, Atma Ram & Sons, 1981.

[10] Poonam Bala, *Imperialism and Medicine in Bengal: A Socio-Historical Perspective*, New Delhi, Sage, 1991.

[11] David Arnold, *Imperial Medicine and Indigenous Societies*, Manchester, Manchester University Press, 1988; Arnold, *Colonizing the Body, State, Medicine and Epidemic Disease in Nineteeth –Century India*, Berkeley, University of California Press, 1993.

[12] Mark Harrison, *Public Health in British India: Anglo-Indian Preventive Medicine 1859-1914*, Cambridge University Press, 1994.

[13] Kumar, op. cit, (Jan. 25-31, 1997).

[14] Anil Kumar, *Medicine and the Raj: British Medical Policy in India, 1835 – 1911*, New Delhi, Sage Publications, 1998.

[15] See Michel Foucault, 'Birth of Social Medicine', *Power: Essential Works of Foucault 1954 – 1984*, ed., James D. Faubion, Translated, Robert Hurley et al., Volume Three, New York, The New Press, 2000, 134 – 156; See discussions in Roger Cooter, '"Framing" the End of Social History of Medicine', Roger Cooter with Claudia Stein, eds., *Writing History in the Age of Biomedicine*, New Haven, Connecticut, Yale University Press, October 2013, 309 - 337.

[16] Hayden White, *Metahistory: The Historical Imagination in Nineteenth-Century Europe*, Baltimore & London, John Hopkins University Press, 1973, Introduction, ix-x, 12, 29.

Nupur Dasgupta & Sujata Mukherjee
Conveners of the seminar

Social Perceptions of Diseases in Early India

Nayana Sharma Mukherjee

Disease, in the view of medical science, is a physiological process brought on by internal and external factors with its own pathogenesis and characteristic symptoms. For the patient, however, it is not just a physiological encounter. It is more of a personal experience for the process encompasses social and cultural aspects of illness as well.The medical concept of disease may differ from its societal perception and could well involve notions of social isolation and stigmatization. Perceptions of sickness have varied greatly over time and place, shaped by diverse circumstances.[1] In fact, illness may be viewed differently by patients and practitioners.[2] In the context of medicine in early India, patient experiences are not known to us through their own writings, but the classical medical treatises do throw some light on societal perceptions of diseases from the physician's perspective. This paper is an attempt to understand the view of professionals and the laypeople regarding diseases in the context of the two monumental medical treatises of early India, the *Caraka Saṁhitā*[3] and the *Suśruta Saṁhitā*.[4]

Any ordinary normal human being has three basic desires in life, viz., the desire to live, the desire to earn wealth and the desire to perform virtuous acts.[5] The desire for longevity is the foremost; and from it arises the desire for a healthy life that would be devoid of suffering from diseases. The state of *ārogya* or good health does not denote the absence of disease or physical well-being alone. It also encompasses mental and spiritual happiness and fulfilment. The term *āyus*, which is the domain of Āyurveda, is defined as a combination of the body, the sense organs, the mind and the soul. Good health (*ārogya*) assures strength, longevity, happiness and attainment of other desirable objects.[6] According to *Suśruta Saṁhitā*, a *svastha* (healthy) individual is

physically characterised by the equilibrium of the *doṣas*, *agni* (digestive power), *dhātus* (tissues) and *malas* (excretory products), and by the wellness of the soul, the senses and the mind.[7]

Interestingly, there is a reference to this notion of health in the *Buddhacarita* which was composed in the second century CE by the celebrated philosopher and litterateur Aśvaghoṣa. We are told that once the Buddha went to visit the hermitage of his former teacher, Alāra Kālāma, and when they met, they enquired after each other's health (*pṛṣṭvā dhātusāmyaṁ parasparam*).[8] The term used in the text is *dhātusāmyaṁ* i.e., the state when the constituent tissues of the body are in equilibrium. It is this equilibrium that gives *sukha* or happiness. *Dhātusāmyaṁ* is a medical term that occurs in the classical texts of Āyurveda and denotes a state of physical and mental well-being or *prakṛti*.[9] Any alteration of this equilibrium brings discomfort or misery and manifests itself as disease (*dukkha*).[10] The very object of Āyurveda is to achieve the maintenance of the equilibrium or *sāmya* of the tissue elements (*dhātusāmya*).[11] So, it is the task of the wise physician to detect this *vaiṣamya* (disequilibrium) of the tissues by observing the appearance of the patient and the functioning of the sense organs.[12]

Several terms have been used in the texts for the bodily condition that causes discomfort to the individual and unsettles the condition of well-being. Terms such as *vyādhi*, *roga*, *āmaya*, *gada*, *ātaṅka*, *yakṣmā* and *vikāra*[13] are all synonymous of disease but have slightly different connotations. The term '*vyādhī*' refers to ailment or illness in general and is usually employed to mean physical distress as opposed to mental pain, agony or anxiety.[14] The word '*āmaya*' signifies the diseases that originate in the disturbances of digestion, indigestion, constipation, etc., as the term, '*āma*' means 'uncooked' or 'undigested'.[15] '*Gada*' refers to the condition which makes one disabled. Usually, the term is employed to describe diseases that have a multiplicity of causes.[16] '*Ātaṅka*' specifically implies anguish, born out of the realisation that one being disabled, is no longer capable of normal living with regard to food, conduct and enjoyment. It underlines the fact that illness makes life miserable.[17] *Yakṣmā* originally referred to as consumption, came to signify the co-existence of two or more diseases, or the presence of a

large number of symptoms.[18] The disturbance or the alteration of the balance of the body constituents is referred to as *'vikāra'*.[19] The term *'Roga'* highlights the presence of bodily pain as well as mental torment (*rujā*) in diseases,[20] while '*jvara*' is indicative of both psychological and somatic afflictions.[21] However, in our treatises, the terms *roga* and *vyādhī*, have been commonly employed for somatic and psychological disorders.

For the physician, it was important to understand the etiological factors (*nidāna*) responsible for the disturbance of the *doṣas*. The state of equilibrium of the *dhātus* is not disturbed nor is the imbalanced state brought to normalcy without some causative factors.[22] It is these causative factors that determine the state of equilibrium or imbalance of the *dhātus*.[23] The body and the mind are the locale of all diseases. It is only when there is a break in the continuity of the body and the mind, that diseases cannot recur.[24] Three primary factors are identified as being responsible for any disturbance of the *doṣas*, i.e., *asātmyendriyārtha-saṁyoga*, *prajñāparādha* and *kāla*.[25] Diseases relating to the body and the mind arise from the nature of utilisation of the objects of the sense organs (*artha*), actions (*karma*) and time (*kāla*). An individual may indulge in *atiyoga* (excessive utilisation), *ayoga* (deficient utilisation) or *mithyāyoga* (wrong utilisation) of the three elements that causes diseases (*trīṇyāyatanānīti-arthānāṁ karmaṇaḥ kālasya cātiyo¯gāyo¯gamithyāyo¯gāḥ*).[26]

The first causative factor, *asātmyendriyārtha-saṁyoga*, implies the unwholesome association of the sense-organs with their objects; the objects being the auditory, the tactile, the visual, the olfactory and gustatory sensations. Gazing at a bright star for a long time that could result in pain in the eyes constitutes *atiyoga*. If the eyes do not look at anything at all, it would be non-utilisation of the sense of vision. Similarly, looking at things which are too close or too far, looking at awful, terrifying or surprising, contemptuous, frightful or deformed and alarming things are instances of *mithyāyoga* or wrong utilisation of the visual organ.[27] Neither the sense organs nor their objects alone can bring happiness or misery. Misery arises from the way the sense organs are utilised by the individual.[28] When the sense faculties are utilised in any of these flawed ways, an individual suffers from *aindriyaka* diseases.[29]

Improper acts (*karma*) are those relating to speech, mind and body which fall into any of the three categories, viz., *mithyāyoga*, *atiyoga* or *ayoga*. Such actions constitute *prajñāparādha* (intellectual blasphemy or errors of judgement), that is, the second source of disease etiology.[30] Forcible stimulation or suppression of natural urges, unnecessary show of strength, over-indulgence in sexual acts, negligence of the time of treatment, immodest and immoral conduct, disrespect for respected people, enjoyment of unwholesome things, engaging in conduct improper for age, time, place or situation, keeping the company of wicked folk, neglect of proper regimen, and display of negative emotions like malice, vanity, fear, greed, anger, jealousy, etc., are all instances of *prajñāparādha*. According to *Caraka Saṁhitā*, such acts which are contrary to wisdom are responsible for the aggravation of the *doṣas*.[31]

In such cases, a person's actions are devoid of intelligence, resolution and mindfulness (*dhī-dhṛti-smṛti-vibhraṁśa*).[32] When the intellect is impaired, the perception of the individual gets significantly altered. Thus, the individual views something eternal as ephemeral and a harmful thing as harmless, or vice versa.[33] When he suffers from lack of firmness (*dhṛti*) and memory (*smṛti*), he cannot restrain his mind which is, then, dominated by *rajas* and *tamas*.[34] Consequently, his impetuous, ill-considered actions are the cause of *prajñāparādha* or intellectual blasphemy.[35]

The etiology of epilepsy (*apasmāra*) is illustrative of this discussion. When the mind is overshadowed by *rajas* and *tamas*, the *doṣas* get aggravated and permeate the heart (the abode of consciousness) as well as the sense organs. Here, the *doṣas* get further aggravated suddenly by emotional states like passion, anger, fear, greed, attachment, excitement, grief, anxiety, perturbation etc. They consequently spread throughout the heart and the sense organs, and the individual falls victim to epilepsy. A *rajasic* or a *tamasic* individual is likely to suffer from epilepsy if he abandons the prescribed rules of living, such as consuming food that is impure, unwholesome, containing mutually contradictory properties, or that which has been touched by unclean hands, or if he resorts to an unhealthy regimen and improper conduct, or if he suffers from excessive debility.[36]

The third element that plays an important role in the etiology of diseases is time (*kāla*), which essentially refers to the transformation of time (*pariṇāma*), i.e., seasonal changes. The seasonal changes impact the body through the accumulation and liquefaction of the *doṣas*, each of which is affected according to the season. It is prescribed that the accumulated *doṣas* should be evacuated in the first month of spring (*Caitra*), rainy (*Śrāvaṇa*) and winter (*Mārgaśīrṣa*) to prevent the development of disorders.[37] Consequently, seasonal regimen (*ṛtucarya*) has been given much emphasis in Āyurveda.[38] In the context of *viṣamayoga* or improper utilisation of time, it is explained that if the characteristic features of any particular season manifest themselves excessively, then, this should be regarded as the excessive utilisation of time; and if the seasonal traits are contrary to the expected features (such as rainfall in winter) , then, this is an example of wrong utilisation of time, and so on.[39] If such transformation in the seasons is not taken care of, the body is likely to suffer from its consequences. Hence, *saṁyoga* or proper utilization of the sense organs, actions and time are beneficial for maintenance of health.[40]

From this discussion, we may arrive at an important inference. If the vitiation of the *doṣas* arises from one's own actions and conduct, then it essentially implies that the patient was, therefore, in a sense responsible for his own ailments. The *Caraka Saṁhitā* states that a wise man should be vigilant about his duties towards his own body like an officer-in-charge of a city or just as a charioteer takes care of his chariot.[41] Improper diet and conduct (*mithyāhāra-vihāra*) and transgression of the prescribed norms of social, ethical and physical conduct are emphasised as causative factors for the vitiation of the *doṣas*. Thus, Bhāgvān Ātreya concludes that those who do not follow a course of life conducive to the maintenance of good health, are susceptible to disease. It is incumbent upon every individual to strive for equitable utilisation of time, intellect and objects of the sense faculties but it is acknowledged that attaining it is difficult.[42]

The *Caraka Saṁhitā* states that the mind is constantly associated with *rajas* and *tamas*. In the absence of knowledge, *rajas* and *tamas*

cause all the defects.[43] Hence, the medical texts prescribe various non-pharmacological approaches for prevention of diseases, such as *dincaryā* (daily regimen), *ṛtucaryā* (seasonal regimen) to overcome the vagaries of the seasons; *sadvṛtta* (code of conduct) to control the senses, and *rasāyana* or rejuvenation therapies to overcome the effects of seasonal variations and ageing.

It is noteworthy, that the terms *asātmyendriyārtha-saṁyoga* and *prajñāparādha* do not occur in the *Suśruta Saṁhitā*. There is a discussion on *doṣa* aggravation mainly in the context of wounds but only the specific causes are mentioned.[44] Even in the context of the pathogenesis of systemic diseases like fever, it is stated that *doṣas* get aggravated due to their own specific exciting factors and periodic seasonal exacerbations but without reference to an individual's errors of judgement.[45] As a text of surgery, the orientation of the treatise differs from that of the *Caraka Saṁhitā*.

Diseases are classified as endogenous (*nija*) and exogenous (*āgantu*) depending on their nature. All endogenous disorders are brought about by *doṣa* vitiation but the second category of disorders are caused by extraneous agents, such as evil spirits (*bhūta*), poisons, falls, burns, trauma, natural calamities, spells and imprecations.[46] The texts identify a third category of disorders, which are related to mental health (*manasā*),[47] that are characterised by morbid pleasures and desires, or by distress and dejection caused by the failure to attain what is desired. Both exogenous and mental disorders are essentially the result of defects in one's own mental faculty. Hence, they can be prevented by restraining the sense faculties and avoiding *prajñāparādha* by meticulously following the rules ethical and moral conduct. The curative process is also determined by these factors. All diseases, according to Caraka, can be cured in three ways, viz., by correct knowledge, wholesome contact with the senses and seasonal normality.[48]

Exogenous disorders are also associated with the perturbation of the *doṣas*. Though they are caused by external agents, in due course, the *doṣas* are also affected. Exogenous fever is one of the eight types of fever (*jvara*) discussed in *Caraka Saṁhitā* and is considered different from the other seven types because of its specific symptoms, etiology

and pathogenesis. The etiology and symptoms of *āgantu unmāda* are different from other types of the same disorder. According to one view, this disorder arises from the effects of sinful activities of the past life, but Ātreya, the great teacher, disagrees with it and holds *prajñāparādha* to be the causative factor, particularly acts like disrespect to the gods, ancestors, *ṛṣis*, elders, etc. Hence, Ātreya says, one should not blame the gods, ancestors or *ṛṣis*, etc., for human ills are not pre-determined. It is evident, therefore, there were differing views about etiology. Popular perception about diseases being caused by the wrath of the gods, *ṛṣis*, etc., are reconciled in this manner with medical etiology. One is responsible for his miseries, and also, for his happiness. Some notions persisted and are recorded in the texts, the most common being that *jvara* (fever) is caused by the wrath of Maheśvara.[49]

Exogenous disorders which are caused by imprecations, black magic, or *bhūtas*, have a different line of treatment. The texts recommend auspicious acts and *yajñas*, which are termed *daivavyapāśraya*, along with *yuktivyapāśraya* (rational therapy). *Daivavyapāśraya* consists of chanting incantations (*mantra*), using precious stones and sacred gems (*maṇi*), performing auspicious rituals (*maṅgala*), oblations (*bali*), gifts (*upahāra*), sacrifices (*homa*), penances (*prāyaścitta*), fasts (*upavāsa*), benedictions (*svastyayana*), bowing before elders and divine beings (*praṇipāta*), and visiting to sacred spots (*gamana*).[50] Virtuous acts are the cause of happiness just as unvirtuous ones bring misery (*dharmāḥ kriyā harṣanimittamuktāstato nyathā śokavaśaṁ nayanti*).[51] The management of exogenous type of *unmāda* (psychological disorders) and fever (*jvara*), *kuṣṭha* (skin diseases) and *rājayakṣmā* (consumption) depends largely on this line of treatment. As these disorders were difficult to manage, the patient is left to seek the blessings of the gods. In difficult clinical conditions, *daivavyapāśraya* is prescribed in conjunction with *yuktivyapāśraya*, which consists of administration of drugs with proper diet and regimen.

Once the causation of disorders has been identified, it is apparent that their occurrence is preventable, as Ātreya says, if one takes recourse to preventive therapeutic measures and abstains from intellectual blasphemy and situations of unwholesome contact with the senses.

There is an interesting rider that this would be possible provided the manifestation of diseases at that time is not pre-determined (*daiva*).[52] This necessitates an understanding of how the doctrine of *karma* has been situated in medical etiology. The Brahmanical didactic texts have correlated certain diseases with wrong deeds committed in this life or in the previous life by individuals. Medical conditions like idiocy, dumbness, blindness, deafness and deformity are all believed to be caused by remnants of the guilt of the former crimes in the *Manusmṛti*.[53] According to Weiss, "The study of *karma* in the traditional Indian medical Indian system, Āyurveda, shows how conflict between fatalistic aspects of an indigenous traditional concept must be reconciled with a practical system which necessarily assumes that the course of human ills is not pre-determined."[54]

The doctrine of *karma* has been accorded much importance in *Caraka Saṁhitā* as a determinant of an individual's physical and psychological constitution. Based on the past deeds, the physique and the mind of an individual are derived from his or her physical form and mental constitution of a past life (*rūpāddhi rūpaprabhavaḥ prasiddhaḥ karmātmakānāṁ manaso manastaḥ*).[55] The differences in the physique and psyche of one's life from those of the other life are caused by *rajas*, *tamas* and the nature of the past deeds.[56] This association originates from the prenatal stage of development. The foetus is made up of four sets of the four *mahābhūtas* (i.e., *vāyu*, *agni*, *jala*, *pṛthvī*) that are derived from the mother, the father, the mother's nutrition, and the self. Out of these factors, the past deeds of the soul and those of the parents significantly influence the physical and psychological traits of the progeny and resemblance to the parents.[57] Thus, the psycho-somatic disposition of an individual depends on the characteristics and actions of the previous life.

Ātreya is of the opinion that effect of the actions performed in the previous life, is a causative factor for the manifestation of diseases.[58] However, there is a subtle distinction in the treatise between the past deeds and the deeds of this life. The effect of deeds of the previous life is known as *daiva* while that of what is done in the present life is termed *puruṣakāra*. The unrighteous deeds of the past life induce one

to diseases; if, however, they are virtuous, the individual remains unaffected.[59] One cannot escape the consequences of deeds performed in the previous life. *Daiva*, which is said to be unavoidable, eternal and having continuity, is known as fate. Diseases arising from such actions, which are termed *karmaja*, are not amenable to any therapeutic measures. They are cured only after the effects of *karma* are exhausted (*na hi karma mahat kiñcit phalaṁ yasya na bhujyate। kriyāghnāḥ karmajā rogāḥ praśamaṁ yānti tatkṣayāt।।*).[60] Suśruta uses the term *daiva* for a category of diseases that are sent by the gods or the sages when one incurs their wrath, or by the performance of harmful spiritual rites, or those disorders that are associated with destiny, fate or chance, etc,[61] but not in the sense of being pre-determined.

Weiss comments that in Suśruta's compendium, *daiva* is more directly related to the Devas in contrast to Caraka's where *daiva* is often synonymous with *karma*.[62] The effects of *daiva* are pre-determined while that of *puruṣakāra* are not as they depend on the efforts of the individual. The effects of both may be mild, moderate or strong.[63] Acceptance of the doctrine of *karma* implies that the lifespan of an individual is always pre-determined, but such a hypothesis is unacceptable to the science of medicine. Ātreya makes two postulations that effectively counteract this hypothesis. First, a weak *daiva* (actions of the previous life) can be subdued by a strong *puruṣakāra* (action during present life), and vice versa.[64] Secondly, strong *puruṣakāra* is generated by actions of the present life, such as : (i) righteous offerings and auspicious acts; (ii) administration of medicaments including rejuvenation therapies.[65] Strong *puruṣakāra* can, therefore, overcome the sins of the past deeds. "This implies that our ordinary non-moral action in proper care of health, taking proper tonics, medicines, and the like, can modify or arrest the ordinary course of the fruition of our *karma*."[66] It is interesting to observe how a popular belief is situated in the medical discourse by creating a more credible basis for it by altering it to suit the needs of the physicians.

Discussions about etiological factors throw up several instances in the texts that allude to prevailing perceptions about occurrence of diseases among the lay people and other scholars. As regards *karma* as an etiological factor in mental disorders, some scholars are of the view

that exogenous type of *unmāda* is caused by the sinful activities of the past. In the opinion of Punarvasu Ātreya, however, *prajñāparādha* or intellectual defects is the causative factor of this condition. The patient disregards the gods, the sages, the ancestors, *gandharvas*, *yakṣas*, *rākṣasas*, the preceptors, the elders, and other respectable persons. They cause mental disorders because of wrongful deeds.[67] However, he cautions, that neither of these entities afflict a person who is free from misdeeds.

naiva devā na gandharvā na piśācā na rākṣasāḥ।
na cānyē svayamakliṣṭamupakliśnanti mānavam॥.[68]

Thus, the primary causes of *unmāda* are one's own misdemeanours (*svakarmaṇā*).[69]

Sinful acts (*pāpa karma*) also cause *kuṣṭha* or various types of skin disorders.[70] Suśruta says, "It has been said that the evil acts of killing brāhmaṇas, women and noble persons, and taking riches of others, etc., produce *kuṣṭha* as a disease of sin."[71] Here, it is noteworthy that this popular perception about the disease is not stated in the discussion of the etiology of *kuṣṭha*. The stigma attached to *kuṣṭha* was particularly strong for which it earned the epithet, *pāparoga*.[72] If one died due to *kuṣṭha*, he was destined to be reborn with the same disease. Therefore, the patient suffered from terrible mental distress.[73] Besides, it was regarded as a contagious condition.[74] Another skin disorder, *kilāsa* (a type of leucoderma), was also attributed to rather dishonourable and unethical conduct, such as, untruthfulness, ungratefulness, disrespect for the gods, insult to the preceptors, sinful acts (*pāpakriyā*), etc.[75] It would not be wrong to assume that patients of such diseases suffered social ostracism. However, the patient did not suffer stigmatization in the hands of the physicians who reassured him that if he followed the therapy prescribed for him, which is a combination of diet, medicine, rituals, austerities and virtuous acts, he would be relieved of the dreaded disease.[76]

The *Suśruta Saṁhitā* mentions that some terrible kinds of foetal abnormalities,[77] limb deformities, humpback, dumbness, indistinct speech[78] were also attributed to sins (*pāpa-kṛta*). Interestingly, in the *Nidāna-Sthāna*, abnormalities of limbs,[79] humpback,[80] *ākṣepaka*

(convulsions) and *apatānaka*[81] (repeated convulsions), deafness,[82] and speech disorders[83] are recognised entirely as *vāta* disorders. The notion of sinful deeds is not attached to the aetiology of these conditions which are described as treatable. *Karma* is not given any significance in this text. In fact, Suśruta uses the term *karmaja* for a category of diseases originating in past human action only in the *Uttaratantra*,[84] to connote those diseases for which there is no evident aetiological factor.[85]

In the final analysis, both the authorities are unambiguous that all diseases, are clinical manifestation of the imbalance of the *doṣas*, even when they are caused by the fury of the gods, imprecations, spells and evil spirits. According to Suśruta, "The root cause of all diseases is vitiation of *vāta*, *pitta* or *śleṣman* only (*sarveṣāṁ ca vyādhīnāṁ-vāta-pitta-śleṣmāṇa eva mūlaṁ*), as their features can be observed (in the diseased state) and as the treatment proves successful if they are treated (on the basis of the *doṣas* concerned)."[86]

The issue of social stigma is attached with those conditions which are contagious. Skin diseases (*kuṣṭha*), fever (*jvara*), consumption (*śoṣa*), conjunctivitis (*netrābhiṣyanda*) are some of the infectious (*aupsargika*) diseases mentioned in the *Suśruta Saṁhitā*.[87] Consequently, these patients are advised to be segregated and they had to refrain from contact with others. In some instances, patients are made to go through physical suffering as a part of the treatment. It is advised that fever caused by evil spirits (*bhūtas*) should be treated by binding the patient with ropes sanctified by charms, *āveśana* (sprinkling with mustard seeds while chanting texts) and *pūjā* (hymns and making offerings).[88] The psycho-therapy prescribed for patients of mental disorders involved methods of terrorising by arranging fake attacks of fierce animals or by proclamation of threat of execution by the king.[89] Harsher methods were adopted when the initial ones did not produce desirable results. The body was subjected to considerable physical brutality. The patient was smeared with mustard oil, tied with rope and made to lie down in the sun. He was again rubbed with *kapikacchū* (*Mucuna pruriens*) or branded with hot iron rods or burnt with hot oil or water. Thereafter, he was subjected to the lashings of the whip, tied up and kept confined

to a lonely house by which, it was thought that the perturbed mind gained composure.[90]

For the successful management of any medical condition, the physician had to establish not only an accurate diagnosis but also its prognosis. He had to be aware whether the disease is in the curable (*sādhya*), palliable (*yāpya*) or incurable (*asādhya*) stage. The physician is advised time and again to take up a case only when he is assured of its treatability. Curable types may be easily amenable to cure (*sukhasādhya*) or prove difficult to alleviate (*kṛcchasādhya*). Easily curable ones respond to simple measures in a short time (*sukhasādhyaḥ sukhopāyaḥ kālenālpena sādhyate*), unlike the difficult cases.[91] The palliable disease can never be eliminated from the root. The patient survives as long as the treatment is given, but does not survive once it is withdrawn.[92] The irremediable type is not amenable to any type of treatment.[93] Thus, according to the basic principles of treatment, the enlightened physician should not take the incurable patient in hand. The palliative patient should be maintained with appropriate therapy and the curable one should be treated carefully with proper medicine leading to cure.

tratāsādhyaṁ parityājyaṁ, yāpyaṁ yatnena yāpayet |
sādhyaṁ cāvahitaḥ siddhairbheṣajaiḥ sādhayedbhiṣak ||[94]

Physical weakness, general debility and several complications implies an unfavourable prognosis.[95] Generally the prognosis of the *sānnipātika* type of any disease, which is caused by the involvement of all the *doṣas*, is not unfavourable because of the mutual contradictions involved in the treatment. The kind of general advisory for physicians stems from the fear of failure of the treatment, loss of reputation, wealth and knowledge. They would also be liable to suffer royal sanctions and punishments.[96] The *Arthaśāstra* ordains that physicians undertaking treatment involving danger to the life of the patient, without informing the royal authority should be fined.[97]

Edelstein, the historian of ancient Greek medicine analysed that prognosis was an important tool for the early practitioner. It was the primary way the doctor could establish his credentials, and at the same

time protect himself against accusations of malpractice. The ability to announce the outcome beforehand would earn him credit for the cure; he would also be able to defend himself should the patient die if he had made a negative prognosis.[98]

In case the condition of the patient necessitated a surgical procedure, the surgeon had to be very confident before undertaking any procedure. He is advised to proceed with the treatment if the manifested signs and symbols did not prognosticate death. Even though it is advised that incurable cases are avoidable, this is not true of all cases. A serious medical condition can be taken up for treatment if the patient is strong enough to withstand the therapy.[99]

A serious patient can be taken up for treatment provided he is strong (*balavant*), conscientious (*ātmavant*), resourceful (*upakaraṇavant*), and has not developed complications of loss of vitality, muscular wasting, thirst, fever, fainting, dyspnea, and other medical complications.[100] This statement brings us to another aspect of therapeutics: resourcefulness of the patient. Suśruta includes financial well-being as one of the qualities of a good patient.[101] The unavailability of proper equipment and attendant can be a cause of failure of treatment.[102] Consequently, the case should be taken in hand only if the patient is capable of meeting the expenditure.

The age and physical constitution of the patient had also to be taken into consideration before the commencement of therapeutical management especially in a surgical case. Surgery is recommended only for those who are physically and mentally strong.[103] Though the school of Dhanvantari claimed that surgery is a quick and efficacious method of treatment, the prognosis of the condition requiring a procedure was generally not favourable as the perception of risk and pain involved was considered to be very high.[104] For the surgeon, the risk lay not only in the procedure or the complication of the medical condition. Other than the skill of the surgeon, the mental disposition is an equally important factor in achieving success. Suśruta says even the curable diseases become difficult to manage in the following patients: the *śrotrīyas* (those who recite the *Vedas*), the king, women, infants, the aged, timid and weak persons, officials of the king, rogues, those

pretending to be doctors, those who conceal diseases, the poor, the miserly, short-tempered persons, persons lacking self-control and orphans. Treatment is successful only when it is done after giving due consideration to these factors.[105]

The above passage is an excellent of revelation of the practical challenges that physicians and surgeons had to face. The *śrotrīyas*, kings and officials possibly did not adhere with what was prescribed for them. Women, children, timid and weak persons did not give adequate information. Short-tempered persons and those lacking self-control would find it difficult to complete the process of treatment. The physician had to deal with not just the disease but different types of patients as well.

As we have seen, prognosis was extremely important for successful treatment and the physician had to give attention not just to the etiology and the pathogenesis of the disease but also to the patient's physical and mental constitution. Both the medical compendia reveal how some of the lay perceptions of disease are also incorporated in medical theory but with subtle modifications.The socio-cultural milieu played an important role in the development and evolution of the medical theory.

Notes

[1] R. Porter, 'What is Disease?', in R. Porter, ed, *The Cambridge History of Medicine*, New York, 2011 (6th edition), 71.
[2] Ibid.
[3] R. K. Sharma and Vaidya Bhagwan Dash (eds.), *Agniveṣa's Caraka Saṁhitā*: *Text with Translation and Critical Exposition based on Cakrapāṇi Datta's Āyurveda Dīpikā*, Volumes I-VII, Varanasi, 2007-09, Rpt. (hereafter CS).
[4] G.D. Singhal, et al., (eds. and trans.), *Ancient Indian Surgery: based on Suśruta Saṁhitā*, Vols. I-X, Delhi, 2007. (hereafter SS).
[5] *CS*, Sūtrasthāna, 11.3.
[6] *CS*, Indriyasthāna, 12.88.
[7] *SS*, Sūtrasthāna, 15.41.
[8] E.B. Cowell, ed., and trans., *The Buddha-Carita or Life of Buddha by Aśvaghoṣa*. XII.3. Accessed at https://www.ancient-buddhist-texts.net/Texts-and translation/Buddhacarita/Buddhacarita.pdf
[9] *CS*, Sūtrasthāna, 9.4
[10] *CS*, Sūtrasthāna, 1.16.
[11] *CS*, Sūtrasthāna, 1.53.
[12] *CS*. Vimānasthāna, 8.101.
[13] *CS*. Nidānasthāna, 1.5.
[14] S.K. Ramachandra Rao, *Encyclopaedia of Indian Medicine*, Vol. 2, Bombay, Popular Prakashan, 2005, (reprint), 220.

[15] Ibid, 25.
[16] Ibid, 95-96.
[17] Ibid, 30.
[18] Ibid, 220.
[19] Ibid, 61.
[20] Ibid, 178.
[21] Cakrapāṇi's Commentary on *CS*, Nidānasthāna, 1.5.
[22] *CS*, Śārīrasthāna, 1.93.
[23] *CS*, Śārīrasthāna, 1.93.
[24] *CS*, Śārīrasthāna, 2.41.
[25] *CS*, Sūtrasthāna, 11.43; Śārīra-Sthāna.1.98.
[26] *CS*, Sūtrasthāna, 11.37.
[27] Ibid.
[28] *CS*, Śārīrasthāna, 1.130.
[29] *CS*, Śārīrasthāna,1.128.
[30] *CS*, Sūtrasthāna, 11.41.
[31] *CS*, Śārīrasthāna, 1.103-108.
[32] *CS*, Śārīrasthāna, 1.98.
[33] *CS*, Śārīrasthāna, 1.99.
[34] *CS*, Śārīrasthāna, 1.100-101.
[35] *CS*, Śārīrasthāna, 1.102.
[36] *CS*, Nidānasthāna, 8.4.
[37] *CS*, Sūtrasthāna, 7.46-50.
[38] *CS*, Sūtrasthāna, 6; *SS*, Sūtrasthāna, 6.
[39] *CS*, Sūtrasthāna, 11.42.
[40] *CS*, Sūtrasthāna, 11.43.
[41] *CS*, Sūtrasthāna, 5.103.
[42] *CS*, Śārīrasthāna, 1.129.
[43] *CS*, Śārīrasthāna, 2.38.
[44] *SS*, Sūtrasthāna, 21.19-30.
[45] *SS*, Uttara Tantra, 1.15-22.
[46] *CS*, Sūtrasthāna, 20.3-4.
[47] *CS*, Sūtrasthāna, 11.45.
[48] *CS*, Śārīrasthāna, 2.40.
[49] *CS*, Nidānasthāna, 1.35.
[50] *SS*, Sūtrasthāna, 11.54.
[51] *CS*, Śārīrasthāna, 2.41.
[52] *CS*, Śārīrasthāna, 2.43.
[53] G. Buhler, trans., *The Laws of Manu*, in F. Max Müller, ed. *Sacred Books of the East*, Vol. XXV, Delhi, 1988, (riprint), XI. 53.
[54] M. G. Weiss, 'Caraka Saṁhitā on the Doctrine of Karma', in W.G.O' Flaherty, ed, *Karma and Rebirth in Classical Indian Tradition*, Berkeley and London, University of California Press, 1980, 90.
[55] *CS*, Śārīrasthāna, 2.36.
[56] Ibid.
[57] *CS*, Śārīrasthāna. 2.26-27.
[58] *CS*, Śārīrasthāna, 1.116.
[59] *CS*, Śārīrasthāna, 2.44.

[60] *CS,* Śārīrasthāna, 21.117.
[61] *SS,* Sūtrasthāna, 24.7.
[62] M. G. Weiss, op.cit. 93.
[63] *CS,* Vimānasthāna, 3.29-32.
[64] *CS,* Vimānasthāna, 3.33.
[65] Cakrapāṇidatta's commentary on *CS,* Vi.3.29-32.
[66] S. N. Dasgupta, *A History of Indian Philosophy,* Vol. II, Delhi, Motilal Banarsi Dass, 2000 (riprint), 403.
[67] *CS,* Nidānasthāna, 7.10.
[68] *CS,* Nidānasthāna, 7.19.
[69] *CS,* Nidānasthāna, 7.20.
[70] *CS,* Cikitsāsthāna, 7.8.
[71] *SS,* Nidānasthāna, 5.30.
[72] Ibid.
[73] *SS,* Nidānasthāna, 5.31.
[74] *SS,* Nidānasthāna, 5.34.
[75] *CS,* Cikitsāsthāna, 7.177.
[76] *SS,* Nidānasthāna, 5.32.
[77] *SS,* Śārīrasthāna, 2.50.
[78] *SS,* Śārīrasthāna, 2.52.
[79] *SS,* Nidānasthāna, 1.77.
[80] *SS,* Nidānasthāna, 1.54-57.
[81] *SS,* Nidānasthāna, 1.50-52.
[82] *SS,* Nidānasthāna, 1.83
[83] *SS,* Nidānasthāna, 1.85.
[84] *SS,* Uttara Tantra, 40.163.
[85] *SS,* Uttara Tantra, 40.164.
[86] *SS,* Sūtrasthāna, 24.8.
[87] *SS,* Nidānasthāna, 5.34.
[88] *SS,* Uttaratantra, 39.265.
[89] *CS,* Cikitsāsthāna, 9.82-86.
[90] *CS,* Cikitsāsthāna, 9.80-81.
[91] *CS,* Nidānasthāna, 8.33.
[92] *SS,* Sūtrasthāna, 23.10.
[93] *CS,* Nidānasthāna, 8.34.
[94] *CS,* Nidānasthāna, 2.27.
[95] *CS,* Nidānasthāna, 6.16.
[96] *CS,* Sūtrasthāna, 10.7-8.
[97] R. P. Kangle, ed., *The Kauṭilya Arthaśāstra*: *An English Translation with Critical and Explanatory Notes*, Parts I-III, Delhi, Motilal Banarsidass, 2003 (reprint), 4.1.56.
[98] V. Nutton, *Ancient Medicine*, Oxon, Routledge Second edition, 2013, 88.
[99] *CS,* Nidānasthāna, 6.15.
[100] *SS,* Cikitsāsthāna, 5.6.
[101] *SS,* Sūtrasthāna, 34.21.
[102] *CS,* Sūtrasthāna, 29.9.
[103] *CS,* Cikitsāsthāna, 25.54.
[104] *CS,* Cikitsāsthāna, 5.163.
[105] *SS,* Sūtrasthāna, 10.8.

Prameha : Conception of a Disease in Ancient Āyurvedic Texts

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"Disease is a central focus in biological and medical communities, a challenge for ontological analysis, and a concern of the utmost importance for all persons. Forming a general description, if not a definition, of *disease* that (i) accurately reflects biomedical science, (ii) is comprehensible, (iii) computable, and (iv) has attained widespread consensus, is a controversial and challenging task."[1]

The art of diagnosis of diseases is very old. We can track the roots of such endeavours in most ancient civilizations. Traditionally diagnosis involved identifying a disease from its external symptoms. Observation and examination of patients constituted the main methods as few absolute diagnostic measures were available. This required long-term exposure to the irritabilities or dysfunctions in large number of similarly afflicted patients before diseases could be identified and categorized with designative nomenclature. Pathological specifications could only be conceived later with registration of standard clinical observations in larger numbers. Quite interestingly, the extant early Āyurvedic compendia indicate prior collection of huge data of this kind which led to the identification of categories of diseases, albeit framed within the confines of ancient concepts of the body, its functions and dysfunctions.

The theoretical parameters for diagnosis laid out in the early compilations like the *Caraka* and *Suśruta Saṁhitā* point to a gradual systematization of practice-oriented premises and concepts. *Caraka*[2] proposed to approach the problem of diagnosis of diseases or *nidāna* through observation of etiology and symptoms with unclouded mind and intellect. Knowledge about the patient's condition were to be obtained through examination of general constitution, signs of

morbidity, psychological orientation, power of digestion, physical exertion and age, among other things.[3] Looking at the rational process of cognition laid out in the *Caraka Saṁhitā,* it would indeed seem that the approach to understanding diseases and the patients had been given a lot of attention. The process followed a logical sequence of perception, inference, application of traditional knowledge and analogy, exercising of doubts, ascertaining the object of knowledge, accepting uncertainty, setting up enquiry, arriving at certainty and finding sense.[4] *Suśruta* presented a more condensed and focused discourse on methodology – combining the processes of perception, visual observation, touch employing the *pañcendrīya* or five senses and interrogation of the patient's condition.[5] The *nidāna* section (nosology) of both texts discussed the etiological particularities of diseases leading to their convenient categorisations.

Recently Dominik Wujastyk has made a very significant contribution toward reviewing the concept of diseases in early India.[6] His deep explorations into several discourses on disease etiology encountered in different texts have revealed divergent strands of thought subsumed under the overarching humoral concept. This was also the opinion of J.G. Meulenbeld.[7] In a different sense, Meulenbeld's[8] major path-breaking work on a specific group of disorders known as *śītapitta* or urticaria illuminates on the evolution of clinical, diagnostic and therapeutic concepts in classical-modern Āyurvedic tradition. These previous works create a blueprint for academic research into the epistemic parameters of Āyurveda as a system.

The current article focuses on the internal history of the processes of conceptualizing and diagnosing (*nidāna*) a category of disease termed *prameha* (broadly polyuria) based on the study of some select compendia of Āyurveda, dated approximately between 1st century BCE and 12th century CE. We shall not go into the specifics of *prameha cikitsā.* However, some issues of concept and treatment would come under focus. We may point out that, unlike the *śītapitta* group of disorders, which, as Meulenbeld stated[9], was only briefly discussed in the classical medical texts, *prameha* was a commonly discussed

disease (group) from early times. The ancient trend of discussions on the nosology of this known category presents a rather distinct history of its own. Recurrent discussions in fact indicate the creation and prevalence of a set parameter of comprehension quite early. Yet, we often get glimpses of some rather divergent voices in the course of this review, which reflect major confusions raging among the physicians and scholars. But in many instances, these voices, airing preference for empiricism and clinical experience, were found to be thrust to the margins of dominant pedagogy. Most texts were ultimately found to be attempting to streamline knowledge under the set epistemic frame.

An exploration into modern-day researches on *prameha* by practitioners of Āyurveda revealed only a few which constitute attempts at analyses of the concept of *prameha*. Most repeat the conceptual frame within the set parameter while mainly proposing practicable modern solutions to diagnosis and treatment. Hardly do we observe attempts made to dig out inner conceptual underpinnings in the classical textual information. The most illuminating of these would be the article by A.R.V Murthy and R.H. Singh. The authors use the interpretative categories of disease classification based broadly on the general theory to directly address the matter of complexity in conceptualizing *prameha*.[10]

The present article proposes to walk through the developments in the concept of *prameha* through time, reflected in text after text to acquire a sense of the history of this process of conceptualisation. Interestingly enough, we note a gradual change in the general orientation of Āyurvedic compilations from 8th - 9th centuries onward, which prove to be a transitional juncture in both intellection and documentation of knowledge. Henceforth the general scholarship moved towards two distinct orientations, a) specialization on areas of medical knowledge and b) commentaries on major classical texts. Growing specialization led to narrowing down of the scope, consequently impacting the discussions on diseases in general and *prameha* in particular.

Early discourse on prameha in the *Bhela Saṁhitā*

The conceptual paradigm on *prameha*, a disease known since quite early times was discussed among different schools since the last centuries before Common Era. Among them was the *Bheḍa* or *Bhela Saṁhitā* (henceforth *BS*), which shared a similar conceptual and discursive frame with *Caraka Saṁhitā* but is much simpler in language and substantially poorer and briefer in philosophical and theoretical contents.[11] The *BS* also resonates with some concepts found in the *Suśruta Saṁhitā*. According to some scholars the original *BS* may have been composed during the vedic Brāhmaṇa period, while others consider it to be dated not much earlier than *Caraka Saṁhitā*.[12] However, the text may have got crystallized into the present form between 400 and 750 CE.[13] We choose to begin with this text[14] as it presents the simplest of all narrations on *prameha*, possibly reflecting an early stage of comprehension. The manuscript lacks some chapters from the *Nidānasthāna*, of which the sixth constitutes the "*Pramehanidānam*". Quite interestingly, we note the inclusion of a very brief chapter on categories of dysuria in the better preserved *Cikitsāsthāna*, although a corresponding *Nidānasthāna* chapter is missing.[15] This inclusion clearly indicates a budding idea about the distinction between polyuria and dysuria.

The chapter on polyuria, "*Pramehanidānam*" identified two types of *prameha, prakṛti prabhāva*, i.e., due to congenital condition, and *svakṛta*, brought about by activities of the patient. The congenital factor has been especially mentioned, stating that a person born of parents with the specific symptoms would generally inherit such a constitution. Description of the symptoms was important as this was the most visible factor for diagnosis. These comprised of unctuous, fatty, flaccid physiognomy, general corpulence and shining face coupled with the specific abnormality of disorderly urine. Sedentary habits, day sleeping, profuse intake of *śleṣmā* promoting food, for example, meat from marshy animals like cattle and sheep, milk products and jaggery, etc., were some of the stated causative factors. The body is said to gain fat which moistened the whole body as well as the bladder.[16] The set parameter of disease etiology was set within

the *doṣa-dūṣya* frame, which included derangement of *dhātu*.[17] The concept of three humours (*tridoṣa*) and three distinct categories of *prameha* arising out of the derangement of the three were discussed in brief but unorganised manner. Ten types of *prameha* were said to arise out of disorder of *śleṣmā* (*kaphaja meha*), a number which appears to be a standard and mentioned in other texts like *Caraka Saṁhitā*. The *Nidānasthāna*, however, mentioned only four of these by name. Three types of *prameha* associated with *pitta* have been mentioned next in this section.[18] Rest of the text seems to be missing. The *Cikitsāsthāna* enlisted a few more categories without designating them specifically under humoural categories.[19] Reference to *vātaja prameha* came last and only a single category, *hasti meha* or *gaja meha* was mentioned by name as the most terrible and incurable form of the disease.[20] The *BS* did not enter into details of medical philosophy, nor did it include details on metabolism, or details of organic abnormalities or malfunctions as noted in the *Caraka Saṁhitā*.

The *Caraka Saṁhitā* : setting up defining parameters for *prameha*

The extant form of the *Caraka Saṁhitā* (henceforth *CS*) ranges in date between the 1st century BCE-CE and 6th century CE, taking in the redactions made by Dṛḍhabala (500 CE or earlier).[21] The detailed investigation of the manuscript colophons and citations in later classical texts would suggest that *prameha nidānam* could have come down from the early layer of the text before redactions (1st century – 2nd century CE).[22] Although the *CS*[23] belongs to the same cognitive frame as the *BS*, it reveals more pronounced conceptual engagements covering metaphysical, epistemological and cognitive discussions on the one hand and setting up a discursive parameter for intellectual/ rational discussions on the other.[24] This laid a systemic foundation to the Āyurveda discourse.[25]

A general discursive frame for discussion on disease classification is set in the first chapter of the *Nidānasthāna*[26] which includes sections on a) *nidāna* or classification of diseases and b) *upalabdhi*, means of, acquiring knowledge about the diseases. *Upalabdhi* occurs through observation of i) *pūrvarūpa* or prodrome, ii) *liṅga* or symptoms, iii)

upaśaya or therapeutic diagnosis and iv) *samprāpti* or onset of disease. This last or onset of disease should be noted with reference to number (*saṁkhyā*), predominance (*prādhānya*), type (*vidhi*) and proportional variation (*vikalpa*) and time of aggravation (*balakāla*), etc. Such categories of observation seemed to become standardised and would be followed in other texts.

Coming to the specific concern for urinary diseases, we have noted how a budding idea about distinctions between scanty and profuse urination was cropping up in texts like the *BS*. This idea was obviously circulating among physicians. Although there is no reference to dysuria in the *Nidānasthāna* section of the *CS,* different kinds of dysuria, were discussed under the *Cikitsāsthāna* chapter on *Trimarmīya roga*[27] (*trimarma – basti*, *hṛdaya*, *śiras*). This is significant in two ways. *Basti, hṛdya* and *śiras* were without doubt considered the most important organs. Diseases located in these were all considered to share the physiological parameters and therefore treated in conjunction under one *Cikitsāsthāna* unit/chapter in consideration of this conceived importance. Discussions on all abdominal-urinary ailments were discussed jointly as problems of retention of stool, urine and flatus.[28] However, the curious fact is that *prameha*, a *basti* related disease, was not included here but treated in distinctly dedicated *nidāna* and *cikitsā* chapters. Was this because of the prevalence of an earlier tradition of *prameha* as a disease by itself? Tradition indeed seems to have been a predominant factor impacting conceptual processes.

The chapter on *Prameha Nidānam* began by explaining the general functions of the body, the *doṣa - duṣya* formula and the etiology of all diseases along with the triggering effect of the combination of the *tridoṣa*. *Prameha* was explained as referring to excessive watering or passing of profuse and frequent urine, indicating a condition of polyuria. The condition was attended by formation of abundant fluid primarily due to abnormality of the particular *doṣa*, *kapha*. The general condition for all *prameha* was described as one where blockage in urinary tubules (*vaṅkṣaṇa*) and kidney (*basti*) led to the occurrence of the disease and where excess body fluid is transformed into urine leading to polyuric condition.[29] Classification of twenty different

prameha types arising from the disorders of the three humours - *kapha*, *pitta* and *vāta* were enumerated which was roughly introduced in the *BS* too. About the nomenclature of the *vāta* categories, it was stated that the names reflected the characteristics or the symptoms of disease, "*guṇaviśeṣeṇa nāmaviśeṣā bhavanti*".[30] This formula was generic. However, the nomenclature and symptoms would vary from text to text to some extent while the enumeration of twenty types would remain constant.

The *CS* includes distinct etiological factors for the different kinds of *prameha* occurring from the three different deranged humours. The etiology for *kaphaja prameha* was mostly similar to those found in the *BS* with some new ones added on. Ten types of this category have been clearly specified by name.[31] Six *pitta* types and four *vāta* types were mentioned by specific names, keeping to the usual enumeration of twenty types. A surprising array of etiological factors, external and internal, have been described for *prameha* due to disorders of *pitta* and *vāta*. Over-consumption of hot, sour, saline, pungent, alkaline food and over - exposure to sun, over - exertion and excessively aggravated mental conditions, irregular diet etc. were stated to be the causes for *pittaja prameha*.[32] Excessive intake of astringent, pungent, bitter, rough, light, cold food and over indulgence in sexual intercourse, too much of physical exercise, fasting, injury, psychological conditions such as anxiety, recourse too often to emesis, purgation, head evacuation etc., were described to be usually responsible for disorders of *vāta*, among which we find *madhumeha*.[33] The nomenclature for most types appear different from those mentioned in the *BS*.[34] The innumerable factors indicate random physical observation based on complaints from patients leading to an extremely nebulous understanding of the physiological functions. This led to speculations of the diverse categories. On the other hand, we note a quite surprising discussion on *prameha* in the *Śirasīyamādhyāya* of the *CS Sūtrasthāna* in connection with depletion of *ojas*, a substance described as the essence of all *dhātus*.[35] The pathogenesis of *prameha* was described in a way here that indicated conception of a singular disease, *madhumeha*. However, the discussions in the *Nidānasthāna* went back to the set parameters.

The specific discussion on four types of *vātaja prameha* stated them to be incurable and fatal and related them to the larger questions of the body's constituents and functions. It is stated that when *vāt*a becomes deranged, it enters urinary channels and a) carries *vasā* (muscle fat forming lymphs) to the urinary bladder, giving rise to *vasāmeha*; b) when the *majjā* (marrow) is carried to the urinary tract it is *majjāmeha*; c) when lymph is carried to the bladder it leads to continuous excretion of urine which has been termed *hastimeha*.[36] The description of d) *madhumeha* is not very clear. Taken literally, the *sūtra* defined *madhumeha* as a condition arising out of excessive roughness of *vāyu*. The inherently sweet *ojas* was considered to get mixed with this deranged *vāyu*, turning astringent, carried to the urinary bladder and causing the incurable disease.[37] As for the clinical symptoms, the urine passed by a patient suffering from *madhumeha* was stated to be astringent-sweet, pale and rough.[38]

Relative curability in all the different humoral categories of *prameha* were stated to vary according to the combination of the *doṣa* and the *dhātu* and the mutually contradicting nature of the therapy. The four *vātaja* types were especially incurable due to the inherent contradictory quality (*guṇa*) of the aggravated *doṣa* and *dhātu* combined here, that is *vāta* and *meda*, respectively.[39] However, full clarification came later in the *Āyurveda Dīpikā*, the 11th century commentary of Cakrapāṇidatta.

As regards *madhumeha,* the theory of depletion of *ojas* clearly assumed great significance in the *CS*. In a simple reading of the *CS* text it would appear that *ojas* was understood to be the most crucial factor in human constitution. It was described as the first substance produced in the body, which, if destroyed, causes death. A special verse in the *CS* poetically described that as the bees collect honey from fruits and flowers, so *ojas* was collected by human beings (body) through *guṇas* (properties) and actions.[40] Residing in the heart, *hṛdayāśritaṁ*, it sustained life, being the essential nutrient fluid in the body, *śarīrarasasneha*. It was carried from the heart, pulsating and spreading all over the body. It was the "initial essence of embryo", *garbharasādrasa*.[41] Again in the *Cikitsāsthāna* it had been pointed out

that, of the food digested by living beings only a small portion was turned into *ojas*.[42] The discourse on *ojas*, and its depletion in connection with *prameha* would surface from time to time in most important texts revealing confusions and ongoing debates, the root of which lay in these multiple and nebulous descriptions in the *CS* itself. The major commentaries like the 11th century *Āyurveda Dīpikā*[43] and the 12th century *Nibandha Saṁgraha*[44] would contribute further to the confusion which went on unabated as pointed out by Meulenbeld in a brilliant article.[45]

The above survey reveals burgeoning concept of polyuria as a complex group of ailments, taken together and homogenised on the basis of observed dysfunctions related to the *basti* and *vaṅkṣaṇa* regions, identified by P.V. Sharma as kidney and the urinary bladder, respectively.[46] The concept of the disease remained wide open, mostly referred by clinical connotations from which a loose idea about the organic dysfunction was framed. A gradual gathering of information on patients' bodies and bodily functions is apparent, leading to the understanding of chronic secondary symptoms or complications arising out of primary conditions of *prameha*.[47] These reflect the growing level of clinical observation between 2nd and the 5th centuries CE. However, clearly enough, the conceptualizing of the different humoral categories of *prameha* appear to be problematic. One may actually wonder at the fixed numbers of categories. Was this enumeration of twenty types par for the course? Was it followed as a set *doṣa-duṣya* tradition? In fact, along with the *Śirasīyamādhyāya* discussion[48], another verse in the *CS Cikitsāsthanā* stating: "*jātaḥ pramehi madhumehino vā na sādhya uktaḥ sa hi bījadoṣāt*"[49] clearly uses the term *madhumeha* to cover all hereditary and incurable *prameha*. The singularity in terminology would indicate a budding concept of a singular *mahāroga*. Cakrapāṇidatta's commentary on this verse is extremely significant and indicative of the degree of confusion raging on *prameha –madhumeha* identification. More hints are available in the *Suśruta Saṁhitā*.[50] At the same time, the warning, "…*asādhyān prati nāsti cintā*[51] about incurable *madhumeha* would gather force with time. Presumably, this would have affected the patient community in a big way.

Suśruta Saṁhitā : Precision, clarification and disease specification

The extant *Suṣruta Saṁhitā* (henceforth *SS*), whose earliest version may have been composed sometime around 250 BCE was revised between the first three centuries CE and 500 CE.[52] The *SS* provides concise and organised exposition on the disease under study which seems to hold a more precise perception of *prameha*. The text being especially oriented to surgery, practical aspects of treatment dominated its *nidānasthāna*, which discussed very different diseases compared to the *CS*. However, as Meulenbeld especially pointed out, it did include *kuṣṭha*, *vātavyādhi* and *prameha* which were manageable purely by *kāyacikitsā*.[53] In fact, the *SS Cikitsāsthāna* includes not only a chapter on *prameha*, but also separate ones on *prameha piḍakā*[54] and *madhumeha*.[55] *Piḍakā* would require surgical interventions. But the inclusion of *prameha* was possibly ascertained as it was considered to be a prime disease. The fatal prognosis of *madhumeha* and the perception of severity associated with *piḍakā* (ulcers) could indeed have been the major reasons.

A sharper focus on differential diagnosis was also undergoing in the *SS*, which included distinct chapters on *aśmarī* (urinary calculi) in both *Nidānasthāna* and *Cikitsāsthāna*,[56] furthering the trend noted in the *BS* and the *CS* of perceiving dysuria and polyuria as distinct categories of diseases. Differential diagnosis would develop further in this direction in the *Aṣṭāṅgahṛdayam*, *Aṣṭāṅga Saṁgraha* and the *Mādhava Nidānam*. More importantly, the *SS* indicated that *sikatā meha* (*kaphaja meha* in *CS*, *SS*) and *bhaṣma meha*, an unspecified *prameha* category mentioned in the *BS*[57], were outcomes of *aśmarī*.[58] In fact, the commentaries of Ḍalhaṇa (12th century CE) and Gayādāsa (*Nyāyacandrikā*, early 11th century CE) further clarified *bhaṣma*, *sikatā* and *śarkarā meha as* complications arising from *aśmarī*, thus definitely cutting across the fixed notion of twenty categories of *kaphaja prameha*.

The chapter on *pramehanidāna*[59] covered five major heads of discussion on i) general prodromal features, ii) etiology, iii) supervening symptoms, iv) pathogenesis and v) prognosis. Although the etiology was understood similarly as in the *CS*, yet, a more focused knowledge of the organs, their functions, body constituents, different and more

precise descriptions for the processes of abnormality were offered. Two broad etiologies for *prameha* stated in the *cikitsāsthāna* were i) *sahaja* or congenital and ii) *apathyanimitta* or *ahita āhāra*, i.e., arising out of improper diet.[60] According to the *SS*, the pathophysiological process[61] for *prameha* was marked by improper mixing of the immature (*aparipakkva*) humours, i.e., *kapha*, *pitta* and *vāyu* in their *āma* (immature) stage[62] with *meda* or fatty substances, leading to derangement. The accumulated *meda* or chyle, etc. (Ḍalhaṇa later added that this would refer to other morbific matters)[63] were then carried due to this derangement through the urinary ducts (*mūtravāhisrotāṁ*) to the mouth of the bladder and got excreted.[64] This reference to immature humours is encountered in the *SS* and not in the *CS* which considered *āma* as simply a condition of *ajirṇa* or undigested food. [65] But in the *SS* it was considered as a *doṣa*.[66] Perhaps, the concept of *apathyanimitta* as etiology could be aligned with this concept. These minute and varied observations mostly arose from clinical and therapeutic experience.

The *SS* clearly seems to view the disease to culminate by stages[67], from the first stage of affliction, symptomatized by more than usual passage of urine, to severe stage with deep - seated *piḍakā* or abscess and other distressing afflictions, diagnosed as *madhumeha*, the quintessential *prameha*. *Prameha* was thus perceived as a progressive pathological condition evolving with more and more complexity. The usual categories were stereotypically discussed ending with the *vātaja prameha*, which was, as usual, pronounced as the most extreme and incurable form, in which deranged *vāyu* pressed fundamental principles like *meda*, *majjā*, *vasā* out of the body through urethra and affected the lower organs in the body.[68] Supervening symptom of *piḍakā* or abscess, briefly mentioned in the *CS*[69], was treated with more emphasis here to diagnose gravity of the disease. The final prognosis of fatality was declared on the basis of severe afflictions and occurrence of *piḍakā* or abscess in the regions of the heart, anus, head, shoulder, back or vital joints of the body.[70] Ḍalhaṇa commented that these *upadrava* or complications, actually qualified a person afflicted with severe forms of *prameha*.[71] Patients thus afflicted and suffering from

madhumeha, where *vāta* pressed all fundamental principles of the body through the urethra were declared incurable and inadmissible for treatment.[72] Moreover, it was emphasized that all types of *prameha* if not treated properly at the outset would develop into *madhumeha*.[73] Henceforth, this warning and discussions on the supervening symptom of *piḍakās* would feature in all later texts and commentaries[74] and would be employed for diagnostic convenience. Thus, even as the standard humoural pathogenesis of twenty-category *prameha* was stated down, the notion of a progressive pathogenesis for a singular disease was tentatively hinted.

The *CS* and the *SS* appear to differ substantially in the assessment of the pathogeny of *madhumeha*. While it was considered in the *CS* to be a type of *vātaja prameha*, in *SS* it was not mentioned under *vātaja prameha* at all, but stated to be the final culmination arising out of untreated or incurable *prameha*. P. V. Sharma, the notable exponent of Āyurveda proposed to identify *kṣaudrameha* (a type of *vātaja meha* in *SS*) as *madhumeha*[75] although the text never indicated this and emphatically distinguished *madhumeha* not as any sub category but as the severest form of *prameha*.[76] Again, the *SS*, unlike the *CS,* did not specify depletion of *ojas* as a condition in *madhumeha*. *Ojas* was understood in the *SS* as "*balalakṣaṇa*", the essence of all the seven *dhātus*, viz., *rasa*, *rakta*, *meda, māṁsa, majjā, lasika, śukra*.[77] The concept of *ojas* here was less confusing as it was singularly related to power or force. Derangement or abnormality of *ojas* were stated to be of three types – *visraṁsaḥ* (displacement), *vyāpad* (vitiation) and *kṣaya* (depletion).[78] *Madhumeha* seems to relate to the first and the last conditions. However, no reference was made to *ojas* in connection to *madhumeha* in the *SS*.

The earlier mentioned warning sounded in the *SS* for avoiding treatment of patients with severe *piḍakā* affliction and weak constitution[79] set an unfortunate trend of cautioning physicians in grave circumstances. Yet, the *SS* did include two separate chapters on treatment of *prameha piḍakā*[80] and *madhumeha*.[81] It seems that attempts were made at managing extreme cases with palliative treatment, for example, with mineral substances like *śilājatu* and *mākṣika*[82].This is

especially interesting as the use of minerals, other than as tonic (in *rasāyana cikitsā*), was rarely encountered in the early historic literature on Āyurveda. Two possibilities stem out from this cautionary attitude. First, there seems to have been a duality of attitude prevailing in the actual scene of treatment. Secondly, treatment with mineral substances seems to signify a tentative step towards exploration into newer domain of therapy.

A point of social interest is to be found in the way *prameha* patients were classified in the *SS* on the basis of economic status. Methods prescribed for self-healing indicated distinctions made between the rich and the poor. The excessively rich (*mahādhano*) were advised to take up strict dietary regimen and physical exertion in the form of sports like wrestling, horse riding, etc., and long walks. In contrast, the '*adhanastvabāndhavo*', poor and friendless were advised to take recourse to living in great austerity. Brāhmaṇa patients were advised to subsist on grains fallen from plants and draw chariots of other brāhmaṇa. A patient of lower social order was advised to take up extreme labouring tasks like digging wells.[83] The final prognosis at the end of this chapter, however, upsets the cart in favour of the poor. The memorable verse sets it down that there was a chance that the poor patient, observing these prescriptions of exertion could rid themselves of the diseases within a year.[84] This spells out for the ultimate reliance on empirical knowledge, which obviously saw efficacy of hard physical labour. We shall, however, note changes in this perception in later texts.

***Aṣṭāṇgahṛdayam* and *Aṣṭāṅga Saṁgraha* : attempts at theoretical standardisation and problems of diagnosis**

The conceptual paradigm on *prameha* was thus set in a frame before or by the 6th century CE. By the time we come to the last of the *Bṛhat Trayī*, the *Aṣṭāṇgahṛdayam*[85] (henceforth *AH*) and the *Aṣṭāṇga Saṁgraha*[86] (henceforth *AS*), systematization of Āyurveda was in full progress. Both texts, ascribed to Vāgbhaṭa actually present the knowledge system in ordered brevity for practical use of physicians. The composition of *AH* is dated around 600 CE or middle of the 7th century CE and the *AS* possibly followed shortly[87]. The most important contribution of

the *AH* and *AS* lay in clarifying in brief the concept of diseases like *prameha* and *mūtrāghāta*. These diseases were specified in the *AH* as originating in the lower torso as a whole, taking the ureters, urinary bladder, penis, testicles and rectum as a whole as the seat of these diseases.[88] The *AS* understood these diseases more specifically to be located in the *basti* or bladder.[89] In an extension of the trend set rolling already in the *SS*, both the *AH* and *AS* include separate chapters on dysuria, *Mūtrāghāta Nidāna*, in which discussions on *aśmarī* were included.[90] The *AH* and *AS* add very little to the information on *prameha* found in the *CS* and the *SS*. They provide brief descriptions of the categories, summarising views of the major earlier texts, indicating a stage of collation and standardisation of the relevant opinions.

The *AH* provided the best summation of the reasons for comparative prognosis on the lines already set earlier, i.e., (curability, controllability and incurability) in cases of different categories of *prameha*, pointing to - i) the specific combination of *doṣa*, ii) alignment of therapy with the specific *doṣa*, and iii) seriousness of the stage.[91] The progressive prognosis was put down in the *AH* on the lines proposed in the *SS*, stating that all varieties of *prameha* left untreated, "*kālena upekṣitā*" - would culminate in *madhumeha* and that in all cases of *prameha* the depletion of *dhātu*s would lead progressively to the severest form of *meha*, or *madhumeha*.[92] The *AS* kept to this line of thought, but went further, clearly laying down that all *prameha* should be termed *madhumeha* – "*tasmāt sarvepi madhumehaśabdena ucchyante*".[93] Most importantly, it mentioned cases of *prameha* progressively transforming from *kapha* to *pitta* and finally to the incurable *vāta* category.[94] This last prognosis in the *AS* reveals a distinct advancement on the hints already laid out in the *CS* and *SS*.

It is to be noted that the *AH* clearly followed the *SS* in keeping to the general idea of *dhātukṣaya* and not stressing upon depletion of *ojas* as the pathogenesis in *madhumeha*. The *AS*, however, clearly followed the *CS* in pointing especially to derangement of *oja* and its depletion resulting in the severity of *madhumeha*. The *AH*, added a new theory proposing two distinct pathogenic processes for

madhumeha – i) aggravation of *vāta* caused by *dhātukṣaya* i.e., depletion of tissues, and ii) obstruction of the path of *vāta* by the *doṣas*.[95] The *AS* reiterated this theory and further stressed it as the considered opinion prevalent among the learned.[96] While the nebulous concept concerning *ojas* and the proposed theory of two pathogenies kept alive the state of confusion, we may consider how the discussions in both the texts hinted at the underlying idea, already embedded in the *SS*, of the disease as almost a unitary one, whereby the categories seemed to be progressive stages.[97] So far as treatment was concerned, the *AH* specifically addressed those *madhumeha* patients who have been refused treatment by physicians, prescribing for them daily consumption of *śilājatu* in proper dosage for a total recovery.[98] The *AS* completely differed in this regard. Although prescribing a preparation of *śilājatu* as a cure for all kinds of *meha*, it did not specify the drug for *madhumeha*, nor did it offer any other cure singularly for the fatal disease.[99] The differences in the two near-contemporary texts would indicate varied treatment practisces and professional attitudes prevailing around the time.

But when it came to treating the poor, the picture was similar. Contrary to the elaborate and class-specific advice for all in the *SS* for self-healing through physical exertion, the *AH* singularly picked out the poor patients, prescribing physical exercise and austere life, offering the reason that they could not afford costly treatment.[100] The *AS* included a briefer version of the advice specifically for the poor.[101] These prescriptions illuminate the prevailing scene of medical service. On an interesting note, these texts also reveal a number of confusions encountered by the physicians in correctly diagnosing *kaphaja prameha* as distinct from categories of *vātaja prameha* bearing the same symptoms.[102] Similar confusion seems to have arisen in distinguishing between some cases of *raktapitta* (bleeding disorders due to *pitta doṣa*) and *prameha*. Here differential diagnosis (*sāpekṣya nidāna*) was specified.[103] Hence, the specified premonitory symptoms[104] as well as *upadrava* or resultant complications like *piṭikā* or ulcers[105] appeared to be of highest importance for diagnostic convenience.

Specialisation and collation: The post Bṛhat Trayī era

Scholarship in Āyurveda underwent a new development in the post 7th century CE phase, reflected in the composition of a number of texts oriented to specific aspects of medicine. This was the era which, from the appearance of the textual tradition, apparently witnessed the spread of *kāyacikitsā* and rise of professionalism in medicine. Professionals would have been hard pressed for guidance in nosology and proper diagnosis. The appearance of Mādhavakara's *Mādhavanidāna* (henceforth *MN*) or *Rogaviniścaya*,[106] a text specifically on diagnosis of diseases composed around the 700 CE,[107] probably signifies a landmark in the process. Again, its selection of standard passages from the *Bṛhat Trayī* indicates the onset of some kind of pre-modern standardization in nosology. So far as the urinary diseases were concerned, the *MN* for the first time, included three distinct chapters devoted to dysuria, i.e., *mūtrāghāta*, *mūtrakṛcchra* and *aśmarī*, apart from the chapter on *prameha*, indicating the culmination of the trend set earlier.[108] The chapter on *Prameha Pramehapiḍakā Nidānam*, however, was just a compilation of passages from the *Bṛhat Trayī*. There was no new interpretation or concept on the disease. The *MN* stuck to the original prognosis projected in the *CS* indicating hereditary *prameha* as well as *madhumeha* as incurable, adding that several hereditary diseases were likewise incurable.[109] We should note that the first text devoted specifically to therapy or *Cikitsā* (henceforth *MC*) is also ascribed to Mādhavakara. One extremely important inclusion in the *MC* was a chapter on *mūtrātisāra* (polyuria) especially in women[110], which was not found in the *MN*.[111] This is extremely significant in view of the contrary view expressed in many later texts as we shall observe.

MN emphatically repeated the *SS* warning for physicians to be wise and refuse treatment of patients suffering from incurable forms of *prameha*.[112] We did note the progressive prognosis for incurability in the *BS*[113] and the *CS*[114], and the emphatic cautioning about treating patients with critical *madhumeha* in the *SS*[115], followed by the *AH* and *AS*.[116] But the *SS* and *AH* simultaneously provided for their treatment[117] or management in minimum ways.[118] The *AS*, however, expressed

scepticism for any effective treatment[119] and the dominant tone in further texts spelt for complete refusal of treating such patients. Does this warning indicate a growing awakening to the realities of inefficacy of available treatments or was it due to a growing awareness of the need for safeguarding the status of physicians as professionals faced with difficult treatment procedures? In any case the severe nature of this warning would have come hard on the patients. This warning is not found in the two following *cikitsā* works, the 10th century *Vṛndamādhava* or the *Siddhayoga* (henceforth *VM*)[120] and Cakrapāṇidatta's 11th century work, *Cikitsā Saṁgraha* (henceforth *CCS*).[121]

The *VM* followed the pattern of disease categorisation already laid out in the *MN* while the medical philosophy was affiliated to the *Dhanvantarī* tradition. Three distinct observations made in the *VM* may be mentioned. First, unlike the *AH* which advised emesis for stronger *prameha* patients[122], it observed that some patients may get so weakened that emesis should not be applied to them[123], which illuminate on hard experience gained through practical processes of treatment and clinical observation. Secondly, specific drug preparations were prescribed for the specific varieties of *prameha*[124], indicating persistence of the twenty -categories theory. Thirdly, *rasa* or mercury and sulphur (*gandhaka*) were added to the list of minerals like *śilājatu* and *mākṣika* for treating *madhumeha* and *aśmarī*.[125] This is indicative of the gradual entry of mineral substances in Āyurveda treatment. The *CCS*, composed much later, more or less followed the same frame of discussion as the *VM*. Distinct mineral preparations – *śilājatu prayoga, mākṣika prayoga* were prescribed for *madhumeha*, claiming to free such patients and predicting a hundred years' life span for them.[126] Quite interestingly, exercise and austerity were advised for all *madhumeha* patients without referring to any class distinction.[127] Perhaps the poor fell out of the visible register of *prameha* patients by this time. Could this indicate restricted accessibility to the services of the Āyurveda physicians at the time?

The post 7th century CE medical discussions bore the same tone, barring the commentaries on the *Bṛhat Trayī,* which were the only

discursive sites where clinical, physiological and pathological optics were still included, although this was often repetitive and followed the set tradition. Discussions on *nidāna* and *śarīra* narrowed down especially after the *MN*, even in what is referred as *Laghu Trayī.* The *Śārṅgadhara Saṁhitā* (12th-13th century CE), for example, is completely devoted to *Bhaiṣajya Kalpanā* or pharmacology. The *Bhāvaprakāśa* (16th century CE), although covering a wide range of topics and methodological matters, added nothing notable to the discussions on *prameha*. Another historical development was the circulation of medical knowledge which had taken immense leap through dissemination of texts. This is remarkably evident from the circulation of Āyurvedic texts and knowledge in the Perso-Arabic world, indicated by citations of and from the Indian medical texts in the works of early 9th century Persian scholar, Alī ibn Sahl Rabban al-Tabarī[128] and the late 9th century Persian-Arabic scholar and physician, Abū Bakr Muhammad ibn Zakarīyā ar-Rāzī.[129] This trend continued to be reflected in the 10th-13th centuries Arabic catalogues on medical works.[130] On the other hand, if we look into the contemporary Classical Arabic medical texts of Zakarīyā ar-Rāzī (854-925 CE), 'Ali ibn al' Abbas al-Majusi (930-994 CE), Ibn Sīnā (980-1037 CE), Zayn al-Din Gorgani or al-Jurjani (1040-1136), Ibn Rushd (Averroes) (1126-1198 CE), we note that these contained substantial ideas about the functions of the bladder and urinary tract and the importance of the condition of urine (*Bawl*) for determining health state. Not only that, urinary diseases (*Salas al-Bawl*) and urinary infections (*warm e majra e bawl*) as well as renal calculi (*hasate kulya*) were tentatively studied and theorized about in many of these literature. However, we do not find much reflection of these studies in the contemporary Āyurvedic textual tracts.[131] We do not note any significant inclusion of medical knowledge or practices from the Arabic world into the Āyurvedic tradition till the 13th-14th centuries, when techniques like pulse examination[132] and some new medicinal substances entered into Indian tradition.

Discourses in the commentaries : Expositions, debates and confusions

The most significant phenomenon in medical pedagogy within the subcontinental horizon was the growing genre of commentary on

Bṛhat Trayī which evidently kept up the tradition of minute explanations on *sūtra*, *śarīra*, *vimāna* and *cikitsā*. Among the commentaries, we choose to look into the 11th century *Āyurvedadīpikā* (henceforth *ĀD*)[133], *Madhukośa*, the late 11th-12th century commentary on the *MN* by Vijayrakṣita and Śrīkaṇṭhadatta[134] and the *Nibandha Saṁgraha*, Ḍalhaṇa's 12th century commentary on the *SS*.[135] These contained some important explanations, insights as well as germs of confusion in matters related to *prameha*.

Āyurvedadīpikā

The main value of Cakrapāṇidatta's commentary lay in linking fundamental theories found in the different sections of the *CS* and in other texts, extant and lost. In the days of the classical texts, the practice of Āyurveda evidently encountered and addressed myriad problems in understanding the body, its functions, diseases and remedies. The *ĀD* threw much light on these matters. It explained intrinsic etiological factors including inherited conditions and metabolic disorders that led to aggravation of *doṣa* – *dhātu* and culminated in the manifestation of diseases. The concept of some fundamental principles, especially three laws of digestion were for the first time proposed by Cakrapāṇidatta intended for deeper understanding of causation of diseases. These were *Kedārikulyanyāya* or law of transmission, *Kṣīradadhinyāya* -law of transformation and *Khalekapotanyāya* – law of selectivity.[136] The occurrence of diseases due to vitiation of each of the seven *dhātu*s were explained, *prameha* being marked as occurring due to vitiation of the *meda dhātu*. It is in connection with the details about digestive processes and nourishment of *dhātu*s or tissue matter in the body that the first explanation on *ojas* was attempted in the original *CS*. Cakrapāṇidatta added on *ojas*, explaining how it was identified as the essence of the nourished *dhātu*s according to the *CS*.[137] He also cited a para from the *SS*, "*rasādinām śukrānāntam dhātunām yat param tejastat svalpojastadeva balaṁ ityuchyate*" as the final verdict by *śāstras* – *svaśāstrasiddhāntāt*![138] Cakrapāṇidatta's discussions clearly reflected the possibility of debates prevailing during his time on the issue of identifying *ojas*, especially when he stated that it was extremely difficult to comprehend the exact nature of

ojas.[139] But then he went proposing the thesis of two types of *oja*, the superior *para ojaḥ* constituted of eight drops and the *apara ojaḥ*, which was half of the joint cups of the hands or *ardhāñjali*.[140] The heart, *mahati* or *mahāmūla* was stated to be the site of the *para ojas* in the original *sūtra* while the *apara ojas* of *ardhāñjali* quantum was stated to flow through vessels attached to the heart.[141] By definition depletion *ojas* would cause instantaneous death. Introduction of the two *ojas* theory was urgently required to clarify the *CS* discourse on *madhumeha* which defined the disease as a condition where *ojas* is depleted.[142] It was necessary to explain that in spite of the depletion of *ojas,* the patient of *madhumeha* continued to live because in prameha it was this *apara ojas* and not the *para ojas* which got depleted.[143] *Ojas* was always a chimera! Something never understood in clinical form. Cakrapāṇidatta's two - *ojas* theory in *ĀD* added fuel to that confusion.[144] Meulenbeld explored the transition of the concept from the vedic metaphysical background where the idea of *ojas* was invested with supra -human notions of "….*bala*, *saha*s, and *tejas.*"[145] Its transition into a physical connotation in the living body remained shrouded in ambiguity. He especially teased out the confusions in the *CS*, its variance with the notions described in the *SS* and found the coeval thoughts around the abstracted notion in the religious texts like the *Bhāgavatpurāṇa* and finally the confusions added by Cakrapāṇidatta, remarking on the continued ambivalence to the present day.

Cakrapāṇidatta left a blazing trail in early medieval Bengal, closely followed by Vaṅgasena, author of *Cikitsāsāra Saṁgraha* and the two late 11th century composers of *Madhukośa* commentary, Vijayarakṣita and his disciple Śrīkaṇṭhadatta, as well as a host of later Ayurveda practitioners throughout the country. The confusing concept of two *ojas* too continued to baffle and complicate understanding, as pointed out by Meulenbeld.

Madhukośa

It would seem that, by the time Vijayarakṣita and Śrīkaṇṭhadatta were commenting on the *MN* in the late 11th to early 12th century Bengal,[146] not only had the original *MN* become an axiomatic text, but

the *ĀD* of Cakrapāṇidatta had evidently emerged as a critically important precursor. As the commentators of *Madhukośa* (henceforth *MK*) were from Bengal, their proximity would have brought them directly within the orbit of the *ĀD*. The *MK* chapter on *prameha* entered into lengthy explanations on etiology, symptomatic features and prognosis of *madhumeha* and all including the concept of *ojas* were understood on the set lines of the *AD*.[147] Citations and refutations throughout the discourse throw much light on the ongoing brainstorming among the physicians, but no new theoretical analysis came to prevail.

The sole historically exciting addition is found in a paragraph in the *MK* added where the original *MN* chapter on *prameha* ends (*MN* chapter 33 ends with the 35th verse). This cited a new discourse concerning *prameha* in women. Raising the theory aired by some practitioners that women were not afflicted by *prameha* since their body underwent periodical purification, Śrīkaṇṭhadatta, the author of this chapter, refuted it, stating that this was not proven by clinical observation.[148] This appears to be a completely new debate not mentioned in earlier medical literature, not even in the *ĀD.* It might be that the debate had only surfaced after Cakrapāṇidatta's time. The *MK* did not specify the sources. However, quite interestingly, a survey of near contemporary literature led us to the late 11th century text of *Cikitsāsāra Saṁgraha* (henceforth *CSS*) by Vaṅgasena[149], where we do find it pronounced that women were free from the possibility of ever being afflicted with *prameha* since their body is purified every month.[150] Perhaps the authors of *MK* were referring to professional scholars like Vaṅgasena who hailed from near-contemporary Bengal. It seems that such an opinion had spread and Ḍalhaṇa (12th Century CE) too had encountered it in his own time and negated it by pointing out that the idea was disproved by empirical experience.[151] Such debates could reflect a prevalent divide between pedagogic and practising circuits or between different schools or even between physicians with different regional affiliations. It would possibly also indicate the divide in male and female accessibility to professional medical treatment, giving rise to a lack of information. On the other hand, knowledge of

gynaecological dysfunctions or matters related to pregnancy and childbirth were very visible. So perhaps it indicates a selective focus on the female body at least in certain quarters of physicians. In fact, the refutation from Śrīkaṇṭhadatta and Ḍalhaṇa reveal some headway made in empirical knowledge around 11th – 12th centuries.

On the other hand, we note a counter case of blind following of tradition in the *MK*. This relates to the fixed numerical list of categories of *prameha* initiated since the days of *BS* and *CS*. Already intermittent questions about the validity of the twenty categories of *prameha* had made their way to the texts, as we have noted above.[152] This is further revealed in the *MK* when it commented on the possibility that larger than the fixed number of *kaphaja prameha* types were encountered by physicians, diagnosed on the basis of combinations of the observed symptoms. The text also raised the matter of the numerous different terms used for the *prameha* types in different circuits.[153] But these doubts and questions were resolved stating that no new possibility could be accepted as these were only based on assumptions (imagination). Only those that were manifest were to be accepted, by which of course the text referred to the traditional numbers. The *MK* thus opened the doors to fresh clinical inputs, albeit briefly, only to close it in favour of tradition. Here we may cite the instance of how Cakrapāṇidatta too, in the face of such a contention, had almost forced it down that the twenty types of *kaphaja prameha* were what age-old empirical observations attested, and this then was irrefutable![154]

Nibandha Saṁgraha

Ḍalhaṇa's *Nibandha Saṁgraha* (henceforth *NS*) is a landmark text after Cakrapāṇidatta's *ĀD*, especially because it ventured into fresh discussions on the body, its organs and internal chemistry. As we noted, the *NS* refuted the theory that women were unlikely to get afflicted with *prameha*, but more importantly it did so not only with reference to well-known texts but emphasised on empirical observation, "…..*etatyu na yuktaṁ, sarva tantra prasiddheḥ; pratyakṣa virodhāñca*".[155] A similar reliance on empiricism was not adopted, however, when it came to tackling the twenty categories of *prameha*.

As we have repeatedly noted, the whole endeavour to understand the workings of *prameha* had involved taking note of the derangement and depletion of *dhātu* or body essence in diseases. Thus it was important to note what *ojas* stood for, as this was the primary factor for *madhumeha* in the *CS* which was accepted in later tradition. Cakrapāṇidatta's commentary brought a thrust of attention on *ojas*. Ḍalhaṇa's commentary however, naturally provided description on the lines stated in the *SS*, enlarging on the concept of "*balalakṣaṇa*" and "*tejastadeva*" to clarify it as "*parama utkṛṣṭa*", "*teja eva tejaḥ*", "*ghṛtaṁ yathā*" "*dhātusneha ityarthaḥ*"; "*yat paraṁ teja iti yat utkṛṣṭaṁ sāraḥ*".[156] But it did not comment on the two-*ojas* theory anywhere. Kunjalal Bhisagratna thought that *ojas* was understood by Ḍalhaṇa to be constituting an element contained in both sugar and fat which was combustible.[157] P.V. Sharma translated the passage simply word by word and understood it thus -"as ghee is unctuous quintessence of the whole milk, likewise *ojas* too is the similar essence of all *dhātus*;….."[158] However, in the same *sūtra,* Ḍalhaṇa next went on to clarify that this *ojas* was not the same as '*bala*' – whereby *bala* meant load-carrying strength. *Ojas*, being essence of all *dhātus* and characterized by growth, possessed *rūpa* or form, *rasa* or taste and *vīrya*, etc. *Bala* did not possess these *guṇa*s. The commentary also stated that other treatises took *ojas* to be *rasa*, still others as circulating blood and some considered it as heat.[159] These varied concepts indicate the confusions raging around *ojas* in the 12th century.

The review

The confusion about the twenty categories of *prameha* illuminate the muddled identification of varied, confusing and often overlapping clinical symptoms into one meta -disease. One would have expected the research in Āyurveda to move towards a more focused comprehension of polyuria by the 12th century, ascertaining of *madhumeha* as a *mahāroga*, on the lines nebulously hinted in the *CS* and more clearly set in the *SS*. Murthy and Singh came to the conclusion that the entire description that we find in the classical texts on *nidāna*, *saṁprāpti*, *lakṣaṇa* and *cikitsā* of *prameha* actually define

a single disease, *madhumeha*. The nineteen other *meha*s are to be perceived as separate and constituting varied urinary dysfunctions with different etiologies.[160] Therefore, although *prameha* was initially defined as a complex category of different urinary diseases with similar external symptoms, a progressive pathogenesis for *madhumeha* came to be increasingly worked out, especially since the composition of the *SS*. With the baffling concept of multiple categories and the confusing and amorphous concept of *ojas*, which was the final etio-pathological index for the chief disease *madhumeha*, the comprehension of *prameha* was ultimately riddled with great difficulties.

In the social sphere, clinical symptoms of all categories of *prameha* spelt a kind of physical state of discomfiture that would be more conspicuous within the confines of household life. The ailment had repercussions which would be felt more tellingly as people began to live away from the open rural life into closed quarters in urban settings, a habitat of the well-to-do, engaged in non-primary sectors of economy. In fact, the major proliferation of the Āyurveda system and services, as noted from the compositions of the *CS* and the *SS*[161], came at a juncture when urbanism was growing in the upper and middle Ganga valley, stretching into the Deccan and further south and east. Thereafter the later composers of texts can also be situated within the larger matrices of complex social life in various regional spheres. Life of the urban rich fits the etiological conditions of the non-hereditary *meha*. *Prameha* was, by definition, a rich and/or idle man's disease, the wealthier class being oriented less to physical exertions and more toward rich food consumption. Again, the descriptions of treatment procedures in ancient Āyurveda texts often indicate that its services, for example in case of *rasāyana* treatment, was more oriented to the well-heeled clientele.[162] We have observed this in the case of *prameha* too.[163] On the other hand, the confusions regarding its occurrence in the female body throw light on the gendered social scope of classical Āyurveda. Woman's body was considered in ancient Āyurveda profoundly in relation to sexual intercourse, child birth and lactation, and not much more. The strong refutations expressed in the *MK* and

NS in this regard indeed come as a great surprise, which goes to show that clinical experience was still getting factored into the scope of medical concepts.

In the sphere of medical discourse, the level of comprehension of *prameha* represented in the above texts has to be assessed against the two fundamental aspects of methods observed in the texts, viz., a) clinical observation of patients which was practice-based and immediate; and b) the conceptual paradigm or theoretical frames created through documented knowledge. A few major problems affected progress in both aspects. In the first instance, the problem with *prameha* was that it was a package of multiple diseases which was not well clarified. Secondly, as we have noted, the major premises on comprehending the symptomatic etiology and pathogenesis of *prameha* were quite baffling and yet they got crystallized into what was seen as a set, well - mapped field. In fact, this complex category appeared to be conceived as an already time-tested field in the opinion of most ancient Āyurveda experts whose works we can lay our hands on. This led to a lacuna in the encouragement of fresh thoughts. Over the time the need for factoring in fresh pathological analyses or inclusion of new clinical observations receded from the main frame of pedagogic Āyurveda, to the extent that they were categorically refuted. The progress of clinically based nosology thus stood still. So far as conceptual issues of biophysiological processes were concerned, these remained unsettled within the frame of Āyurveda. These confusions continue till our times, as discussed in the articles by G.J. Meulenbeld[164] and Murthi and Singh. The whole review makes it evident that the tone of finality that we note in the texts about research on the disease *prameha* around the 11th – 12th centuries created obstacles in the way of induction of new ideas. Research, such as was prevailing at the juncture of ancient times broke away from the path of clear conceptualization of the disease. Yet, in the process, a painstaking gathering of evidence and documentation of clinical experience cannot be discounted.

Notes

[1] Robert J. Rovetto and Riichiro Mizoguchi, 'Causality and the Ontology of Disease', *Applied Ontology*, 10 (2015), 79 -105/ 79.

[2] *Caraka Saṁhitā*, Nidānasthāna, 1.3 - 13. Consulted editions: P. V. Sharma, *Caraka Saṁhitā, Agniveśa's Treatise refined and annotated by Caraka and redacted by Dṛḍhabala, Text with English Translation*, Varanasi, Chaukhamba Orientalia, Seventh edition, (3 volumes), 2001; Vaidya Yādavji Trikamji Āchārya, ed., *Carakasaṁhitā, Sri Cakrapāṇidatta viracita Āyurvedadīpikā bibhuṣita*, Chaukhamba Surbharati Prakashan, Varanasi, reprint, 2019; R.K. Sharma and Bhagwan Dash, ed., *Caraka Saṁhitā, Text with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Āyurveda Dīpikā*, Varanasi, Chowkhamba Krishnadas Academy, (7 volumes), reprint 2019. (All citations from original texts are with reference to original *sūtras* from consulted editions).

[3] *CS*, Vimānasthāna, 8. 94.

[4] Ibid, 8. 39-49.

[5] *Suśruta Saṁhitā*, Sūtrasthāna, 10. 4-5. Consulted editions: Vaidya Jādavji Trikamji Āchārya (Up to the 9th Adhāyay of the Chikitsātsthāna) and Nārāyan Rām Āchārya Kāvyatīrtha (the rest), *Suśrutasaṁhitā of Suśruta with the Nibandha Saṅgraha Commentary of Sri Ḍalhanāchārya and the Nyāyachandrikā Pañjikā of Śri Gayādāsāchārya on Nidānasthāna*, Varanasi, Chaukhamba Surbharati Prakashan, 2012 (new edition); P.V. Sharma, *Suśruta -Saṁhitā, Text with English Translation,* Varanasi, Chaukhamba Visvabharati, (3 Volumes), 2018; Kaviraj Kunjalal Bhishagratna, *Suśruta Saṁhitā, Text with English Translation,* (3 volumes), Varanasi, Chowkhamba Sanskrit Series volumes, 1998 edition.

[6] Dominik Wujastyk, 'Models of Disease in Ayurvedic Medicine', Mark Jackson, ed., *The Routledge History of Diseases*, Oxon and New York, Routledge, 2017, 38 - 53.

[7] Tsutomu Yamashita and P. Ram Manohar, 'Memoirs of Vaidyas. Lives and Practices of Traditional Medical Doctors in Kerala, India (3): Interview with Gerrit Jan Meulenbeld', *ejournal of Indian Medicine (eJIM)*, Vol. 9, No. 3, 2017, 63 - 80.

[8] Gerrit Jan Meulenbeld, *The Śītapitta Group of Disorders (Urticaria and Similar Syndromes), and its Development in Āyurvedic literature, from early times to the present day*, Supplements to *eJIM*, 3, Zuurstukken, the Netherlands, Barkhuis & University of Groningen,2010.

[9] Ibid, 333, 347 - 348.

[10] A.R. V Murthy and R.H. Singh, 'Concept of Prameha/Madhumeha (Contradictions and Compromises)', *Ancient Science of Life*, Vol. IX, No.2, Oct. 1989, 71 - 79.

[11] G. Jan Meulenbeld, *A History of Ancient Indian Literature*, Groningen, Egbert Forsten,2000, Vol. IIA, 13 - 24.

[12] R. C. Majumdar, 'Medicine', D.M Bose, S.N. Sen and B.V. Subbarayappa, eds., *A Concise History of Science in India*, New Delhi, Indian National Science Academy, 222, 258; Meulenbeld, *op. cit.*, 2000, Vol. IIA, 22 -24.
[13] Ibid, 24.
[14] Consulted edition: K.H. Krishnamurthy, *Bhela -Saṁhitā, Text with English Translation,Commentary and Critical Notes*, Varanasi, Chaukhamba Viswabharati, 2008 (reprint).
[15] *BS*, Cikitsāsthāna, 12.
[16] *BS*, Nidānasthāna, 6.2 - 6.
[17] Meulenbeld, 'The relationships between doṣas and dūṣyas: A study on the meaning(s) ofthe root murch-/mūrch', *eJIM*, Vol. 4 (2011), 2012, 35 - 135.
[18] *BS*, Nidānasthāna, 6.7 -12.
[19] *BS*, Cikitsāsthāna, 7. 9 - 35.
[20] Ibid, 7. 39.
[21] G. J. Meulenbeld, *Introduction, translation and Notes, The Mādhavanidāna with'Madhukoœa', the commentary by Vijayarakṣita and Śrīkaṇṭhadatta*, Leyden, E.J. Brill, 1974/2008a (Delhi edition), 403 -404, 410 - 413; G. J. Meulenbeld, *A History of Indian Medical Literature*, Groningen, Egbert Forsten, 1999, Vol. IA, 130 - 133; 112 - 114.
[22] Ibid.
[23] P. V. Sharma, *op. cit*., 2001; Yādavji Trikamji, *op. cit*., 2019; R.K. Sharma and Bhagwan Dash, *op. cit*., 2019.
[24] *CS*, Sūtrasthāna, 1. 41 - 63.
[25] Meulenbeld, *A History of Ancient Indian Literature, Groningen, Egbert Forsten*, 1999,Vol. IA, 10 -11; 110 -114; S.N. Dasgupta, *A History of Indian Philosophy*, Delhi, Motilal Banarsidass, 1975, Vol., II, 302 – 312, 398 -401.
[26] *CS*, Nidānasthāna, 1.3 - 12.
[27] *CS*, Cikitsāsthāna, 26.27 - 69.
[28] Ibid, 26. 5 -17.
[29] *CS*, Nidānasthāna, 4. 6 - 9.
[30] Ibid, 4.39.
[31] Ibid, 4. 10 - 23.
[32] Ibid, 4.27 - 35.
[33] Ibid, 4. 36 - 37.
[34] Ibid, 4.24 -26; 27 - 35.
[35] *CS*, Sūtrasthāna, 17. 78 - 82.
[36] CS, Nidānasthāna, 4.37; 4.38 - 46
[37] Ibid, 4.36 - 37.
[38] Ibid, 4.44.
[39] Ibid, 4.38 - 39.
[40] *CS*, Sūtrasthāna, 17. 74 -75; 17. 1 (special verse).
[41] Ibid, 30.6-11. See translations by P.V. Sharma, *op. cit*., 2001, vol. I, 237; R.K. Sharma and Bhagwan Dash, *op. cit*., 2019, Vol. I, 593 – 595.
[42] *CS*, Cikitsāsthāna, 8.41.

[43] Consulted editions: Vaidya Yādavji Trikamji Āchārya, *op. cit*., 2019; R.K. Sharma and Bhagwan Dash, *op. cit*., 2019.

[44] Consulted editions: Vaidya Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012; P.V. Sharma, *op. cit*., 2018; Kaviraj Kunjalal Bhishagratna, *op.cit*., 1998, Vol. I, Introduction, LVI - LVII.

[45] G.J. Meulenbeld, 'The Woes of Ojas in the Modern World', in Dagmer Wujastuk and Frederick M. Smith, eds., *Modern and Global Ayurveda: Pluralism and Paradigms*, Albany, State University of New York Press, 2008 (henceforth 2008b), 157 - 175.

[46] P.V. Sharma, *op. cit*., 2001, vol. I, 270.

[47] *CS*, Nidānasthāna, 4.47 -49.

[48] Ibid, Sūtrasthāna, 17. 78 -82.

[49] *CS*, Cikitsāsthāna, 6.57.

[50] *Suśruta Saṁhitā,* Cikitsāsthāna, 12.6.

[51] *CS*, Cikitsāsthāna, 6. 52.

[52] Meulenbeld, *op. cit*., 2008a, 431 - 432; Dominik Wujastyk, *The Roots of Ayurveda*, Gurgaon, Penguin Random House India Pvt. Ltd., 2001 (revised edition), 104.

[53] Meulenbeld, *op. cit*., 1999, 344 -345.

[54] *SS*, Cikitsāsthāna, 12.

[55] Ibid, 13.

[56] *SS*, Nidānasthāna, 3; Cikitsāsthāna, 7.

[57] See *BS*, Cikitsāsthāna, 7.13 for *bhaṣmameha*.

[58] Discussed in *SS*, Nidānasthāna, 3.13 – 14. For Gayādāsa's *Nyāyacandrikā* and Ḍalhaṇa's *Nibandha Saṁgraha* commentaries on these sūtras, see Vaidya Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 278 - 279.

[59] *SS*, Nidānasthāna, 6.

[60] *SS*, Cikitsāsthāna, 11.2

[61] For definition of pathophysiology and its ancient root, See Gary D. Hammer and Stephen J. McPhee, *Pathophysiology of Disease: An Introduction to Clinical Medicine*, New York, Chicago, McGraw Hill Education, 2014 (7th edition), Introduction, 1.

[62] *SS*, Nidānasthāna, 6.3. Meulenbeld translates '*āma*' as "undigested matter"; Meulenbeld, *op. cit*., 1999, Vol. IA, 75. This is discussed in the *SS*, Sūtrasthāna, 46.499 - 503.

[63] Commentary on *SS*, Nidānasthāna, 6.3; see Vaidya Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 289 - 90.

[64] *SS*, Nidānasthāna, 6. 4.

[65] In the *CS āma* is considered as a disordered condition of *atisāra* just as *nirāma* was a state free of that condition. *C*S, Cikitsāsthāna, 19.14 - 15; 42.

[66] *SS*, Sūtrasthāna, 46. 499 -501. The theory of *āma* as a *doṣa* develops in a full form in the *SS*, Uttaratantra. See Meulenbeld, *op. cit*., 1999, IA, 327.

[67] *SS*, Nidānasthāna, 6. 22 -24.

[68] Ibid, 6. 21.
[69] *CS*, Sūtrasthāna, 17. 78-89; Nidānasthāna, 4.48.
[70] *SS*, Nidānasthāna, 6.20.
[71] See Vaidya Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 293.
[72] *SS*, Nidānasthāna, 6.21, 6.24.
[73] Ibid, 6. 24, 27.
[74] *Aṣṭāṅga Ḥṛdayam,* Nidānasthāna, 10. 25 – 34*; Aṣṭāṅga Saṁgraha*, Nidānasthāna, 10.11 -12; *Mādhava Nidānam,* 33, 'Prameha Prameha-Piḍakā Nidānam'.
[75] P. V. Sharma, op. cit., 2018, 47.
[76] *SS*, Nidānasthāna, 6.24, 27.
[77] *SS*, Sūtrasthāna, 15.19.
[78] Ibid, 15.25.
[79] *SS*, Nidānasthāna, 6. 20.
[80] *SS*, Cikitsāsthāna, 12.
[81] Ibid, 13.
[82] Ibid, 13.6 - 19.
[83] Ibid, 11.11 - 12.
[84] Ibid, 11.13.
[85] Consulted editions: Annā Moreśwar Kunte and Krisna Rāmchandra Śāstrī Navre, collated, Hariśāstrī Parādkar, ed., *The Aṣṭāṅgaḥṛdaya, A Compendium of the Ayurvedic System Composed by Vāgbhaṭa, with commentaries by Arunadatta and Hemādri*, Bombay, Nirnay Sagar Press, sixth edition, 1939; K. R. Srikantha Murthy, *Vāgbhaṭa's Aṣṭāṅga Ḥṛdayam,* (3 Volumes), Varanasi, Chowkhamba Krishnadas Academy, reprint 2012.
[86] Consulted editions: Gaṇeśa Sakhārām Tarṭe and Kṛṣṇa Sāstri Devdhar, eds., *Śrīmadvāgbhaṭāchāryanirmitaḥ Aṣṭāṅga Saṁgraha*, Bombay, Ganpatkrishnaji Printing Press,1888; Dr. Pedaprolu Srinivasa Rao, *Vāgbhama's Aṣṭāṅga Saṁgraha*, *(Text with English Translation, Notes & Appendices,* (3 volumes), Varanasi, Chowkhamba Krishnadas Academy, 2008.
[87] Meulenbeld, op. cit., 2008a, 423 – 425; Claus Vogel, *Vāgbhaṭa's Aṣṭāṅgaḥṛdayasaṁhitā, The First Five Chapters of its Tibetan Version,* Wiesbaden, Kommissions verlag Franz Steiner GMBH, 1965, 9.
[88] *AH*, Nidānasthāna, 9.1-3.
[89] *AS*, Nidānasthāna, 9. 5.
[90] *AH*, Nidānasthāna, 9; *AS*, Nidānasthāna, 9.
[91] *AH*, Nidānasthāna, 10.6 -7.
[92] Ibid, 10.18 -21.
[93] *AS*, Nidānasthāna, 10.15.
[94] Ibid, 10.27.
[95] *AH*, Nidānasthāna, 10.18-19.
[96] *AS*, Nidānasthāna, 10.13.
[97] *AH*, Nidānasthāna, 10.4 -5; *AS*, Nidānasthāna, 10.6.

[98] *AH*, Cikitsāsthāna, 12. 43b - 44.
[99] *AS*, Cikitsāsthāna, 14.24.
[100] *AH*, Cikitsāsthāna, 12.36 - 37.
[101] *AS*, Cikitsāsthāna, 14.20.
[102] *AH*, Nidānasthāna, 10.40.
[103] Ibid, 10.37; *AS*, Nidānasthāna, 10.25.
[104] *AH*, Nidānasthāna, 10.22-24; *AS*, Nidānasthāna, 10.16 - 18.
[105] *AH*, Nidānasthāna, 10. 25 – 36; *AS*, Nidānasthāna, 10.20 -23.
[106] Consulted Editions: K. R. Srikanta Murthy, ed., transltd., *Mādhava Nidānam (Roga Viniścaya) of Mādhavakara, A Treatise on Āyurveda,* by Varanasi, Chaukhamba Orientalia, reprint edition, 2016; Dr. Brahmanand Tripathy, ed. & Dr. Kanjiv Lochan, translated and enlarged, *Mādhava – Nidāna (An Ancient text on Ayurvedic Diagnostics) of Mādhavakara with the Madhukoṣa Commentary by Vijayarakṣita and Śrīkaṇṭhadatta,* Varanasi: Chaukhamba Surbharati Prakashan, edition 2018.
[107] G.J. Meulenbeld, *op. cit*., 2008a, 21.
[108] *MN*, chapters, 30 – 33.
[109] *MN*, 33.22.
[110] *MC*, chapter, 63.
[111] Meulenbeld, op. cit., 2000, Vol. IIA, 67 – 68.
[112] Ibid, 33.36.
[113] *BS*, Cikitsāsthāna, 7. 39.
[114] *CS*, Nidānasthāna, 4.38; Cikitsāsthāna, 6.57.
[115] *SS*, Nidānasthāna, 6.20.
[116] *SS*, Nidānasthāna, 6.20; *AH*, Nidānasthāna, 10. 41; *AS*, Nidānasthāna, 10.27.
[117] The *Suśruta* devotes a full chapter to *madhumeha cikitsā*. *SS*, *Cikitsāsthāna*, 13.
[118] *AH*, Cikitsāsthāna, 12. 43-44.
[119] *AS*, Cikitsāsthāna, 14. 27.
[120] Consulted edition: Premavati Tiwari, Asha Kumari, eds., transltd., *The First Treatise of Āyurveda on Treatment, Vṛndamādhava or Siddha Yoga,* Varanasi, Chaukhamba Visvabharati, 2006.
[121] Consulted edition: Jivananda Vidyasagar Bhattacharyya, ed., *Cakradatta (Cikitsāsaṁgrahagranthaḥ), with Sivadāsasena's Tattvacandrikā Vyākhyā*, Calcutta, Calcutta Press, 1st edition 1872, 3rd edition, 1897; Dr. Madham Shetty Suresh Babu, ed., & transtd., *Cakradatta (Originally known as Cikitsā Saṁgraha, English Translation, with Sanskrit Textand Notes),* Varanasi, Chowkhamba Krishnadas Academy, 2019; Also see Meulenbeld, *op.cit*., 2008a, 8 – 10.
[122] *AH*, Cikitsāsthāna, 12. 1.
[123] *VM*, Cikitsāsthāna, 35.2.
[124] Ibid, 35.7, 8, 11 – 13, 14 – 16.
[125] Ibid, 35. 58 – 60, 6, 62 – 66.
[126] *CCS*, 35.54 – 56; 57.

[127] Ibid, 35.59 – 60.

[128] Max Meyerhof, 'Alī at-Tabarī's "Paradise of Wisdom", one of the oldest Arabic Compendiums of Medicine', *Isis*, Vol. 16, No. 1 (Jul., 1931), 6 – 54.

[129] Oliver Kahl, *The Sanskrit, Syriac and Persian Sources in the Comprehensive Book of Rhazes*, Brill, Leiden, Boston, 2015, 9 – 28.

[130] M.Z. Siddiqui, *Studies in Arabic and Persian Medical Literature*, Calcutta, Calcutta University, 1959, 39 – 40; M.S. Khan, "An Arabic Source for the History of Ancient Indian Medicine", *Indian Journal of History of Science*, Vol. 16, (1), 1981, 47 – 56.

[131] See discussions in, Huma Noor, Mohd. Anus Ansari, Ferasat Ali and Ashhar Qadeer, *Bawl* '(Urine) and its credibility in unani system of medicine', *The Pharma Innovation Journal* 2018; 7(11): 295-301; Arshiya Sultana, Khaleeq Rahman, Padmaja AR, 'Urinary Incontinence (*Salasal Bawl*) in Greco-Arabic Medicine: A Review', *Acta Med Hist Adriat* 2015; 13 (Supl. 2), 57-76.

[132] *Śārngadhara Saṁhitā*, *Nāḍī Parīkṣādi vidhi*, ch. 3.

[133] Vaidya Yādavji Trikamji Āchārya, *op. cit*., 2019; R. K. Sharma and Bhagwan Dash, *op.cit*., 2019.

[134] Consulted edition: Dr. Brahmanand Tripathy & Dr. Kanjiv Lochan, *op. cit*., 2018.

[135] Vaidya Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012.

[136] *ĀD* commentary on *CS*, Sūtrasthāna, 28.4.

[137] Ibid, See Yādavji Trikamji Āchārya, ed., *op. cit*., 2019, 175 – 177.

[138] *SS*, Sūtrasthāna,15.19, cited in *ĀD on CS, Sūtrasthāna*, 28. 4, see Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 177.

[139] *ĀD on CS, Sūtrasthāna*, 17. 73 – 75.

[140] *ĀD on CS, Sūtrasthāna*, 30. 6 – 7, see Jādavji Trikamji Ācharya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 184 – 185.

[141] Ibid.

[142] See *CS*, Nidānasthāna, 4. 37.

[143] *ĀD* on *CS*, Sūtrasthāna 30. 6 – 7; see Yādavji Trikamji Ācharya, *op. cit*., 2019, 185.

[144] Meulenbeld, *op. cit*., 2008b, 157 – 175.

[145] *Ibid*, 159.

[146] Dinesh Chandra Bhattacharyya, 'New Light on Vaidyaka Literature', *IHQ*, 23 (2), 1947, 123 – 155; Meulenbeld, *op. cit*., 2008a, 22-26

[147] *MN, Madhukośa*, 33.23 – 26, Tripathy, *op. cit*., 2018, 553 – 554, 542.

[148] *MK* additional discussion, 33.36; Dr. Brahmanand Tripathy, *op. cit*., 2018, 558.

[149] *Vaṅgasena Saṁhitā or Cikitsāsāra Saṁgraha of Vaṅgasena*, (2 vols), by Nirmal Saxena,Chowkhamba Sanskrit Series, Varanasi, 2004; Sri Jivananda Vidyasagar Bhattacharyya, ed, *Śrīvaṅgasena Saṅkalita Cikitsāsārasaṁgraha*,

Calcutta, Siddheswara Press, Superintendent, Free Sanskrit College, 2nd edition, 1893.

[150] *CSS*, *Pramehanidāna*, sutra, 23.

[151] *Nibandha Saṁgraha* commentarial addition on *SS*, Nidānasthāna, 4. 3.

[152] *SS*, *Nidānasthāna*, 3.13 – 14. See Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, *op. cit*., 2012, 278 – 279 citing the commentarial opinions of Ḍalhaṇa and Gayādāsa in *Nibandha Saṁgraha* and *Nyāya Candrikā* respectively.

[153] *MK* on *MN*, 33. 7-12; Tripathy, *op. cit*., 2018, 545 -546.

[154] *ĀD* on *CS*, Nidānasthāna, 4. 23.

[155] *ĀD* citing *SS*, Nidānasthāna, VI.3, Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, ed., *op. cit*., 2012, 289.

[156] *NS* on *SS*, Sūtrasthāna, 15. 19.

[157] Kunjalal Bhisagratna, *op. cit*., 1998, Vol. I, Introduction, LIV – LVII.

[158] P.V. Sharma, *op. cit*., 2018, Vol. I, 165.

[159] *NS* on SS, Nidānasthāna, 15.19, Jādavji Trikamji Āchārya and Nārāyan Rām Āchārya Kāvyatīrtha, ed., *op. cit*., 2012, 71; P.V. Sharma, *op. cit*., 2018, Vol. I, 165.

[160] See Murthy and Singh, *op. cit*., Oct. 1989, 74, 78.

[161] Meulenbeld, *op. cit*., 1999, 112; 336 – 337; Meulenbeld, *op. cit*., 2008a, 403 – 404, 431 – 433.

[162] This is observed when the *CS* offered professional advice on *kuṭipraveśika* treatment of *rasāyana cikitsā*. *CS, Cikitsasthāna,* 1. 27 –28.

[163] *SS*, Cikitsāsthāna, 11.12; *AH*, Cikitsāsthāna, 12.36 – 37; *AS*, Cikitsāsthāna, 14.20.

[164] Meulenbeld, *op. cit*., 2008b, 157 – 175.

An Illustrated Ophthalmic Register of an Arogyasala in Serfoji II's (1798-1832) Thanjavur: An Emblem of Plural Medical Practices

Tutul Chakravarti and Ranabir Chakravarti

Preliminaries

The complex heritage of Indic civilization, celebrated for its longevity and liveliness over millennia, gains particular relevance when studied in the context of the history of science in the subcontinent. First, this underlines the interactions between human and natural/physical sciences as an intellectual exercise. The inherent interdisciplinary nature of this kind of enquiries is particularly captured in the realm of the history of medicine in the subcontinent from the remote times to the colonial past. Second, this is a relatively new and burgeoning sub-discipline within the broad rubric of the subcontinent's history.[1] While the great contributions of the indigenous Ayurvedic and Unani traditions of medical knowledge, theories and practices have been duly celebrated,[2] perhaps the most spectacular historiographical advances are seen in the study of the emergence of 'modernity' in medical knowledge and pursuits in the subcontinent from the 18th century onwards, clearly as the outcome of the massive influences from Western sciences and technologies, including medical sciences, exerted on India by various European trading companies. This is especially significant for the English East India Company that from the second half of the 18th century transformed into a colonial ruler. The vast and voluminous records of the European companies, especially the English East India Company (EEIC) records, will bear out how the subcontinent was reduced to a 'periphery' by the

dominant, advanced and superior colonial power with its metropole in Britain.

The 16th and the 17th centuries are noted in the subcontinent's history for growing maritime trade between the Indian Ocean and the north Atlantic, resulting in the inflow of numerous facets of Enlightenment from the West to the subcontinent. That paved the way for the advent of 'modern' scientific, rational concepts in the subcontinent profoundly impacting the so-called 'traditional' concepts of nature, science and the universe. The dominant narrative from the colonizer's perspective is the account of the massive leap forward in scientific knowledge in the deep-seated traditional, inward-looking, superstitious, stagnant and religious temper of the subcontinent. The surge of nationalism in India from the late nineteenth century onwards, on the other hand, began to claim that many of the achievements of the Western sciences had already been anticipated in nascent forms in pre-modern times; if there was a decadence in scientific thoughts and practices during late pre-colonial India, traditional scientific ideas could be reformed and reinvigorated by drawing upon Western sciences. The postcolonial studies have, on the other hand, tried to highlight the impacts of Enlightenment scientific ideas as a 'discourse of power' that appropriated many indigenous concepts of the subordinated colonies. In other words, attempts have been made to recover the indigenous elements in the heydays of 'colonial sciences'[3]. This has immensely benefitted the history of medicines during the early colonial times which are said to have experienced plural medical practices and not a simple Western domination over medical pursuits in India.

II

The Subject

This overview of the paradigmatic shifts in the study of the history of medicine in colonial India helps us situate a unique register of ophthalmic cases related to a hospital, *Arogyasala*, in Thanjavur (Tanjore), in Tamil Nadu during the time of a local ruler Serfoji II (1798-1832). Serfoji II, the last of the Maratha ruler of Thanjavur, was

actually a puppet completely under the control of the English East India Company. The uniqueness of this hospital register lies in the fact that it contains 43 detailed case-histories of ophthalmic patients who received treatment at the said *Arogyasala* (literally a healing house). The most outstanding features of this unique document are a) the meticulous recording of the patient data (including their admission and discharge records), b) descriptions, diagnoses and treatments (both therapeutic and surgical) of the eye-diseases and c) several sheets containing coloured illustrations of the diseased eye(s) before and after the treatment. This kind of maintenance of the hospital record is not associated with the traditional indigenous medical system and method. The register was prepared mostly by Dr. John Mack, Assistant Surgeon of Madras Eye Infirmary, who spent some time in the Thanjavur hospital built by Serfoji II.[4] Our discussions on this intriguing subject will address the following issues: i) the ongoing process of interactions with Enlightenment and medical epistemology reaching Tamil Nadu through the Coromandel coast, obviously riding the high-tide of mercantilism, ii) the co-existence, but not without asymmetry, of indigenous medical knowledge and practices with Western medical sciences in Tamil Nadu/ South India, iii) the role of Serfoji II and his court in the accommodation of the plural medical practices, iv) a detailed analysis of the hospital register of ophthalmic patients and v) the evidence of plural and/or hybrid medical knowledge and practices in the early colonial times.

A distinctive feature of this essay is the emphasis on the treatment of various eye diseases which do not figure prominently enough in the early colonial records where the thrust was on the control of illnesses like cholera, scurvy, gonorrhea etc. The availability of both traditional Indic medical systems and the Western/European therapeutic facilities at Thanjavur strongly suggests that it had emerged as a 'centre' of circulation and reception of Occidental medical sciences, though it was lying at the 'periphery', vis-à-vis the metropole.[5] Thanjavur's proximity to Madras, especially the EIIC administrative headquarters at the Fort St. George,[6] obviously facilitated the flow of

European medical knowledge and practices in the Kaveri delta area. No less significant is the close interactions between Serfoji II's court and the Danish Mission at Tranquebar which was another major site of the surfacing of Enlightenment ideas through the Halle German Mission.

III

The Beginning of the Encounters in Medical Sciences from the West

Following Deepak Kumar it is possible to demonstrate that colonial authorities were intent upon interventions into the local medical systems of the colony with the primary aim of the extension and consolidation of the colonial power. He however also factors in the generative roles of individuals and institutions, within the colonial framework, with evangelical, philanthropic and economic fervour.[7] Besides the obvious Enlightenment spirits of enquiries and establishing scientific causality of the unknown natural phenomena in the vast non-European spaces during the heydays of global maritime commerce, there were inevitable encounters with different ecological, climatic zones and therefore, various diseases. This necessitated, for instance, the compulsory presence of physician-surgeons on board the ships sailing out from England to Asia and the Tropics from 1745 onwards. Medical chests with drugs and equipments, duly certified by the Surgeons Company Hall, London were also indispensable items on board the voyaging ships.[8] The EEIC and other European trading companies too (eg the VOC), however, were acutely aware of the burden of expenses for carrying and providing medical facilities to the far-off colonies. The inevitable result was a process of acquisition of the knowledge of local medicines and healing practices. Inseparably associated with this is the emergence and promotion of hybrid knowledge, produced by negotiation, contestation and connections between the colonizing centre and the colonized periphery.

One of the earliest instances of this is the 16th century recognition by Garcia d'Orta of the presence of local physicians (*vaidyas*) in Portuguese-dominated coastal societies of India which utilized the

expertise of these healers.[9] More celebrated example of the same is the production of the *Hortus Malabaricus*(Amsterdam,1678-93) on the 742 plants and herbs of Malabar – offering enormous natural wealth and therapeutic resources— by Hendrik van Rheede, the Dutch Governor. But this knowledge could have hardly been acquired and produced but for the signal contributions from Itti Achuden, the Ezhava physician (*vaidyan*) of the downtrodden Thiyya community, whose ethno-medical knowledge was further endorsed by three brahmana scholars (Ranga Bhatt, Vinayak Pandit and Appu Bhatt). The copper plate engravings and illustrations of the Malabar plants were done by a very large number technicians and illustrators and these were firmly embedded in European systems. This is, however, not a case of keeping European Enlightenment epistemology and the indigenous knowledge on equal footing in this monumental and pioneering knowledge-production at the colonial centre. The prevalent indigenous scientific and medical knowledge was 'distilled and reformulated' in such a way at the European centre that there were barely noticeable traces and trails of any epistemic semblances of either Ezhava and/or Ayurvedic knowledge in the final production of this monumental treatise.[10] The inherent asymmetry between the colonial metropole and the colonized periphery would lead to the appropriation of the indigenous knowledge through the agency of 'Green Imperialism'.[11] It is therefore no wonder that in the late 18th and early 19th century in South India, especially Madras, indigenous therapeutic options were available and in circulation, but which would be recorded in colonial/official records as 'bazaar medicines' from the native black town.

IV

Serfoji II, His Court and Thanjavur as a Centre/Site of Hybrid Medical Practices

This takes us to the locale of Thanjavur, the court of Serfoji II. Although past its great glories as a premier political citadel and a cultural/sacred centre during the first half of the second millennium,

Thanjavur was noted in the 18th and 19th centuries for its particular painting style. Like Madras it also was served by two ports, Nagapattanam/Negapatam and Saluvanaickapattanam, the latter being the ship-building yard for the Thanjavur rulers.[12] We have already highlighted its close interactions with the Danish/German Mission in the coastal town of Tranquebar.

Out and out an inept and titular ruler at the mercy of the EEIC, Serfoji II, however, was avidly interested in Western sciences, including Western medical sciences, as he himself suffered from some acute ophthalmic diseases. Soon after ascending the throne, he was quite keen on learning about eye diseases. Serfoji II came into close contacts with the Physician General James Anderson of Madras through his handsome donation to the Native Hospital in Madras. This was followed by his taking regular lessons on anatomy from the Residency Surgeon, William Somervell Mitchell. He was on a procuring spree of the-then latest works and illustrated textbooks (e.g. Cullen's *First Lines of Practice of Physic*; John Bell's *Bones, Muscles and Joint*; Charles Bell's *Surgical Observations*, *A System of Operative Surgery*; *System of Dissection* and *A Treatise on Disease*). These exposed Serfoji II to the 'dissecting gaze' at the human body, now available in printed forms in multi-layered accounts, accompanied by naturalistic coloured illustrations of the invisible insides. But the most striking points of his knowledge-acquisitions were 1) a 'prepared body of a child', courtesy the Head of the Tranquebar Mission and 2) an artificial eye—an apparatus, completely dissectable, to explain the application of spectacles.[13] The first item unequivocally demonstrates that Serfoji II, in spite of being a strict Saiva, was able to transcend the centuries old taboo against touching and handling a corpse, totally proscribed in the caste-ridden society. Further, the first dissection of a human body in India in 1805 took place at Madras; this preceded by three decades the more famous instance of the first dissection of the body by a native medical student in the Calcutta Medical College. However, the caste taboos were still influential on Serfoji; he was yet not prepared to procure and touch a human skeleton. Therefore, he first sought for a skeleton made of

ivory, but eventually settled for a wooden model of human skeleton (manufactured in England). There is thus little wonder that his court would be visited by the German physician Simon (1799). Surgeons Thomas Sutton of Madras and Macleod accompanied him during his pilgrimage to Benares (1822-24) when the ruler himself carried a European medical chest during the journey.

This is however not a narrative of unilateral, unidirectional and one-way flow of Enlightenment concepts on medical knowledge and practices. The Thanjavur court was thronged by several indigenous practitioners, expert in Ayurvedic and Tamil Siddha systems. Ramaswamy Iyer, Velayudha Kaviraiyar, Subbarayar Kavirayair, Kottiyur Sivakozhunthu Desikar are only some cases in point. His court also promoted Unani practices by renowned *hakeems*, like Kader Khan, Rahim Khan, Amir Khan, Haji Ahmed and Mamoon Saheb. In the specific context of the treatment of ophthalmic diseases must be mentioned Appu Sastri and Heera Khan. An outstanding physician was Tattwa Pillai, equally adept in Ayurvedic, Tamil Siddha and European medicinal knowledge and practices. He was the royal physician; there are documented proofs that women of the royal family invariably preferred Tattwa Pillai to the readily available European doctors to examine them during their illness. This was largely on account of their bowing to the traditional proscription against exposure to an alien person. That Tattwa Pillai treated the Danish and Eurasian patients in Serfoji's ship-building yard at Saluvanaickapattanam eloquently speaks of his formidable professional skills.[14]

V

The Illustrated Case Sheets of Ophthalmic Patients

At this juncture we would like to delve into the central issue of our essay, namely the unique Thanjavur *Arogyasala* register containing illustrated case sheets of 43 patients. These records were written during August to October, 1827. The Thanjavur hospital register leaves behind handwritten 48 case history sheets, using Iron gall ink with illustrations of the diseased eyes (38 of these written in English) of the patients.

The unique aspect of the hospital register in these findings is in a few coloured drawings of patients' eyes before and after ophthalmic treatments and surgery. Our personal on-site viewing and examination of these unique illustrated case sheets of ophthalmic ailments and treatments amply bore out that the register was excellently maintained; there is little fading of both the handwritten texts and the coloured illustrations. Recording was done there with meticulous care regarding a) the name, age and gender of patients; b) the date(s) of their first and subsequent visits, c) the date of the discharge of patients and d) also the patients who did not return to the *Arogyasala* in spite of having been advised by the physician to do so for further treatments. Before proceeding further into these cases, it is plainly visible that the system and method of generating and keeping accurate records of patients in a particular hospital is hardly an indigenous procedure; there is no precedence of keeping patients' diagnostic and therapeutic records in the Indic, especially Brahmanical, traditions strongly upholding the Sruti-Smriti system. Since it is well known that Dr. John Mack, Assistant Surgeon of the Madras Eye Infirmary was active in the Thanjavur *Arogyasala* during this time, it is likely that the register owed its creation to this English doctor.[15] We shall return to this subject later; there is thus little doubt about the introduction of European/ British method of keeping hospital records to this *Arogyasala* at Thanjavur.

The strong influence of European/British system in the treatment of the ophthalmic diseases is clearly evident from the writing of these case sheets, from page 8 to page 43, in English. Of these pages written in English 18 sheets also carry coloured illustrations of the patients' eyes.

This is another unique feature of the system of keeping treatment records in that the written diagnoses and treatments were accompanied by accurate coloured drawings. These drawings of patient's eye explained the nature of the disease; both the eyes were drawn and each anatomical part, like eyeball, conjunctiva, cornea, lens, was drawn with anatomical precision to explain which part of the eye was afflicted.

The illustrations also suggest the extent of improvement of the diseased eye(s) after treatment. Interestingly enough, the illustrations of the diseased/treated eye(s) are presented at the top of the sheet. Then follow all the written statements on the diagnoses, the course of treatment, the results of the treatment at the time of the visits by the patient on appointed day(s). In other words, the illustrations at the top were almost like the synopses of the case-sheets in writing (fig.1: a typical example of the ophthalmic case note). The dovetailing of the illustrations with the written case-histories of the ophthalmic patients is a startling aspect of this document.

Starting with the diagnosis of the ophthalmic diseases, these records contain the minute personal details of the patients, including their personal habits. We find ophthalmic terminologies like conjunctiva, cornea, capsule of the lens, anterior and posterior chamber in patients whose age ranged, according to the sheets, from 3 to 60 years. A close perusal of the case-sheets would reveal that the most common conditions were cataract and glaucoma. That surgeries were performed to remove the cataract is amply clear from the elaborate treatment, recorded in the case-sheets (fig. 2: illustrated sheet of traumatic cataract with follow-up details). The term for this particular cataract surgery in the case-sheet is the employment of the needle (fig. 3: another record of cataract treatment of a 53 year old male; fig. 4: coloured illustration of cataract). At least in one case sheet it is categorically stated (with an asterix and written at the bottom of the page) that the surgery was performed in the presence of the His Highness, i.e. Serfoji II himself. The status of their vision and post-operative improvements were all carefully recorded in these sheets. For medical/therapeutic treatments of non-surgical ophthalmic ailments the regular application of medicines like silver nitrate, belladonna, chalk powder and peppermint water was made and duly entered in the case-sheets. The frequent use of leeches for blood-letting to reduce congestion and inflammation is also quite prominent in the register; similarly, regular was the prescription for purgative (*jalap*/*jolap* written in English). The patients' names figuring in the case sheets bear hardly any European/

British names; their names underline that they hailed from local indigenous society. Put differently, the beneficiary of the medical facilities, recorded in the case-sheets, were local people. That there were female patients too visiting the *Arogyasala* will be borne out by the names like Mary, Lachhmi, Subbalakshmi and Jijabai. Most of the patients bore Tamil names, though Jijabai was likely to have been a Marathi woman. Patients' names like Samuel, Mary and Kader Khan underline that ophthalmic treatments were offered to patients cutting across religious/sectarian affiliations.

The medicines prescribed for treatment came from Dhanvantari Mahal which functioned both as a pharmacy and a dispensary. This will be evident from the fact that Dhananvantri Mahal also had an *Aushadha Kothadi* (pharmaceutical store). Both Indian and European medicines were used, indicating thereby the plural medicinal traditions and practices. Documentary evidence reveals that stringent tests on medicines had been made before these being prescribed. That indigenous medicines for the Dhanvantari Mahal were supplied from the Black Town (bazar medicines) of Madras is available from the available documents of the *Arogyasala*. The strict and regular watch over the quality of drugs in the Dhanvantari Mahal was under the supervision of leading indigenous practitioners like Babu Vaidyar, Jagaund and Tattwa Pillai. The re-organization of the *Arogyasala* is known to have been undertaken by Thomas Sevestre. While an English Ophthalmologist, Dr. MacBean figured prominently in the register, the local physician of no lesser eminence was one Amrithalingam Pillai. The above images effectively capture the plural medical knowledge and practice in Thanjavur in the early 19th century.

That ophthalmology received considerable emphasis and attention in the overall field of therapeutic and surgical treatments in Tanjore is thus beyond any doubt. In this context it must be noted that in the city of Madras was established in 1819 the famous Eye Infirmary. This is the oldest hospital dedicated to ophthalmic treatments not only in India but also in the whole of Asia. The Madras Eye Infirmary is only the second of its kind, the first being the Moorefields Eye Hospital in

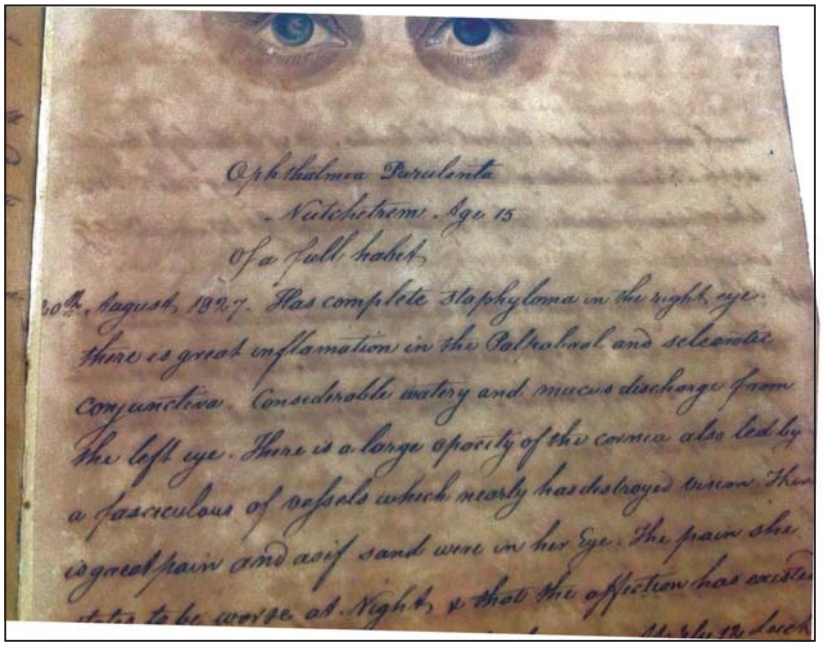
London, which was founded in 1805. Though an aside and an unconnected event, it is tempting to recall that the Napoleonic invasion of Egypt in 1798 was beset with immense suffering by the French troop from Ophthalmia; the problem was so acute that it required the setting up of a hospital in Cairo as a large number of the French soldiers were at least temporarily incapacitated. As Egypt was also the theatre for the military operations of British and Ottoman forces during the period from 1801 to 1805, these two armies too faced similarly acute problems of Ophthalmia and Trachoma. This resulted in the delivery of specific ophthalmic services for soldiers.[16] How European warfare in alien lands gave rise to serious health issues and the resultant medical interventions will be amply borne out by these events, more or less coinciding with Serfoji II's presence at Thanjavur.

A word on the coloured drawings of diseased eyes may be in order here. The immaculate drawings in colour of the eyes diagnosed and treated, found in the Thanjavur *Arogyasala* case-register, were prepared on the principles of European Naturalism in art. Naturalism in art refers to the visual capture of realistic objects in a natural setting. It is a type of visual art that pays attention to very accurate and precise details, and portrays things as they are. Naturalism or representational art looks recognizably similar to something in the real world. We observe the influence of eye diseases on pictorial art in these drawings. The artists drew and painted images of people with eye diseases, including entropion, ectropion and squint. This is also something unique with the understanding of Ophthalmic diseases in India. Those who actually prepared these illustrations are unknown and unnamed. As this illustration is distinctly of a different genre from the well - known contemporary Thanjavur paintings, it may not be impossible that these illustrations drew upon European Naturalistic drawings, techniques and idioms. These could have been done by professional European/English painters who regularly travelled to far-off destinations as European companies and states began to expand rapidly to non-European countries. On the other hand, one may not entirely rule out the possibility that indigenous artists could have

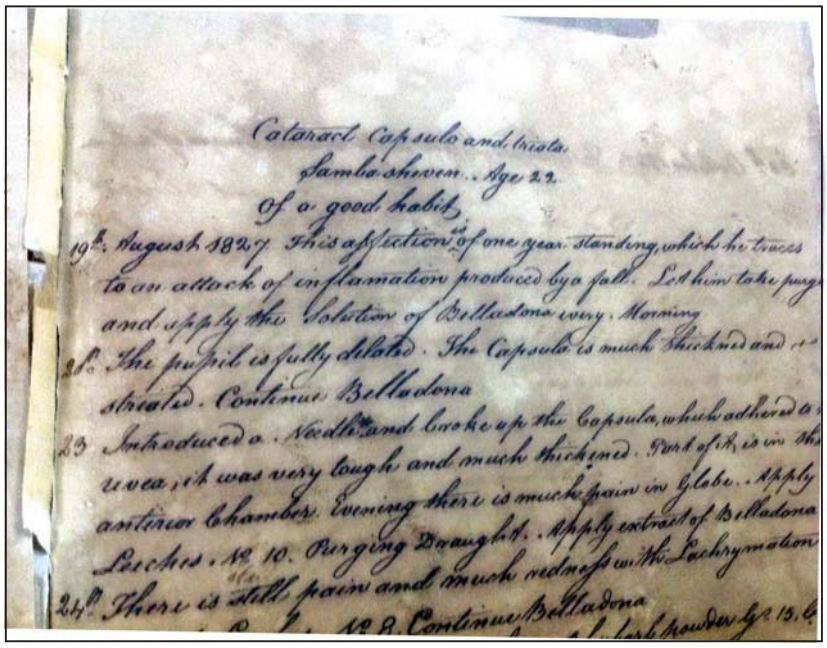
been trained by professional European/English painters to produce these immaculate images of diseased and treated eyes.

We would like to round off this discussion by taking a close look at the first seven sheets of the ophthalmic register at the Thanjavur *Arogyasala*. These initial pages, very much part of the said register, are however, different from the succeeding pages — from 8 to 43 — — on several counts. First, these pages have no English language recording of diseases and treatments; these were written in Marathi language and in Devanagari script. Second, there is no elaborate and meticulous recording of diagnoses and treatments with specific dates of visits by the patients and the date of their discharge in the Marathi sheets. The statements in the first seven pages are extremely brief merely giving the names of the patients and those of the treating doctors. There is a solitary instance of the recording of the age (*varshe*) of the patient as 45 years.

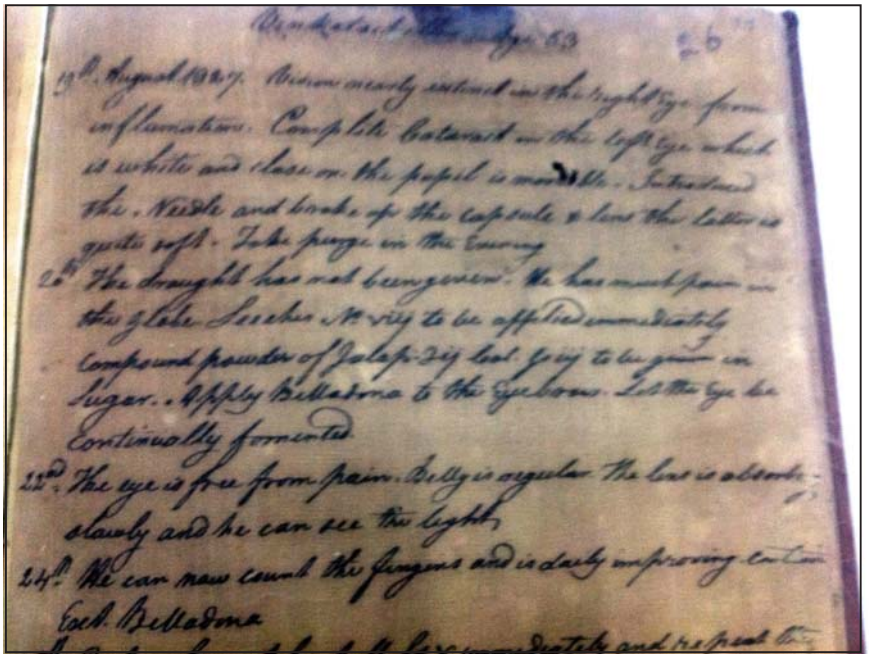
No less striking is the fact that these sheets consist of coloured drawings of the diseased and the treated eyes (fig. 5: coloured illustration of a diseased eye, treated by the physician Hussainallima Khadri). These illustrations are not of the excellence that one sees in the similar drawings accompanying the sheets written in English. It raises a pertinent question. Were the coloured drawings prepared by indigenous illustrators on their own or prepared under the instructions and guidance of the English/European doctor or a Western technician? It is difficult to give a firm and definite answer to these questions. But these were apparently the initial attempts to illustrate the case-history sheets with accompanying coloured representations. The names of the patient also reveal occasionally, but not routinely, their professions: thus one encounters there a mariner/sailor (*navika*) and two soldiers (*sipahi*: fig. 6 : coloured illustration of Adherent Leucoma of a *sipahi*, treated by Anjeer Khan). The attending doctors, according to the first seven sheets in Marathi, were Mastana and Anjeer Khan, who were father and son respectively and therefore engaged in the medical practice hereditarily. These were evidently Muslim doctors. The third Muslim doctor figuring in the Marathi sheets was Hussanalima Khadri.



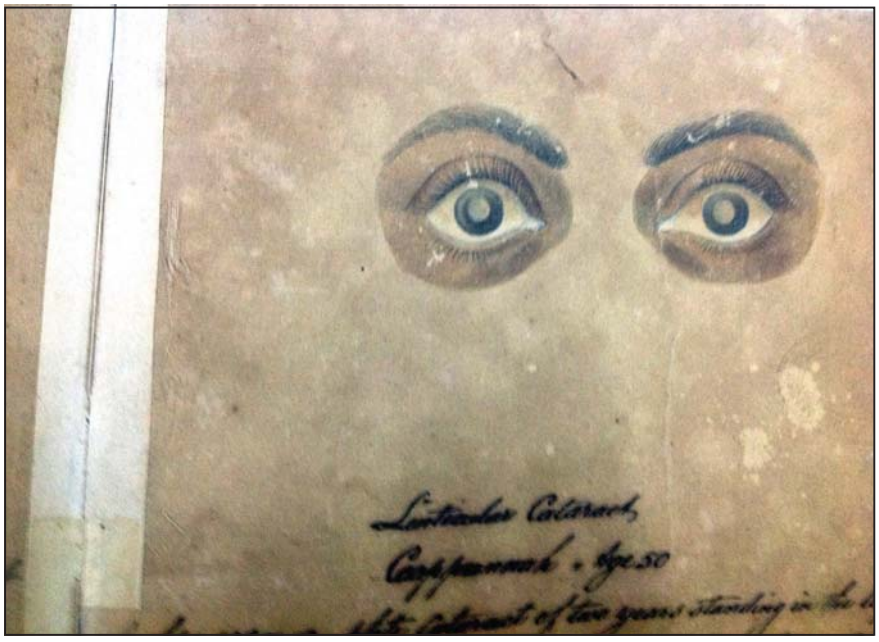
(Figure 1)



(Figure 2)

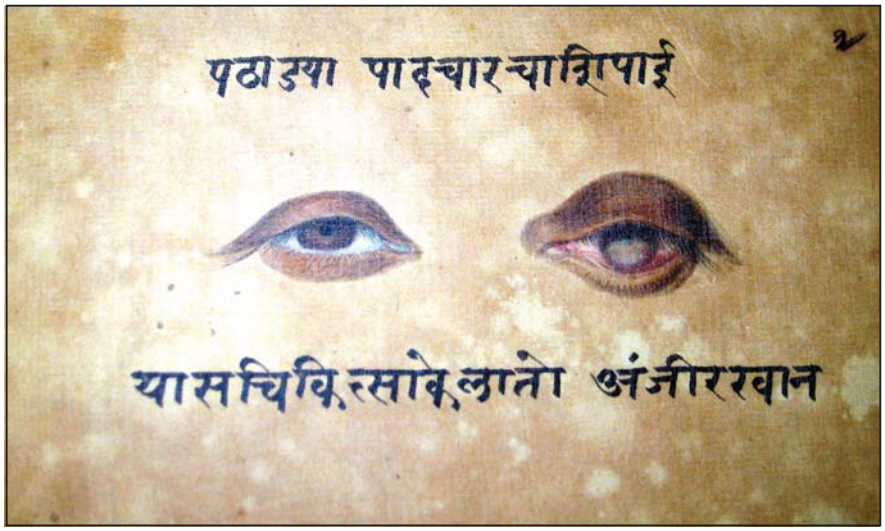


(Figure 3)



(Figure 4)

(Figure 5)



(Figure 6)

All three doctors apparently were practicing Unani medicine. The celebrated physician Tattwa Pillai, already mentioned in a previous section, also figures in one of the sheets as the attending physician. Another physician treating eye-diseases is Linga Pariyari who was known as the barber-surgeon. The suffix Pariyari may reflect upon his extremely low status of a *paraiyah* in the caste-ridden Hindu society. It is well known that barbers (*napitas*) often performed surgeries for rural and poor patients; their so called impure work was the ground for the Brahmanical society to scorn and ostracize the barber as one of the *jatis* of the lowest social ranks. It is interesting to note that a barber surgeon treated patients in a king's *Arogyasala* in early 19th century.

These first seven pages offer a mine of information regarding the social history of medicine, medical practices and practitioners. Written in a non-European language and script and providing names of indigenous doctors (who are not known by names in the English sheets) these sheets are quite distinct from the forms and contents of the succeeding 35 pages. At least the first attempts to offer names of local patients and their indigenous doctors (the word *chikitsa* is invariably written in these sheets) along with coloured drawings of diseased eyes are to be located in the initial seven pages. The succeeding recordings and depiction in the later 35 sheets are of course more refined, orderly and systemized; but sequentially at least the English pages follow the sheets in Marathi. The accommodation of these pages into an ophthalmic case-register, primarily written in English language during the active presence of John Mack of the Madras Eye Infirmary, itself speaks of and celebrates hybridity of medical knowledge and its application in Thanajvur of the early 19th century.

Acknowledgement

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Notes

[1] For the integrated and inter-related approaches to the study of the history of medicine in India see Deepak Kumar, 'HISTEM and the Making of Modern India', *Indian Journal of History of Science*, 50, 2015.

[2] Apart from the celebrated Sanskrit treatises like the *samhitas* attributed to Susruta and the Charaka, epigraphic records too bear testimonies to early Indian medical practices. See Ranabir Chakravarti and Krishnendu Ray, 'Healings and Healers: Epigraphic Bearings on Healing Houses in Early India' Occasional Paper, 30, Institute of Development Studies Kolkata, 2011; for the overview of the Unani medicine vide, the online *Britannica* article on Unani Medicine.

[3] These issues have been addressed in Joseph S. Alter ed., *Asian Medicine and Globalization*, Philadelphia: University of Pennsylvania, 2005.

[4] Savithri Preetha Nair, *Raja Serfoji II, Science. Medicine and Enlightenment in Tanjore*, London: Routledge, 2012, 40.

[5] Ibid, 15-40; also Nair, 'Native Collecting and Natural Knowledge (1797-1832), Raja Serfoji II of Tanjore as a "Centre of Calculation", *Journal of the Royal Asiatic Society*, XIX, 2005, 279-302.

[6] Nupur Dasgupta, 'Health Concerns, Medical Substances, Exchange Networks in Early Colonial Fort St. George (1700-1850)', in Kenneth R. Hall, Rila Mukherjee and Suchandra Ghosh, eds., *Subversive Sovereigns across the Seas: Indian Ocean Ports-of-Trade from Early Historic Times to Late Colonialism*, Kolkata: Asiatic Society, 2018, 186-215.

[7] Deepak Kumar, 'Health and Medicine in British India and the Dutch Indies: A Comparative Study', in Alter ed., *Asian Medicine and Globalization*, 78-87.

[8] Nupur Dasgupta, *op. cit.*, 2018.

[9] M.N. Pearson, 'Hindu Medical Practice in Sixteenth Century Western India: Evidence from Portuguese Sources', *Portuguese Studies*, XVII (Homage to Charles Boxer), 100-15.

[10] Malvika Binny, 'Plants, Power and Knowledge: An Exploration of the Imperial Networks and the Circuits of Botanical Knowledge and Medical Systems on the Western Coast of India against the Backdrop of European Expansion', *Global Histories*, I. 1, 2015, 3-20.

[11] R.H. Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism*, Cambridge: Cambridge University Press, 1995; Grove, 'Indigenous Knowledge and the Significance of South-west India for the Portuguese and Dutch Construction of the Tropical Nature', *Modern Asian Studies*, XXX, 1996, 121-43.

[12] The continuity of Nagapattanam as a port in the late 17th century is borne out by two inscriptions of 1658 and 1676, first discussed by K.A. Nilakantha Sastri in the light of its strong ties with the VOC. Vide K.A. Nilakantha Sastri, 'Two Negapatam Grants from the Batavia Museum', in idem, *South* India *and Southeast Asia*, Mysore: Geetha Book Store, 1980: 197-212. also see

Ranabir Chakravarti,' Coasts and Interiors of India: Early Modern Indo-Dutch Cross Cultural Exchanges', in Thomas da Costa Kaufmann and Michael North eds., *Mediating Netherlandish Art and Material Culture in A*sia, Amsterdam: Amsterdam University Press, 2014, 95-110.

[13] Tutul Chakravarti and Ranabir Chakravarti, 'Visuals of Spectacles in the Mughal Miniature Paintings: Eye Glasses and the Correction of Vision', Occasional Paper, 38, Institute of Development Studies, Kolkata, 2013; this work however does not dwell on the treatment of vision in Thanjavur.

[14] This section heavily draws on Nair, *Raja Serfoji* II; some information regarding the situation in Madras is derived from Dasgupta, *op. cit*., 2018.

[15] This unique Opthalmic case register has already been discussed by some ophthalmologists. S. Prema, 'Eye Diseases in Traditional Siddha System of Medicine—an Overview', *Indian Journal of History of Science*, 44.2, 2009, 323-32; Jyotirmay Biswas, Basanthi Badrinath, Sengamedu S. Badrinath, 'Ophthalmic Contribution of Raja Serfoji II (1798-1832)', *Indian Journal of Ophthalmology*, 670.4, 297-300

[16] Max Meyerhof, 'A Short History of Ophthalmia during the Egyptian Campaigns of 1798-1807', *British Journal of Ophthalmology*, March 1932, 129-52.

Environmental change, health and disease in Bengal's western frontier: Chotanagpur between 1800-1950s

Sanjukta Das Gupta

Human intervention in transforming the natural environment and its resultant ecological changes plays a large role in the emergence of infectious disease and is particularly evident in the unprecedented human-induced global environmental changes during the contemporary geological period of the Anthropocene.[1] The effect of one's environment in the outbreak of disease and epidemics have been long studied by scholars.[2] In fact, the link between climate and the prevalence of disease in the tropics, as well as its supposed impact in debilitating the local population, had been discussed at length by European scholars since the 17th and 18th centuries. Just as human beings can alter places, so can alterations in the landscape affect human bodies.[3] We may refer, for instance, to the transmission of new diseases into relatively-isolated ecological zones by migrating populations and the exposure of native populations, who lack acquired or inherited resistance, to unknown pathogens.[4] In recent years, there has been considerable research on histories of medicine in India which address wide-ranging issues contestations and negotiations between 'Western' and 'Indian' medical practices, the treatment of epidemics, women's health, British colonial medical policies and the history of medical institutions. However, the links between environment and health as well the medical history of people living in the margins have remained under-researched.[5] This paper investigates the relationship between environmental change and disease in eastern and central India with reference to the Chotanagpur Division and Santal Pargana districts which once formed part of the Bengal Presidency under British colonial

rule, and which are today incorporated within the Indian state of Jharkhand.

Taking a long-term view spanning the early 19th century and the 1950s, the paper explores some of the changes affecting the landscape of the plateau zone between the plains of North India and deltaic Bengal since the 19th century. In particular, it analyses the manner in which the spread of rice cultivation and the reduced forest cover, the construction of railways and multi-purpose river valley projects refashioned the natural landscape and brought about changes in the means of livelihood among the people of the region, and eventually led to the phenomenon of widespread hunger. Secondly, it provides an overview of the diseases prevalent among the Adivasi/tribal population in Chotanagpur and Santal Parganas and examines in this context colonial beliefs regarding the racial implications of disease. Thirdly, it analyses the factors behind the increased incidence of malaria in the southern and eastern parts. Finally, it looks at the proliferation of disease in the overcrowded urban settlements with references to an epidemic in the mining town of Jamshedpur where new employment opportunities attracted people from all over the country.

Changing landscape and polity in Bengal's western frontier

Located in the eastern end of the Deccan plateau where it merges into the plains of Bengal, the Chotanagpur constituted an environmentally heterogeneous region.[6] For long described as 'Jharkhanda' or the land of forests, it stood as a frontier zone between the fertile plains of south Bengal and the middle Gangetic basin. The diverse landscape made for varied spatial polities and forms of social control over landscapes.[7] Since the 8th century onwards, both northern and southern parts of Chotanagpur saw the rise of feudatory rulers who colonized the region through land grants and introduced or strengthened Brahmanical Sanskritic culture in the region.[8] The process gathered momentum in the 17th century with increasing pressure on land as the region came to be drawn into the Mughal sphere of

influence.[9] This was accompanied by the slow intrusion of a Hinduized peasantry from the north as the local rulers commenced the practice of granting service tenures upon their retainers. With the extension of settled cultivation, the forests were gradually converted into arable lands, particularly around the centres of regional authority in northern Chotanagpur in Hazaribagh, Ranchi and Palamau. Although the rulers of the petty kingdoms in Chotanagpur tended to preserve the forests as a protective shield against invasions by neighbouring powers[10], forests in the northern parts had begun to shrink long before the advent of the British, thanks to the extension of the agrarian frontier. The south, however, remained densely forested well into the 19th century.

The landscape thus consisted of a hilly, forested terrain interspersed with cultivated fields and a hot, dry climate with low rainfall for most parts of the year. The variations in the climatic conditions and topographies generated multiple livelihood patterns, agricultural patterns and belief systems.[11] By the end of the 18th century, however, settled agriculture had come to prevail among the dominant indigenous communities, like the Mundas, Hos and Oroans, some of whom had already been absorbed within the revenue-collecting apparatus of the local kingdoms and inhabited the open, fertile spaces in the plateau which had been cleared of forest cover. Since the swift-flowing, seasonal rivers and streams traversing the district were not of much use for irrigation of the uplands, cultivation of lowland rice remained rain-dependent, while the local peasantry devised various means to counter the problem of water shortage in the uplands. For instance, the Mundas and Oraons in the Ranchi region had evolved the method of terracing ridges into fields of various sizes in a step fashion along the contour lines.[12] Small, temporary embankments were constructed across the bed of a stream which allowed water to be stored high up on the slopes. This was, in fact, also a common practice in Dhalbhum, Hazaribagh, Palamau and the Santal Parganas where the villagers erected tanks and *bandhs* for irrigation. Although useful in years of average rainfall, these could not be relied upon to prevent

food shortage in case the rains failed. The worship rituals of the indigenous people and their propitiation of mountain gods demonstrate their very real anxiety concerning annual rainfall.

However, the agricultural communities rarely depended only on rice cultivation for survival. Together with settled cultivation, these communities also practiced various forms of shifting cultivation in the upland, forested areas where hardy grains, requiring little irrigation, were grown. Smaller communities, living in more inhospitable areas, combined shifting cultivation with food gathering, hunting and trade in forest produce. Thus, in pre-colonial times the 'tribal' economy of the region was characterized by the interdependence between forest and agriculture. Food gathering and hunting were integrated with various forms of cultivation[13] and, as Vinita Damodaran has shown, these local food strategies helped to minimize starvation and hunger in years of drought.[14] This interdependence was thus crucial for their socio-economic life as it enabled a livelihood, which, although precarious, could ensure subsistence in the context of low population density. The landscape, moreover, shifted constantly between forest and pasture. The margins distinguishing them were often blurred, with clearings reverting to forest on being abandoned.

A significant change that occurred during the colonial period was the sedentarization of the indigenous people, particularly the larger communities, through curbs on shifting cultivation and through control over their intra-regional migration. Till the mid-19th century, British colonial rulers laid greater emphasis on clearing forest for cultivation. As a result, extension of cultivation was noted in almost all the districts controlled both by indigenous landlords and the colonial government. As P.P. Mohapatra has shown, the extension of the agrarian frontier was accomplished both through the reclamation of new land as well as through intensive cultivation of uplands and wastelands, which were gradually embanked and converted to rice lands.[15] As a result, the upland cereals were replaced by lowland rice, which required greater amount of water than the hardy upland crops. By the end of the 19th century, rice had become by far the most important food

crop in Chotanagpur and there was an increased demand for rice both internally, because of the influx of non-Adivasi peasantry, and from the external markets which resulted in the increased grain trade from the region. However, since agriculture remained rain-dependent, the shift to rice cultivation proved to be environmentally unsustainable as even a local failure of rains resulted in large scale crops failure. The net result was an increasing incidence of famines under colonial rule.

The intensification of agriculture in the uplands was accompanied by restricted access to forests since the last two decades of the 19th century, when demarcating and reserving portions of the forest for exclusive government use was taken up in earnest. The Forest Act VII of 1878 limited forest use all over India, effectively closing parts of the forests to the indigenous people. Restrictions on the use of forests also affected the traditional agricultural practices of the tribal people as large upland areas were placed out of reach of ordinary cultivators.[16] Thus, as the geologist Valentine Ball noted,

> People living in jungle villages are more independent and less affected by famine than those who reside in the centre of cultivation and have no access to jungles. Were a census to be taken it would probably be found that the relative proportion of deserted houses of villagers as a result of famine to those still inhabited is greater in the open cultivated area than in the dense jungle ... indeed the jungles can be regarded as the saving of the lower races of the population.[17]

Since these forests lay in mineral-rich zones, the opening of mines since the second half of the 19th century further limited access to the forests. British rule thus brought about the separation of forest and cultivation, initiating an end to their complementarity in the regional economy.

Food scarcity and hunger

Agricultural production in Chotanagpur therefore remained uncertain under colonial rule and the region became prone to famines

whenever the rains failed. Food scarcity and large-scale hunger was thus a new attribute of the British colonial period. Between 1866 and 1918 there were at least five major occurrences of distress and famine conditions in Chotanagpur, the most acute being the famine of 1897.[18] Severe droughts in the first half of the 19th century, as in 1866, had not caused famines or high mortality as the tribal subsistence economy could draw sustenance from forest produce, but from the mid-19th century, famine and hunger became endemic in Chotanagpur. Even a partial failure of rainfall affected agricultural conditions while rainfall deficiency spread over a few successive years led to acute distress. Chronic food shortages had also led to increased incidence of epidemic diseases, particularly cholera, in the region.

The enfeebled state of the people can be seen in the official memo of the Chotanagpur Commissioner in course of the famine of 1915-18 in Kolhan Government Estate:

> The crowds collected at Jagannathpur and Barbaria were the worst specimens I saw. At each of these places I inspected about two thousand persons of whom at least 60 per cent were more or less severely emaciated and at least 15 to 20 per cent so reduced as to be obviously incapable of doing a full day's task on a relief work. The state of the old men and women, cripples, beggars and others who were in receipt of gratuitous relief was worse; in many cases they were merely skin and bone. The children too in the neighbourhood of these two centres were showing all their ribs and looked listless and uncared-for. I heard however of only three cases of actual death from starvation, and the Hos as a race must possess great powers of resistance to famine conditions. I saw many of them in a state of emaciation which would have meant a collapse in the case of an average Beharee cultivator.[19]

The dependence on rice and limited access to forests also had a long-term effect upon the diet and health of the people. Furthermore, forest restrictions also impeded the age-old practice of combating disease by seeking refuge in the forest on the outbreak of epidemics.

Although hunting had been a major livelihood activity of the tribal people even during the early colonial period, restrictions imposed by the Forest Act effectively deprived the tribal people of a major source of protein in their diet. As the *Singhbhum District Gazetteer* noted, by the end of the colonial period, the diet of an average villager consisted only of rice and a small quantity of vegetables, and protein was virtually unavailable to the common man.[20] The low calorific intake naturally debilitated the people, making them more vulnerable to disease.

Jungle fevers and the question of immunity

The reshaping of the landscape and livelihood patterns in Chotanagpur had a direct impact upon public health in the region, leading to the establishment of medical surveillance systems. In this, however, a racial categorization of vulnerability to disease came to be established, and the region was deemed to be especially dangerous for the non-indigenous population, whether Indian or European.

British writings of the 19th century gives an account of the diseases which were found in Chotanagpur, descriptions which were strongly influenced by current scientific debates on health and environment as pre-conditions for certain races to acquire specific traits. In the early years of British intrusion, the tribal villages were found to be clean and healthy. The British military officer, Lt. Col. S.R. Tickell, for instance, described the Hos – who lived in western Singhbhum district, located in the south-western part of Chotanagpur – as being more free from any disease than others in India on account of 'the precautionary measures they take – their nutritive food and drink, and the open airy positions they build in as a guard against infection or fire, their villages are small and scattered …'.[21]

On the other hand, he found other parts of Singhbhum district to be annually 'scourged by cholera, fevers and smallpox'.[22] The spread of smallpox during the mid-19th century was attributed to 'Brahmin inoculators' – i.e. outsiders who flocked into the region following British conquest – rather than being a natural phenomenon of the

district. A new disease, it created havoc through a virulent spread in the district in 1839 which coincided with the introduction of the vaccine, which thus was believed by the tribal people to have been the chief cause of the outbreak. However, despite small outbreaks of smallpox every year, the death rate was not very high except in 1866, and again in 1902, when famine conditions prevailed over large parts of the region. The latter epidemic caused 3,294 deaths, which represented 5.36 per thousand of the population.[23] A similar epidemic occurred in 1903 in the Santal Parganas when 2.986 people died, i.e., approximately 1.6 per thousand of the population.[24]

Less spectacular than smallpox, but more potent as a killer disease were the dreaded 'jungle fevers' of the region. Valentine Ball who carried out a geological survey in Chotanagpur in the mid-19th century succumbed to these from time to time despite taking all preventive measures.[25] The tribal people of Chotanagpur were observed to have been relatively free from these fevers. This was explained both in terms of their resistance to disease as well as to the precautionary measures they took in living apart from each other and fleeing to the jungles at the first appearance of any epidemic and returning only when it was considered safe.[26]

In fact, the tribal lands were seen to be a danger to all but the indigenous people of the region, with Indians from the plains also succumbing to the fevers. Comparable accounts were reported from other parts of the plateau region as well. Thus Captain W.S. Sherwill, a surveyor in the Santal Parganas had noted that 'the hillmen' (i.e. the Paharias) and the Santals appeared to suffer little from this fever. On the other hand, he observed that, 'To the natives of the plains the climate of the hills during several months of the year is most fatal; jungle fever carrying them off in a few hours […]. [The] first high wind arising in March is the messenger of death to the natives of the plains. I have seen seven of my servants struck down in one day with fever'.[27] In the mid-19th century, therefore, immunity to disease was believed to have been a racial characteristic. This perception would be revised in the early 20th century when the immunity to malaria came to be understood as the outcome of repeated exposure to the disease.

As the link between disease, climate and landscape came to be established in the European scientific discourse of the mid-19th century, emphasis on the causal relationship between health and environment became a common feature in British narratives on Chotanagpur. The cool climate on the uplands of Chotanapur, (Chotanagpur) especially in winter, often eulogized as being akin to the British climate, attracted British officers who sought respite there from the relentless heat and oppressive humidity of the Indian plains.[28] But the unpleasantly hot summers held forth the threat of disease and death. For instance, British troops cantoned at Hazaribagh found themselves succumbing to the frequent bouts of enteric fevers in the region. Despite the reputed salubrity of its climate, the hill-station had a death rate of 19.15 per thousand during the years 1860-69, as against the Bengal Presidency rate of 29.98.[29] There was again a recurrence of typhoid fever among the British regiments in February 1874. The disease was confined to the regiment, and did not appear to have affected either the European civil and military residents nor the indigenous population and the Madras sepoys.

The origin and propagation of enteric fever afflicting the British regiments was traced to the 'poisoning of air, drinking water, or … decomposing excrement' by some British doctors who pointed out that the disease affected mainly the young and attributed its outbreak to 'climate' acting upon unacclimatized youths. That typhoid chiefly affected adolescents was a well-established fact both in India and in England where had been shown that about three-fourths of the fatal cases in the London Fever Hospital were under 25 years of age. The detractors of the 'climate theory' included Dr. Frederick J. Mouat[30] who argued that the risks surrounding European life in India did not very materially exceed those which affected longevity in Europe. Emphasizing the fact that typhoid caused mortality for only a small percentage of young soldiers and that it seldom affected the European civil officers in India, *The Indian Medical Gazzette* proposed the 'dirt hypothesis' which considered contamination of the barracks and the soil to have been the main factor behind the outbreak.[31]

Other than the jungle fever, the common diseases in Chotanagpur included dysentery and cholera. The latter disease assumed a particularly virulent form towards the end of the 19th century in the densely populated northern parts, particularly in Palamau which had witnessed a massive influx of non-tribal migrant population in course of the century. The district records showed that cholera epidemics to have occurred regularly at intervals of two to three years, with serious outbreaks in 1892, 1894, 1897, 1900, 1903 and 1907.[32] The worst epidemic occurred in 1894 when the death rate rose to an unprecedented 11.16 per thousand.[33] In tune with the 'dirt hypothesis', the reason for the frequent outbreaks of epidemics was traced to 'filthy, sodden villages, and a water-supply polluted in every possible way'.[34] Furthermore, the weekly bazars held in the large villages brought together a large crowd of people exacerbated the situation, while rice fields were contaminated by cattle droppings. This was in marked contrast to earlier practices when tribal villages were rarely extensive owing to their aversion to congregate in large numbers for fear of fire and contagious diseases.[35] Yet, over the years, these simple health precautions had to be abandoned in view of constant encroachments on their land by outsider migrants.

In the early years of the 20th century, racial segregation of Europeans and the tribal population was advocated as a preventive measure for malaria, especially in the new mining settlements in southern Chotanagpur. As Nandini Bhattacharya has shown, the world-wide research into malaria between 1902 and 1930 drew attention to the enormous variety of types, as well as breeding habits, of the vectors which tended to flourish in different terrains. As a result, the question of identifying the local causes became a crucial one in the first half of the 20th century.[36] The prevalence of malaria in the Bengal Iron Company's mines at Singhbhum was studied by S. R. Christophers, the Director of the Malaria Bureau of India. In his report of 1923, he argued for the segregation of the European residents together with the skilled non-tribal labour force who he believed were more susceptible to malaria. The unskilled mine workers, on the other

hand, were drawn from the 'aboriginal' communities and were believed to be fairly immune to malaria.[37]

As Bhattacharya has shown, although Christophers did not believe in the racial propensity to disease, he underlined the fact that certain 'races' did acquire immunity thanks to their exposure to the infections, thereby providing a new twist to the racial theory of disease.[38]

Infrastructural development and spread of malaria

A further change in the 20th century was the increasing incidence of malaria even among people who were earlier seen to have been immune from 'jungle fevers'. The link between the spread of malaria and the changing ecology of colonial India together the changes within the colonial economy, including the expansion of the railway network, the construction of canals and embankments and commercialization of agriculture, has been demonstrated by scholars like Sheldon Watts and Ira Klein.[39] The construction of the Bengal Nagpur Railway running across the forests of Chotanagpur which facilitated the influx of non-tribal peasantry and labourers greatly exacerbated the outbreak of malaria in the region.

Between 1906-1927, there took place sustained research into malaria in India had led to the preparation of a 'malaria map' by the malariologists S. R. Christophers and J.A. Sinton in 1926. As Paul Russell of the International Health Division (IHD)[40] of the Rockefeller Foundation noted, the route map of the Bengal-Nagpur railways, when superimposed on Christopher's malaria map of India, revealed that considerable portions of the railway lines ran through highly malarious country.[41] Around 25 species of anophelines had been traced along the Bengal Nagpur Railway. The latter had employed a full-time malariologist in the 1930s to tackle the problem and 25 distinct control projects were set up at stations along the railway. The control work, which was done on anti-larval lines, was found to be successful by Rockefeller Foundation observers. Since the cost was too much for the rural communities, it was borne by the railway company as part of their business expense.

The breeding grounds along the railway tracks included *nullah*s, paddy fields, sunlit pools, wells, sluggish streams, irrigation channels and also seepage. Wet fallow rice fields with clear water were the chief menace, while rice fields with muddy waters were discovered to be less dangerous. Thus, the larva did not breed areas where the cattle were strong enough to plough the hard, dry fields prior to planting just before the rains. This was because the rainwater became muddy because of the loosened soil. But where the poor quality of the cattle prevented proper ploughing of the hard earth, the rainwater would partly cover the straw left from the previous harvest and remained clear. Hence breeding of anopheles culicifacies occurred among the tops of the straw at the surface of the water. This study clearly revealed how the shift to wet rice cultivation led to increased incidence of malaria. As a later report of a Rockefeller Foundation mission to India in 1957 showed, anopheles culicifacies was, in fact, one of the most important vectors in this region and responsible for the epidemic malaria in central India. The adults rested in cattle sheds and human dwellings and probably fed indiscriminately on man and cattle. The transmission season varied according to geographical distribution: in the Chotanagpur region it extended from August to December.[42]

Although R. Senior-White, the malariologist associated with the Bengal Nagpur Railway, recommended a thorough study of the rice-field problem in India, the shortage of funds prevented further research. Russell, therefore, recommended that both commercial organisations as well as governmental departments, particularly the Forest Department, should collaborate to devise a method primarily directed towards improving agriculture which would then indirectly control malaria by destroying the breeding grounds.[43]

Some of the post-Independence developmental schemes involving environmental management undertaken by the Government of India also had long-term implications for health and spread of disease. The Damodar Valley Corporation (DVC)'s river development scheme which began in 1948 included construction of dams and barrages across the

Damodar river system and focused on flood control, irrigation and power.[44] Although it coincided with the Government of India's malaria eradication programme, it appears that the aspect of malaria control had been given secondary importance. The valley had been frequently ravaged by floods, which necessitated some form of environmental management through the construction of dams and barrages. The original plan involved the construction of seven major dams, but in the end the DVC constructed only four dams (Tilaiya, Maithon, Konar and Panchet Hill) as well as a barrage and a network of canals (2494 km). This naturally brought the focus back to malaria control.

The surveys of malaria prevalence in the Damodar Valley showed that malaria tended to vary in different parts of the project area with varying topography and ecology of the vectors. There was a high level of prevalence among the people indigenous to the Konar Reservoir area, and a somewhat lower prevalence in the people of the Tilaiya Reservoir area in the upper valley.[45] The climate of the valley was such that development of the malaria parasites in mosquitoes was possible any time of the year. Following the inspection of the dam sites at Konar, Tilaiya and Maithon, and of the medical care and health services provided there and at Hazaribagh, R.B. Watson of the International Health Division of the Rockefeller Foundation concluded that the DVC had serious malaria problems associated with its operations which required several measures to prevent an increased incidence of malaria in the entire Damodar valley.[46] The impounding of the waters in reservoirs led to malaria among employees at the dam sites and other projects. At the same time, the indigenous Adivasi population increasingly succumbed to this form of malaria where breeding occurred in the fresh waters, rather than in jungles. The malaria control operations of the DVC, however, were confined to employees at various dam sites at that time.[47]

Transition to urban settlements

While malaria had been a recurrent problem with very differential impact upon different sections of the population, the transition to

urban settlements in Chotanagpur was also accompanied by the outbreak of 'new diseases' which were believed to be unknown in the region. One such incident occurred in the early 1950s in the town of Jamshedpur, the centre of the Tata Iron and Steel industry, and in the neighbouring regions, where around 893 people were afflicted by an unknown fever.[48] Although the 'mystery disease' – variously described as 'Jamshedpur fever' and 'Bihar fever' was never clearly identified, it was assumed to be viral encephalitis, and its spread was attributed to an arthropod vector. The epidemic extended over a period of four months from early May to the middle of June 1954, with a peak period of one month between June and July. About 20 deaths occurred during this time. The outbreak occurred at a time when rainfall was poor and humidity lower than in previous years, but contemporary investigations could not ascertain whether the climatic factors had any specific role in the outbreak of encephalitis. The disease at first appeared to be confined to children who were all healthy and well-nourished, but later spread to young adults as well. Fatality appeared to be higher among females than males. Investigations showed that overcrowding was marked in 25 per cent of the afflicted households, most of whom lived in slums, with poor cleanliness and ventilation.[49]

There was also some doubt as to whether the disease was entirely new to the region or not. Lt. Col. K. Najib Khan, the Chief Physician of Tata Main Hospital, asserted that it was a new entity which he had not previously encountered.[50] The investigation into the disease carried out by Dr J. Austin Kerr of the Virus Research Centre in Poona revealed the differential levels of immunity among the people exposed to it. For instance, in Bistupur and Sakchi, the two old and congested areas of Jamshedpur town, it was seen that in spite of high incidence of the disease, fatality was rare among people who had resided there for a long time.[51] This was explained in terms of the existence of low endemic foci in these two areas, causing some amount of immunity. Investigations further showed that the transmission occurred through house flies, mosquitoes and sand flies.

Concluding Remarks

Taking into consideration the changes in the landscape and the ecological balance since colonial times till the first decade after Independence we can reach certain conclusions. This article has demonstrated that starvation and the indigenous population became a recurrent norm following the shift to rice cultivation in course of the 19th century. Restricted access to forests together with limitations on hunting also had the result of changing the diet of the people. The increasing dependence on the consumption of grain lead to widespread hunger whenever the rice crop failed. Deprived of an essential part of their diets, formerly based on hunting and jungle products, Adivasis succumbed easily to disease, including diseases like malaria to which earlier they had developed some degree of resistance. The denudation of hills and forests and the new mining industries further destroyed the ecological balance and since the early years of the 20th century, environmental pollution, together with overcrowding and poor sanitation in the mining towns resulted the outbreak of in many previously unknown diseases. While the epidemics weakened both the Adivasi and the non-Adivasi population, the effect tended to be greater among the former who tended to avoid modern medical facilities, both because of the expense and also because of their deep-rooted cultural beliefs. In the post-Independence the expansion of mining, particularly uranium mining, came to profoundly affect the health of the local populace.

Notes

[1] P. J. Crutzen and E.F. Stoermer, 'The Anthropocene', *Global Change Newsletter*, 41 (17), 2000.

[2] See for instance, studies linking environment, health and medical knowledge carried out by Gregg Mitman, *The State of Nature: Ecology, Community, and American Social Thought, 1900-1950*, University of Chicago Press, 1992; Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge*, Oakland CA: University of California Press, 2006, in the context of North American environmental history; Warwick Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines*, Durham and London: Duke University Press, 2006, in the context of American colonization of the Philippines. Also see, Abdul Malik, Elisabeth Grohmann, Rais Akhtar eds. *Environmental Deterioration and Human Health: Natural and anthropogenic determinants*, Heidelberg, London and New York: Springer, 2014.

[3] Linda Nash, *op. cit*., 2006, 16.

[4] See for instance Michael B. A. Oldstone, *Viruses, Plagues, and History,* Oxford: Oxford University Press, 2000.

[5] Some of the exceptional research in this field includes that of David Hardiman, *Missionaries and their Medicine: A Christian Modernity for Tribal India*, Manchester: Manchester University Press, 2008; David Arnold, 'Disease, Resistance and India's Ecological Frontier', in Mahesh Rangarajan and K. Sivaramakrishnan eds., *India's Environmental History: Colonialism, Modernity and the Nation*, Vol. 2, Delhi: Permanent Black, 2012.

[6] By 'Chotanagpur', I include not only the districts in the contemporary Indian state of Jharkhand, but the geographical region comprising also the eastern vestiges of the Chotanapur plateau in the districts of Birbhum, Purulia and West Midnapur in the state of West Bengal.

[7] For details, see Sanjukta Das Gupta, 'Colonial Rule versus Indigenous Knowledge in Bengal's Western Frontier', in *RCC Perspectives*, Rachel Carson Center, Special Issue on 'Asian Environments: Connections across Borders, Landscapes and Times', vol. 3, 2014, 45-52.

[8] For details see Romila Thapar and Majid Siddiqi, 'Chotanagpur: the pre-colonial and colonial situation', in R.D. Munda and S. Bosu Mullick eds., *The Jharkhand Movement: Indigenous People's Struggle for Autonomy in India*, Copenhagen: IWGIA & BIRSA, 2003, 32-43; Sanjukta Das Gupta, *Adivasis and the Raj: Socio-economic transition of the Hos, 1820-1932*, Delhi: Orient Blackswan, 2011, 62-75; Paul Streumer, *A Land of their own: Samuel Richard Tickell and the Formation of the Autonomous Ho Country in Jharkhand*, 1818-1842, Houten: Wakkaman, 2016, pp. 10-20.

[9] Thapar and Siddiqui, op. cit., p. 42.

[10] Walter Hamilton, *A Geographical, Statistical and Historical Description of Hindustan and the Adjacent Countries*, vol. 1, London: John Murray, 1820.

[11] For details, see for instance, P.P. Mohapatra, 'Some Aspects of Arable Expansion in Chotanagpur: 1880-1950', *Economic and Political Weekly*, April 20, 1991, 1043-1054.

[12] G.C. Depree, *Report, Geographical and Statistical on That Part of Chotanagpore Division Which has Come Under the Topographical Survey*, Calcutta, 1868.

[13] Valentine Ball, *Jungle Life in India or the Journeys and Journals of an Indian Geologist,* London: Thomas De La Rue & Co, 1880, 90.

[14] Vinita Damodaran, *'Famine in a forest tract: ecological change and the causes of the 1897 famine in Chotanagpur, Northern India', Environment and History*, vol. 1 (2), 1995, 129-158.

[15] P. P. Mohapatra, *op. cit*. April 20, 1991.

[16] L.S.S. O'Malley, *Bengal District Gazetteers: SantalParganas*, Calcutta: The Bengal Secretariat Book Depot, 1910, 179-180.

[17] Valentine Ball, 'On the Jungle Products Used as Articles of Food by the Inhabitants of Manbhum and Hazaribagh', *Journal of the Asiatic Society,* vol. 36, no. 2, 1867, 47.

[18] For details on famines in Chotanagpur, see Vinita Damodaran, *'Famine in Bengal: A Comparison of the 1770 Famine in Bengal and the 1897 Famine in Chotanagpur', Medieval History Journal,* vol. 10 (1-2), 2007, 143-181; Nirmal Kumar Mahato, 'Environmental Change and Chronic Famine in Manbhum, Bengal District, 1860-1910', *Global Environment, vol.* 6, 2011, 68–94; Sanjukta Das Gupta, 'Colonial Rule and Tribal Agriculture: the Kolhan Government Estate in Chotanagpur', in Shireen Moosvi ed. *Capitalism, Colonialism and Globalisation: Studies in Economic Change*, Delhi: Tulika Books, 2011, 56-71.

[19] Commissioner of Chotanagpur Division to Secretary, Govt. of Bihar & Orissa, Rev. Dept., 21-23 September 1915, Rev (Agri.) *Proceedings,* No 15, April 1916, Bihar State Archives.

[20] P. C. Roy Chaudhury, *Bihar District Gazetteers: Singhbhum*, Patna: Secretariat Press, 1958, 153.

[21] Ibid.

[22] Ibid.

[23] L.S.S. O'Malley, *Bengal District Gazetteers: Singhbhum, Seraikela and Kharsawan*, Calcutta, The Bengal Secretariat Book Depot, 1910, 97.

[24] O'Malley, *op. cit*., 1910, 152.

[25] Ball, *op. cit*., 1880, x.

[26] Paul Streumer, Tickell, *op.cit*., 706.

[27] Walter S. Sherwill, 'Notes Upon a Tour through the Rajmahal Hills', *Journal of the Asiatic Society of Bengal*, Vol 20, 1851, 549.

[28] For a discussion on habitation and health in colonial India, see Nandini Bhattacharya, *Contagion and the Enclaves: Tropical Medicine in Colonial India*, Liverpool: Liverpool University Press, 2012.

[29] 'Enteric Fever in Hazareebagh', *Indian Medical Gazette*, 1 September 1874, 244.

[30] Assistant Surgeon, Bengal Army, and Professor of Materia Medica and Medical Jurisprudence in the Bengal Medical College.

[31] 'Enteric Fever in Hazareebagh', p. 245.

[32] L.S.S. O'Malley, *Bengal District Gazetteers: Palamau*, Calcutta, The Bengal Secretariat Book Depot, 1907, 62.

[33] Ibid.

[34] Ibid, 63

[35] Tickell, *op. cit*., 783-784.

[36] Nandini Bhattacharya, 'The Logic of Location: Malaria Research in Colonial India, Darjeeling and Duars, 1900–30', *Medical History*, April 2011; 55(2): 183–202.

[37] S.R. Christophers, *Enquiry on Malaria, Blackwater Fever and Anchylostomiasis in Singhbhum: Preliminary Investigation into the Conditions on the Bengal Iron Company's Mines at Manoharpur*, Patna: Superintendent, Government Printing, Bihar and Orissa, 1923, 30.

[38] Bhattacharya, *op.cit*., April 2011.

[39] Sheldon Watts, 'British Development Policies and Malaria in India 1897–*c*.1929', *Past and Present,* Vol. 165, 1999, 141–81; Ira Klein, 'Death in India: 1871–1921', *Journal of Asian Studies*, Vol. 32, 1973, 639–59. Also see Arabinda Samanta, *Malarial Fever in Colonial Bengal: Social History of an Epidemic, 1820–1939*, Kolkata: Firma KLM, 2002, for a discussion of British development policies in causing malaria.

[40] Since 1915, the International Health Division (IHD) of the Rockefeller Foundation focused on a programme to eradicate malaria. Rockefeller Foundation's involvement included the contribution of funds and personnel, anti-malaria demonstrations, surveys to map the disease, personnel training, field studies and research.

[41] 'Reports of Malaria Tours in India, 1934-35', Rockefeller Foundation (henceforth RF), RG 1.1, Series 464, FA 386, Box 11, Folder RUS 7, Rockefeller Archives Center.

[42] 'Report on Mission to India', RF, RG 1.2, Series 464, FA 387, Box 72, Rockefeller Archives Center.

[43] Russell's Confidential Report, RF, RG 1.1, Series 464, FA 386, Box 11, Folder RUS 7, Rockefeller Archives Center..

[44] For a study on the political imagination and debates that informed the Damodar Valley project, see Daniel Klingensmith, *One Valley and a Thousand: Dams, Nationalism, and Development,* New Delhi, Oxford University Press, 2007.

[45] 'Notes on the Development of Malaria Studies and Control Programme, DVC', RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, Rockefeller Archives Center.

[46] R.B. Watson to George K. Strode, 7 October 1950, 27 March 1950, RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, Rockefeller Archives Center.

[47] 'Notes on the Development of Malaria Studies and Control Programme, DVC', RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, Rockefeller Archives Center. Watson's report, in fact, was highly critical of the DVC's responsibility in the spread of malaria among the indigenous population and it outlined the necessity of organizing a detailed Malaria Control Programme for the Damodar Valley and suggested enabling of legislations which obliged the DVC to perform such activities

[48] 'Note on the Epidemiological Aspect of the 1954 Outbreak of Encephalitis in Jamshedpur', RF, RG 6, SG 7, Series 113, FA 396, Box 146, Folder 1065, Rockefeller Archives Center.

[49] Report of Lt. Col. Najib Khan, Physician-in-Charge, Tata Main Hospital, 18 July 1954, RF, RG 6, SG 7,Series 113, FA 396, Box 146, Folder 1063, Rockefeller Archives Center.

[50] Ibid.

[51] J. Austin Kerr to K.S. Master, 20 September 1954, RF, RG 6, SG 7, Series 113, FA 396, Box 146, Folder 1065, Rockefeller Archives Center.

Pollution, Public Health and the People of Calcutta: The Nineteenth Century

Mahua Sarkar

The social history of medicine covers a wide range of themes like attitudes to diseases, medical treatment and systems of medical care, public health policy and the nature of its implementation and so on. The present paper relates social history of public health with the history of social ecology to show how early Calcutta became a city-scape for the growth of new notions of public health as well as for becoming the hot bed of diseases. Probing through the journey of Calcutta as a growing city in the nineteenth century, one can realize that the city embodies the best and worst aspects of civilization. On the one hand, a city diversifies peoples and their activities, encourages innovations and creates new opportunities; on the other, problems of overcrowding, crime, poverty, health and pollution may severely undermine the ambience of a city. Since the days of the Industrial Revolution in Europe and the United States of America, the technological application of the reductionist science of Bacon and Newton had led to a general prosperity and improvement of the material culture, while at the same time, the question of environmental pollution and public health had become a serious concern for the idealists and environmentalists. Many serious movements were organized in protest of industrialization and technological growth. Serious queries were raised about human rights for all human beings.[1] Writers like Shelley, Keats, Wordsworth and Dickens had written about the miserable conditions of the workers and the pollution which darkened the skies of Europe. Eco-theologists of U.S.A. like Emerson, Thoreau, Muir and Leopold were critical of this technological growth.

Serious queries were raised about the link between industrial pollution and health of the common people.[2]

It is generally believed by all that the question of urban development can never be addressed without reference to the notions of decay, degradation and pollution. Ecological disasters are bound to be essential components of development, unless that development is sustainable. Sustainable urban development specifically means achieving a balance between the development of the urban areas and protection of the environment, with a special attention for equity in employment, shelter, basic services, social infrastructure, public health, and transportation in the urban areas. These issues varied in paradigm, in time and space and the theory is evident from the analysis of the decline of civilizations. This is particularly true of colonial Calcutta. It became a primate city in the nineteenth century, being the administrative, economic and socio-cultural hub of the colony. It created new opportunities, and experienced the arrival of a series of migrants. The 'modern' concept of 'public health' emerged in the arena of this city while at the same time ecological degradation and decline of public health started undermining the quality of life there since the early decades.

To begin with, the word 'pollution' is spatial, individual, public as well as socially constructed. The word has thus manifold implications. According to Webster's Dictionary, to 'pollute' means 'to make physically impure' or 'unclean' or 'to contaminate the environment especially with man-made waste.'[3] The term is not related only with the modern urban scenario and the connotation was prevalent since the pre-modern times. In India, the word was used in wider social and cultural contexts. Suvira Jaiswal argues that the theory of purity or pollution arising from birth was inherent in the'*varna'* system which denied access to social prestige and power to so-called impure castes through non-polluting occupations.[4] The principle emerged mainly due to the widening of social distance between the dominant and subservient communities.[5] This notion of pollution had also influenced the Islamic society of Bengal from the thirteenth to sixteenth centuries. Kabikankan Mukundaram Chakrabarti, in his *Chandimangal,* mentions

fifteen Muslim *'jatis'* in a list of communities living in a typical Bengali city of his day.[6] Of these people, the so-called polluted groups like the scavengers, the gravediggers, and the sweepers were almost living in a status of untouchables.[7] Naturally, these notions of ritual purity create artificial divisions on the basis of power and thereby make the society hierarchical, differentiated and polluted in itself. Apart from this unscientific idea of physical pollution for birth or occupation, the scientific or eco-friendly attitude towards pollution was also found in the ancient texts like the *'Charakasamhita'*.[8] There, all forms of environmental pollution were termed as *'bikriti'*, and pollutions due to sound and odour etc. were rigorously mentioned. The people were requested to maintain cleanliness in all kinds of open mass like land and water, and if not, then serious punishments were to be inflicted.[9]

The ideas of pollution however did not have a drastic change in the medieval times while it received a new dimension with the advent of western conception of public health with new ideas of disease, cleanliness and sanitation. Throughout the late nineteenth and early twentieth centuries, the British made concrete efforts towards dispensing western medicine and sense of cleanliness through hospitals and dispensaries, promoting vaccination for smallpox, controlling cholera and the implementation of sanitary schemes including water supply, drainage, and conservancy. The present article investigates the extent of success of that effort.

Medical history is not a new trend in the field of history writing in India. The imperialist schools of historians think that the core, i.e., western science and medicine of the colonizing country had completely regulated the impact in the peripheries or the colonies. Deepak Kumar, on the other hand, has critically reviewed the relationship between science and imperialism from various aspects, in his pioneering work on 'Science and the Raj'[10] and in later publications. Scholars like Mark Harrison also argue that western medicine in India had its own typical uniqueness and many other scholars are now highlighting the importance of the peripheries or the micro-local in the history of medicine.[11] Many historians have written on the history of public health in India. The works of Mark Harrison, Roger Jeffrey, Deepak Kumar,

Biswamoy Pati, Radhika Ramasubban, Poonam Bala etc.,[12] for example, are worth mentioning. Kabita Ray, in her *History of Public Health: Colonial Bengal* (1998), has studied the colonial health policies and the Indian reactions from 1921 to 1947[13] and has collected a significant descriptive narrative. So far as the history of Calcutta is concerned, scholars have rarely addressed the issues of pollution or environmental sanitation from the perspective of the geographical evolution of this particular city. Scholars who have written on the history of Calcutta in the nineteenth century, like P.T. Nair, A.K Roy, Pradip Sinha or Sumanta Banerjee, but have not addressed the issues of pollution and public health together with the history of the city.[14] M. R. Anderson has written on the smoke pollution of early Calcutta and colonial hegemony or politics regarding it but had not touched upon social issues.[15] Sumit Guha's work on *Health and Population in South Asia* is a macro-study covering the theme of environmental sanitation in eastern India.[16] He suggests that public health measures of environmental sanitation created 'little islands of purity' in the miasmatic landscape of India to protect the health of the army and the administration. It was further mentioned that as there was complete ignorance of the exact aetiology of the diseases, the medical authorities launched a campaign of environmental sanitation.[17] The issue of public health is thus linked with the history of medicine and the politics of colonial finance.

The concept of public health evolved in England in the eighteenth century as a consequence of the impact of the industrial revolution and its consequential problems like slums, accumulation of refuse and excreta, overcrowding and other environmental problems. In the nineteenth century, i.e. in 1832, James Kay Shuttleworth, in his *The Moral and Physical Conditions of the Working Classes Employed in the Cotton Manufacture in Manchester* (1832) described Manchester thus: "The state of the streets powerfully affects the health of their inhabitants. Sporadic cases of typhus chiefly appear in those which are narrow, ill ventilated, unpaved, or which contain heaps of refuse, or stagnant pools. The confined air and noxious exhalations, which abound in such places, depress the health of the people, and on this

account contagious diseases are also most rapidly propagated there."[18] It was also mentioned that "the houses are often ill-ventilated, unprovided with privies, and as a result, the streets, which are narrow, unpaved and worn into deep ruts, became common receptacles of mud, refuse and disgusting ordure."[18A] In 1866, the British Parliament passed the Sanitary Act making local authorities responsible for the removal of 'nuisances' to public health and for the improvement of slum dwellings. Roy Porter writes in this context that the medical colleges never gave a boost to the public health movement and that prevention could not be achieved so long as the people were living in a lethal environment.[19] Porter also comments that none of the early sanitarians in England were doctors.[20] The famous sanitarian and lawyer Edwin Chadwick's 1842 Report informed about the frequent outbreaks of dysentery, and the pitiable sanitary conditions of the labouring population in England.[21]

There is however a striking similarity between the above statements and J. R. Martin's *Medical Topography of Calcutta* of 1837, where he writes about Calcutta roads as 'dirty, narrow and unpaved.' He expressed a total lack of confidence in the sanitary habits of the 'natives.' He stated, "It must be confessed, the natives have yet to learn in a public and private sense, that the sweet sensations connected with cleanly habits and pure air, are some of the most precious gifts of civilization."[22] Colonial considerations of public space began in Calcutta from the question of the army. The 1864 law regarding communicable diseases was made in keeping with the health needs of the army. There was a large army cantonment in Calcutta and the soldiers were allowed to visit only registered sex workers. It was thought that this law would prevent the soldiers from venereal diseases. In practice, it did not happen accordingly. Between 1817-1857, only 6% of the Company's soldiers were killed in battles, others died of diseases. Initially, the British officers nurtured the theory of 'bad environment' or a climatic miasma behind the prevalence of diseases in Calcutta.[23] The question of public health was thus becoming politically and economically important and there was the gradual emergence of a 'public health' policy. Public health required the entry of different

kinds of professions: medical men treating diseases, epidemiologists and bacteriologists investigating the sources of the disease and modes of transmission, statisticians calculating quantitative measures of births and deaths, sanitary engineers constructing roads, water and sewerage systems, sanitary inspectors enforcing compliance with public health ordinances; and administrators having the responsibility to organise everyone, debating budgetary allocations and getting sanitary regulations codified. Throughout the nineteenth century, the initiatives for a proper environmental sanitation were undertaken, while the entire scheme remained largely superficial as there was a greater concern for finance and the government avoided such measures which would provoke acute hostility among the natives.

Meanwhile, the process of urbanization was also initiated by the administration. The map and geographical space of Calcutta was constantly changing. Gradual clearance of forests, increasing habitation, and brick-built constructions caused rapid urbanization and a general degradation of the natural environment. Calcutta was originally a port of the once extended Sundarbans. The city, situated on the east bank of the river Hooghly in latitude 22′ 23′ 47′ and longitude 88′ 23′ 34′E was exactly 8,6213 miles away from the sea or the Bay of Bengal in the 18th century.[24] Geologically speaking, Calcutta is situated in the lower Gangetic delta. It forms part of the Bengal basin, and is standing on a thick alluvial deposit of quaternary age, overlying a vast thickness of tertiary and Mesozoic sediments in a subsiding trough, whose sedimentation is in a very fast swing. It is part of the riverine delta, constantly changing its shape due to changes in the watercourses.[25] Undoubtedly, with an assemblage of fossil pollen grains and spores of a late quaternary vegetational history, the flora and fauna of Calcutta were changing rapidly with urbanization. Wild buffaloes that charged Clive's sepoys at Baghbazar and the giant adjutant birds who were the unpaid scavengers of Calcutta during the pre-municipal days were no longer found in the late 18th century.[26] Warren Hastings, the first Governor-General of Bengal, was supposed to have hunted tigers and elephants in the Maidan near present St. Paul's Cathedral.[27] Also, although favourable for trade, the low, swampy, hot and humid

riverbank location of Calcutta was not very ideal for human habitation. While initial topography had confined the metropolitan area to a strip of 3 to 5 miles wide reclamation projects were expanding the limits of usable land to the east, south and west of the central city throughout the nineteenth century.[28]

The flora and fauna of Calcutta had changed completely with growing urbanization. Large scale deforestation and growing interference of human beings have made Calcutta what it is today. But it did not happen in a day. It is a journey from the 18th century and is obviously a long durèe, as we all know that environmental changes occur very slowly or almost silently, till the threat to survival becomes imminent. It should be mentioned here that although Calcutta was favourably located for trade, its climate did not suit humans and this environmental imbalance was reflected in the scenario of public health.

The Questions Raised

Through this research I am questioning the proper implication of the notions and terminologies like 'health and hygiene', 'clean landscape', 'wiped floors', 'sanitized toilets', etc., in a city, initially unplanned under a colonial set-up, and later monitored according to the language and needs of colonial imperialism. The present paper is a discussion on the streets, houses, toilets, markets and the general environment, and I have addressed the questions of public health or individual hygiene in terms of environmental pollution. The analysis exposes the contradictions of a colonial government between its inbuilt demand to fulfill its own financial or martial imperatives and the requirement for hygiene and sanitation in a growing city. It also enquires whether there was a paradigm shift in the notion of pollution itself, with the advent of colonial modernity.

The very idea of environmental development stands under scrutiny in a 'city of differences' like Calcutta. The comment is particularly true about early colonial Calcutta in the nineteenth century. With western modernity, concepts of pollution, sanitation and public health, prominent in post-industrial revolution Europe, came to Calcutta along with the merchants of the East India Company and British

administrative officers. To the colonizers who introduced these concepts for the necessity of the army and their own people, the 'pagan natives' were always secondary to their own consideration. Moreover, there was a difference in the very idea of pollution of the oriental and occidental worlds, which occurred in two completely different ecological existences. Dipesh Chakrabarty argues in this context that in the language of modernity and civic consciousness, the Indian indifference to the notions of 'private' and 'public' in their use of open space, had a contrast with the immaculate 'order' of the European quarters.[29] In the dominant ideas of western perception, India was a place of heat and dust, crowd, dirt and diseases and the idea had never undergone a change.

The Early narratives

The orientalist scholars and contemporary visitors often imagined the Orient from the perspective of an imagined otherised non-modern, non-scientific exotic world. Their descriptions are interesting and it is also true from their gazes that, Calcutta offered a different scenario altogether. The idea of an open space and its utilization, the social and religious rituals related to birth, marriage, death and disease; the general perceptions of cleanliness, hygiene, and pollution differed in the East and the West; the two cultures were different. In most of the writings on British India, the ideas of climatic miasma, or pestilential air, the 'dreaded 'picture of the dead bodies ('cremated' and not buried), floating dead bodies, flowing ashes, 'frightening unknown animals', and 'fearful scavenger birds', were commonly found. The revival of environmentalist ideas in eighteenth century Europe, as evident from the publication of Montesquieu's De l'esprit des Lois in 1748, popularized the ideas of an exotic orient in a different landscape. This was prominent in the manifold descriptions of contemporary Calcutta. James Mitchell, a clerk of Captain Philip Carteret of the East India Company visited Calcutta in 1747 and 1748 and he writes about the young city thus: "Cold raw Fogs, mostly prevailed during the night while I remained in Calcutta, which dispersing at Sunrise, as the day advances the heat becomes intolerable. During the night…Jackals,

with which the Country abounds, and sometimes Tigers, come into and clear the streets of every impurity, …As the Gentoo's carry their dying and dead within high water mark of the sacred River, numbers of their Bodies floated past every day with Crows upon and picking them; or if thrown ashore, where they emit a most insufferable stench, the Jackals and paria Dogs in the night clear them to the Bone".[30] While this scenario was common in rural-urban Calcutta, the area seemed to be 'polluted' in the British documents. Naval medical officers like Charles Curtis, John Clark and others found the topography of Bengal far different from that of Europe. According to John Clark, (1744-1805),who was a surgeon on the Indiaman *Talbot*, and who resided in Calcutta from 1768 to 1771, much of the fever among residents of Calcutta was due to an air vitiated by vapours from the nearby salt lake.[31] He wrote, "As soon as the rains are over, the lake subsides, and leaves on the ground abundance of mud, slime, prawns, and other fish, which soon putrify with the heat of the season, and occasion very noxious exhalations. The land to the northwest does not afford a more favourable prospect, being low, swampy, and fit only for the cultivation of rice."[32] The pace of the improvement of this situation appeared to be very slow in a colonized territory, or was conditioned by choices of the civilizing mission of the West. Scholars like Mark Harrison, argues in this context that prior to 1800, European medical practitioners in India had regarded disease to be intimately bound with the peculiar climate of India, but this attitude was gradually transformed in the nineteenth century.[33] Since then, attention was diverted to the sanitary problems caused by the rapid expansion of towns such as Calcutta, ravaged by severe epidemics. Earlier, they had avoided unfavourable environments, they now tried to transform them; earlier, they had praised indigenous hygienic practices, they now despised them. Harrison points out that all the Europeans had not regarded India as the 'irredeemably other', they took India, with a difference which was one of degree and not of kind.[34] He has rightly stated that many of the earlier 'Platonic essences were tempered by a world of pragmatism and interventionism in the nineteenth century.' He refers to the writing of the sanitary reformer, J. R. Martin, entitled

Medical Topography of Calcutta (1837), where the author wrote both on the essential idleness of the Bengalis as well as on the universal need for an education in hygiene.[35] Thus there were anxieties, insecurities and there was no binary polarity between a bad European and a good Indian. At the same time, the situation was more complex than this simple equation. Other considerations, mainly of investment and expenditure and lack of indigenous knowledge, often guided the policy-making and its implementation for a cleaner Calcutta. As a consequence, we do not see the emergence of a homogenous developmental perception of pollution in the city.

Order of Aesthetics and Civic Consciousness

The link between coercive institutions like the court and the police and promotion of Calcutta as a cityscape explains the complications of colonial hegemony. Dipesh Chakrabarty speaks of certain ideas of beauty related to the management of public space and interests.[36] The order of aesthetics could not be separated from the ideals of public health and hygiene. He refers to Wellesley's Minute of 1803 in support of his argument; "In those quarters of the town occupied principally by the native inhabitants, the houses have been built without order or regularity, and the streets and lanes have been formed without attention to the health, convenience or safety of the inhabitants……. The appearance and beauty of the town are inseparably connected with the health, safety and convenience of the inhabitants, and every improvement…. will tend to ameliorate the climate and to promote and secure… a just and salutary system of police."[37] Similar expressions are found in European writings throughout the nineteenth century. So far as the Indian situation was concerned, urbanization and pollution went hand in hand from the beginning of colonization by the British. In particular, colonial Calcutta in the 18th and 19th centuries provided a peculiar site of contrast between urbanization and pollution. Out of an apparently obscure place of hutments and conglomeration of small hamlets, where people used to participate in small trading activities, Calcutta grew out into a populous city, with an ever-expanding frontier. The urban growth coincided with the

coming of the British as commercial and political masters. Right from the beginning, it was an unplanned city, fashioned by the colonial British to suit their own purposes. The city was an economic construct and a social product, emerging out of external forces. The location of the city was selected due to its suitable physical geography. Calcutta was a port city with an easily defensible position, convenient for trade and administration. Its development as a city should be understood from the context of the dominance-dependence relationship that existed between the imperial ports and the colony. The city was hardly allowed to develop along indigenous lines. In the colonial society, the urbanization which took place was dependent on the needs of the metropolitan economy. Calcutta, which was one of the earliest colonial settlements of the British, was used by them mainly as a centre for organizing the linkages necessary for extracting from the vast hinterland of the country, the resources required for developing the economy of England. The nature of these linkages influenced the city's pattern of growth.[38]

Calcutta in the pre-colonial days: the Environ

Modern researches show that Calcutta was not entirely born out of any midday halt of Job Charnock (1630-1692), one of the early administrators of the English East India Company[39]; it had its existence in the Mughal revenue documents, particularly in the rent-rolls of 1596, furnished by Todarmal, the finance minister of the Mughal emperor Akbar.[40] The name "Calcutta" was also found in the Bengali *mangalkavyas* of the sixteenth century, composed by Bipradas, Mukundaram, Kshemanand and Krishnaram Das.[41] This part of south western Bengal was known for its trade in salt, cotton, jute, indigo and opium. Calcutta was inhabited by weavers, small traders and fishermen before the coming of the British. It was a natural port with a riverine connection with the hinterland. The British East India Company had selected this area due to commercial, political and geographical reasons. Gradually Calcutta was linked with the international Canton trade system; it became a heterogenetic centre of trade and commerce. It became the commercial, administrative and

cultural capital of the British in India. Thus the jingle of Rudyard Kipling (From the noonday halt of Charnock/ Grew a city / More's the pity) is not true, while Desmond Doig's fanciful description of the visit seemed to depict a correct ecological framework: "I fancy tigers watching from the dark jungle on the river banks, crocodiles fatly swerving as the ships' boats pulled for shore lumbering tab of adjutant cranes and a man of destiny mindful only of the rain and river mud as he scrambled ashore".[42]

The White town and the Black town

What is now considered as Calcutta proper originally comprised of three villages; Sutanuti, Dihi Kolikata and Gobindapur. The entire area was often infested by dacoits who attacked the waylaid pilgrims from the jungles and waterways, while the villages were well known for trading. The city began to take shape from 1698 when the East India Company managed to purchase from the Majumdars (the original zamindars), at a cost of Rs.1300, the right to be zamindars or revenue collectors of three villages, Sutanuti, Dihi Kolkata and Gobindapur. The area from Baghbazar canal up to Nimtala was known as Sutanuti. South of Nimtala to Chandpal Ghat was known as Kalikata and the area from Chandpal Ghat to the Adiganga was known as Gobindapur. "Little better than a hamlet that was hardly inhabited by any of the higher castes", Sutanuti was a major centre of handloom weavers who produced exquisite chintz.[43] It was here that Job Charnock, the Company's chief in Bengal, first established his settlement in 1690. Rich Bengali merchant families, the Seths and the Basaks, trading in cloth long before the advent of the British, operated from Gobindapur, south of Sutanuti.[44] The majority of the inhabitants of the three villages were agriculturists or fishermen, while the weavers and traders were the first trading communities, whose collaboration led to the emergence of the 'bazaar' or market settlement that remained as the basic model of the indigenous part of Calcutta. That part was known as the black town, as distinct from the white one, or the European part of the town. After gaining possession of the three villages the Company began to build warehouses, improve the port facilities and construct the Fort William to protect its own interests.

It had to pay the Government of Bengal an annual rent and was allowed to collect a certain amount from inhabitants of the black town, according to the size of their lands, as also by way of taxes and duties. The three villages were merged and commonly called 'Calcutta'. The settlement hardly bore the features of a town. But the prospects of economic security and fortune making began to draw a heterogeneous crowd, rich and poor, in the new city. The victory of the Company in the battle of Plassey in 1757 and the acquisition of the Dewani rights in 1765 enhanced the British commercial interests and prospects of urbanization. But from the beginning, the physical-spatial structure of the growing city was split into two, on the basis of man-made differences. The white town was in the south-central part of Calcutta around Fort William, where English settlers by degrees built themselves very neat, useful, if not elegant houses, laid out walls, planted trees, and made their own little district neat, clean and convenient.[45] The English settlers jealously guarded themselves from any possible contamination by the black inhabitants of the area. This is evident from the frequency of orders issued from Fort William banning the entry of the 'natives' into the white town, except at certain hours.[46] Initially, this physical self-segregation was not so rigidly followed in the 18th century, when the British were learning local customs for the purpose of ruling, but the principle was becoming very important from the early part of the 19th century, when the image of exclusiveness of the ruling class was more firmly established.

Thus, from the very beginning, the primate city, as it was called, developed with a hierarchy of differences and the level of civic amenities differed widely in the white and black towns. The black town developed in the north, around the original settlement at Sutanuti. J. R. Martin, described its growth in the following manner: "The north division between Bow Bazar and Muchua Bazar comprises perhaps the most dense part of the native population of Calcutta…the houses of the wealthier classes are brick-built, from two to three stories high, closely constructed and divided only by dirty, narrow, and unpaved streets; the roofs are flat and terraced…"[47] Apart from these

broad divisions, there were the intermediate zones and the suburbs which were constantly appropriated within the map of Calcutta. The eastern suburbs harboured the system of dumping the city garbage in any of the numerous dihis in the wetlands throughout the nineteenth century and the entire area remained underdeveloped.

City of Palaces and City of Slums

In spite of a considerable increase in the number of the masonry buildings in the early nineteenth century, Calcutta remained a city of hutments throughout the period. Many of the thatched huts were tiled in 1837.[48] But that was hardly anything. The city was a peculiar combination of paddy fields, canals, creeks, streets, marbles and palaces. The fringes of the white town were developed into a heterogeneous intermediate zone, inhabited by poor whites, Eurasians, large number of Muslim service groups, and small communities of Jews, Armenians and Chinese. Few other propertied Muslims lived in Cossipore in the north, Tollygunj in the south, Garden Reach in the south-west, and in the scattered outskirts.[49] At the north-western edge of the intermediate zone but close to the European business hub lay Burrabazar, the lynchpin of Calcutta's commerce, with other parts of the subcontinent and, even beyond, connected by river, land and then railways.[50] In 1850, Colesworthy Grant found Persians, Arabs, Jews, Marwaris, Armenians, Madrasees, Sikhs, Turks, Parsees, Chinese, Burmese and Bengalis in Calcutta.[51] It was thus city with a multiple, multicultural, layered, society of inhabitants, with different tastes and attitudes towards purity and pollution. The East India Company had no obligations to render civic services to the black town. The menials of the black town were left at the mercy of the local bania-turned-into-zamindars. Calcutta thus grew up as a city of palaces and city of slums from its very early days. The palaces had a uniform structure, with gardens, courtyards, temples, servants quarters and the interior or ladies quarters or '*andarmahals*'.[52] Information on toilet habits are very scanty, while we get some idea about the dark, gloomy pictures of the 'sutikagriha' or birthplaces of children. Surrounding the palatial buildings of the black town, there were the bazaars and clusters of

hutments where the unorganized working class lived. The rich households drew these poor people who were needed for service. Modelled on small villages, these localities became replicas of feudal estates; slowly and unhealthily changing in response to urban needs. Building toilets and getting people to use them was critical for public health. The elements of successful sanitation adoption depended on three factors (1) political will on the part of both government and the people (2) social pressure, or cultural contact between inhabitants and toilets (3) political ecology, i.e., assured access to water, compatible soil type, and changing land use. These three factors were absent in the hutments which formed the great slums of Calcutta where the majority of the people lived. The urban landlords, acting with a frame of mind influenced by both traditional and new notions of urbanity, often maintained the slums of Calcutta, retaining a powerful trend towards urban heterogeneity as well as an indigenous character of an earlier traditional type.[53] The slum-dwellers therefore did not accept the western notions of public health so easily.

The trend did not bring forth an overall urban development. Describing the living conditions of the slum dwellers, J. R. Martin, remarked; "The mass of laboring classes live in huts, the walls of which are of mud, or of matted reed or bamboo, roofed with straw or tiles, according to the means of the occupant; these would be not so bad, but that they are uniformly placed on the bare ground, or on damp mud, but little raised, which continually emits injurious exhalations."[54] The following poem by Atkinson published in the Calcutta Review had a description of the extremely insanitary and unhygienic conditions of Calcutta in the 18th century:

> Calcutta what was thy condition then?
> An anxious, forced existence, and thy site
> Embowering jungle and noxious fen
> Fatal to many a bold aspiring might
> On every side tall trees shut out the sight
> And like the Upas, noisome vapours shed;
> Way blazed with heat intense and murky night
> Brought damp excessive and a feverish bed.[55]

Markets/Bazars /Ganj/Qasba/Hat

The city of Calcutta saw a flurry of bazar-founding activity throughout the late 18th century. Officials often lodged complaints about this encroaching on the public roads.[56] Yet, a contemporary observed, "(the) more bazaars there are in Calcutta, the more beneficial it must be, to the government and to the public."[57] "The former would have received more revenue, moreover, it is an object of real consequence to the poor of Calcutta, will be supplied with the necessaries of life in greater abundance and at the cheaper rate".[58] Methods of retailers assembling in the city were in disorder, in that they did not proceed from a central and successively implemented state plan. They seemed to have been scattered throughout the town of Calcutta, even vending by the roadside due to 'the want of proper spots for markets.'[59] Traders evicted from there continued to assemble in bye-lanes and corners where the Company imagined they at once resumed trade: 'no sooner (were they) removed from one place that they assembled in another.'[60] Thus markets in a big city like Calcutta were dispersed in different localities with no idea of modern planning or cleansing. Repairs to markets also occasioned upheavals. Driven underground, markets became informal and mobile; developing in another location after the officials drove them away. The trail of dirt that markets were said to bring from swampy places was a further nuisance. The unregulated and chaotic situation of city markets encouraged private traders to petition for the rights to appropriate space for the sellers of different commodities; site owners assumed the responsibility for cleansing marketplace of dirt.[61] Petitions were made to raise the level of the earth and to set up a terraced, supported covering, with brick drainage for rainwater. Other proposals also demanded an area for the sale of cattle, and a slaughter house with its own cleaners.[62] Permanent buildings for markets of this sort were exceptions in Calcutta, though the late 18th century was a time of extremely rapid growth for Calcutta, in terms of building, trade and shipping.[63] The different connotations show that the local perception of a market was plural. Markets varied in sizes, shapes, nature and culture. Dipesh Chakrabarty interprets the marketplace as the meeting

place of various communities, as a different paradigm, as an ambiguous outside.[64] He argues that the bazar is exposed and therefore malevolent. It is not subject to a single set of (enclosing) rules and rituals defining a community. It is where miscegenation occurs. All that do not belong to the 'inside' (family/kinship/community) lie there, cheek by jowl, in unassorted collection, violating rules of mixing, from feces to prostitutes. There was not a single idea of purity or pollution in a bazaar. He quotes from a nineteenth century traveller to show the European gaze in a particular bazaar scene and comments that the description of the bazaar reveals the western perception of the Indian character, 'ever present dirt and disorder'. 'Filthy drains, disgusting settlers, crowded and noisy lanes, people, birds, goats, dogs, and fowls,' all worked together to produce the effect of a nightmare.[64A] To this Indian 'chaos' was opposed to immaculate 'order' of the European quarters where 'pleasant squares,' 'white buildings, with their pillared verandas' and 'graceful foliage' lent, to European eyes, a 'fairy-like loveliness' to 'the whole scene.'[65] Martin Beattle, in this context, writes about the hybrid bazaar space, using Mikhail Bakhtin and Homi k. Bhaba's notions of hybridity, as an interpretive tool. He makes a micro-study on the Marwaris of Burrabazar to show the changing effects of colonization and globalization on them.[66] He vividly describes the gaddi or shop units of the Marwaris who came in larger numbers after the construction of the Delhi-Calcutta railways in 1858-60: 'The floor of the gaddi was raised, keeping it clear of dirt from the street and monsoon rain, and covered with a mattress and white cotton sheet. As well as providing business accommodation during the day, the gaddi was often used as accommodation for an extended family at night."[67] Martin argues that this hybrid space possessed a partial culture and contained elements of politics, oppression and cultural corruption and also xenophobia of its own kind.[68] He, however, gives an interesting picture of these enclaves as *mohallas* (italics) in an urban setting, as an extended enclave of the rural caste societies. The *mohallas* or neighbourhoods, according to him, gave the Indian urban market its heterogeneous character of clustered trades.[69] Typically a *mohalla* was a mixed-use area of

residential and commercial activity that also contained its own mosque, temple and school. He writes that in Calcutta, several *mohallas* were contained in a *'Para'* defined as an area approximately ¼ by ½ mile, deriving its sense of identity from a physical feature, a *bagan* or garden, *pukur* of pond or a bazaar.[70] He has not mentioned the other features like drainage sanitation and sewage, which might have involved the local government's well-intentioned policies to be backed by financial considerations. In fact, the identity of a *mohalla* was often moulded by the colonial imperatives or the immediate necessities of urbanism. New questions were raised regarding the aesthetic and sanitary ambience of the city. Modern western education was regarded as one of the mediums to convince the people of the 'good habits'. It reminds me of the scholarly discussion of Samiparna Samanta on the slaughterhouses in early Calcutta. She refers to the emergence of 'speciesm' (dominance of human species over animal species) in modern Baconian Science and the new attitude towards cruelty and beautification of the slaughterhouses in Victorian England and the colonies.[71] She argues that the new attitude was closely related to the development of towns and the emergence of an industrial order in which animals became increasingly marginal to the processes of production.[72] She comments satirically that the agitation against cruelty to animals did not begin among those directly involved in working with animals like the butchers, farmers and the cart-drivers. Rather the new sentiment was expressed by the well to do townsmen, who were away from the agricultural process and who thought of animals as pets rather than as working livestock.[73] In Calcutta, the story exposed the dilemma of a colonial government to address the requirement of the army and the culinary fashions of the administrative officers together with the pressing need for sanitation and hygiene in a growing metropolis.[74] The embarrassment about meat-eating provides an instance of how a growing number of people had come to find man's ascendancy over nature as increasingly abhorrent to their moral and aesthetic sensibilities.[75] Let us come back to our discussion from animals to the people below the poverty line. In the governmental levels there were contradictions regarding their perception of pollution,

but they were a necessary evil, indispensable for urban development. So, some actions were regularly initiated to improve the municipal conditions of the city.

How to Cleanse? The State Actions in the Eighteenth Century

The Charter Act of 1727 set up a Corporation which exercised judicial rather than municipal functions. The principal duty of the Corporation was to collect ground rents and town dues and to make occasional repairs of drains and roads.[76] The Corporation entrusted the civic duties in the hands of the zamindar who could not function for the so-called 'lack of funds' and other problems.[77] Consequently, the city of Calcutta, with its streets, lanes, huts and houses, became notorious for its insanitary condition. The town was thus described by William Mackintosh as early as 1780s:

> It is a truth that from the western extremity of California to the eastern coast of Japan, there is not a spot where judgment, taste and decency and conveniency are so grossly insulted as in that scattered and confused chaos of houses, huts, sheds, streets, lanes, alleys, windings, gulleys, sinks and tanks, which jumbled into an undistinguished mass of filth and corruption, equally offensive to human sense and health, compose the capital of the English Company's Government in India. The very small portion of cleanliness which it enjoys is owing to the familiar intercourse of hungry jackals by night and ravenous vultures, kites and crows by day. In like manner, it is indebted to the smoke raised on public streets in temporary huts and sheds for any respite it enjoys from mosquitoes, the natural production of stagnated and putrid waters. But while the smoke, issuing from numberless places, saves the inhabitants of Calcutta from one evil, it subjects them to another; for by endeavoring to shut out pure air at the hours of retirement, when its use is most essential to respiration and health''.[78]

The paintings of Desmond Doig on old Calcutta show that the white town was comparatively clean, while the black town, where the zamindars built huge palaces, were overcrowded with clumsy bazaars and unhealthy polluted slums, where the menials lived.[79] The colonized

bourgeoisie planned the black city without any concern for cleanliness. L. De Grandpre, who visited Calcutta in 1789 and 1790 writes about the city thus:

> the condition of the town itself is disgustingly unclean. Most of the streets have a small canal on each side, serving as a drain both for them and the houses that could not otherwise be inhabited, on account of their dampness; for the Ganges, in the great swells, rises to the level of many of the streets. These canals, which are a foot and half, and in some places two feet wide, and not more than three deep, are reservoirs of filth; that emit the most unwholesome exhalations. Such animals as die in the streets or in the houses are thrown into them, and they lie there and putrify.''[80]

He also saw that dead bodies of poor people were thrown there, thus making the canals more polluted. He complained as early as the 18th century: "The natives are sufficiently cleanly as to their persons and houses; but, having removed from the latter everything which would occasion filth, they conceive themselves to have done all that is necessary. They have even their ordure at the door or in the street, and, though they complain of the stench, will not give themselves the trouble to remove it.''[81] John Barleycorn, one of the early members of the East India Company composed the following poem on the late 18th century:

> Where Music different from the Notes
> That Warble from Italian Throats
> With ceaseless din assails —
> Where crows by day and frogs by night
> Incessant foes of calm delight.
> Croak their discordant lays.
> Where insects settle on your meat.
> Where scorpions crawl beneath your feet
> And deadly snakes infest.
> Mosquitoes ceaseless testing sound
> And Jackals direful hours confound
> Destroy your balmy rest."[82]

An entry in the Company's account for October 1703 shows that sweepers had been engaged only to serve the white town.[83] On 10th march, 1707, the erection of irregular buildings surrounding the Fort William was forbidden by an order. In 1752, the jungle near Calcutta was ordered to be burnt down to be used for burning bricks. In 1751, the zamindar was directed to "cut down all the old trees and underwood in and about the town."[84] Complaints were made in 1755 that owing to the washing of people and horses in the great tank it had become very offensive.[85].

In 1757, the British settlement in Calcutta fell a prey to a severe epidemic, and Major Carnac complained to Clive of its unhealthiness for the troops, and an order was passed that no troops were to be landed in Calcutta.[86] In 1785 the town was divided into thanas or police stations for municipal purposes and a new system of conservancy service was introduced. The complaints of the public for inefficient control of nuisances and thefts were also recorded.[87] On Thursday, June 9th, 1785, a notice was issued by the Commissioner of Police, who "found it necessary to make sundry alterations in the mode of conducting the duties of scavengers of the town of Calcutta.''[88] In spite of these arrangements, the street nuisances continued unabated. In the Calcutta Gazette of Thursday, October 19th, 1786, it is again announced that "the nuisances in the streets are of late loudly and generally complained of Dirt and rubbish of every kind are permitted to be before the doors of the inhabitants in a most…offensive manner."[89] The Charter Act of 1793 provided for the setting up of the Justices of peace of Bengal, Bihar and Orissa but as usual, more time was spent for judicial rather than municipal functions.[90]

The Nineteenth Century State

Wellesley, the Governor-General, gave a lip-service to the sanitary condition of Calcutta. On 16 June, 1803, he remarked thus; "It is a primary duty of the Government to provide for the health, safety and convenience of the inhabitants of this great town by establishing a comprehensive system for the improvement of the roads, streets, paths, drains and watercourses and by fixing permanent rules for the

construction and distribution of the houses and public edifices and for the regulation, of nuisances of every description."[91] Accordingly, a Town Improvement Committee of 30 members was formed to carry out the physical improvement of the city. In 1814, the Committee's activities were handed over to the lottery Commissioners, empowered to raise funds by lotteries. Since 1793 it had been the practice to raise money for public improvement by means of lotteries.[92] It is indeed sarcasm when one thinks about the huge drain of wealth made from the port of Calcutta and the quotable quotes about the British civilizing mission and the practical scenario of lack of funds for urban development. In 1817, the Lottery commissioners gave place to the Lottery Committee and few municipal works were undertaken. Arrangements for watering the streets were thus introduced.[93] In 1836, the Lottery Committee succumbed to the public opinion in England which condemned the method of raising money for municipal purposes.[94] Ultimately the Bengal Municipal Act of 1848 empowered the Improvement Commission to collect revenue for sanitary works.[95] Under the Calcutta Municipal Act of 1863, the municipal government imposed a water-rate and the house-tax was raised to a maximum of 10%. In 1864, the first Health Officer of Calcutta was appointed; the function being the supervision of surface conservancy and condition of roads. Inspectors of Markets acted as his general assistants. Six Registrars of Births and Deaths were also appointed. The Calcutta Corporation was further reconstituted by the Municipal Acts of 1876 and definite sanitary obligations were imposed by the Calcutta Municipal Act of 1923.[96] The manipulations were mandated to construct toilets in the slums of Calcutta, but the toilet habits of the people could not be changed so easily.

Although no comprehensive measure was undertaken from the beginning of town planning, there was a gradual, yet haphazard awareness towards the western notion of public health and pollution in Calcutta. The Act of 1876 provided a reserve fund for the maintenance of a police force and for the pushing on of underground drainage system throughout the town area or for the proper removal

of sewage from the town and for the water supply. Few brick sewers were erected to run along all the main streets and pipe sewers along lanes and alleys.[97] In 1860, the scheme for supplying the town and the suburbs with pure water was sanctioned by the local Government. To get a supply of the river water free from salt and all possible floating sewage of the metropolis, a pumping station was raised at Palta, two miles north of Barrackpore where water was raised to a large vat and purified by exposure, subsidence, and lastly by filtration.[98] The pure water was then conveyed to the town through large and closed iron pipes by gravitation then it was stored in a large closed reservoir, and by the agency of strong force pumps, it was distributed. By 1870, the pipes distributed water along 418 streets only, all of which taken together contained 511 hydrants.[99]

The First Environmental Law 1905

Such measures were continued in the 20th century. The Government was concerned about environmental pollution, due to smoke and untidy water. Earlier, in 1896, the *British Medical Journal* noted that the drainage system of the town area was extremely defective.[100] Later, the Bengal Smoke Nuisance Act, which was framed in 1905 "for the abatement of nuisances, arising from the smoke of furnaces or fire-places in the towns and suburbs of Kolkata and in Howrah and other areas of Bengal", was passed as the first law for protecting nature in India.[100] In the year 1905, the whole of Bengal was caught up with the tide of the widespread mass movement that followed the partition of Bengal. Amidst the turmoil, conspicuous for the moment, was born in Calcutta, the Bengal Smoke Nuisance Act, and its main purpose being to preserve the dazzling whiteness of the fine huge white-marble structure of Victoria Memorial Hall.[101]

Soon after being passed, the Act was made official. The British were serious about its implementation. An independent 'Smoke Nuisances Commission' was set up under the Commissioner of the Presidency Range. Its functioning was supervised by the Chief Inspector of Smoke Nuisances. The Commission was, however, later merged with the West Bengal Pollution Control Board after

independence. In the 18th century wood, particularly Sundari wood was used for cooking; coal came much later. In 1875-1876, coal was distributed by the Government almost free of cost to avoid excessive smoke of wood.[102] But these did not reach the common people.

The People and their Houses

However, the municipal activities of early colonial Calcutta did not suit the needs of the general people, the number of which was increasing. The population grew most rapidly during these early years of British rule, multiplying nearly tenfold during the forty years from 1710-1750. Housing statistics show that although the population in the old town area increased about 50 times in the 18th and the 19th centuries, the number of houses increased only 11 times. The population of Calcutta was estimated in 1710 at 10,000 or 12,000 persons.[103] In 1831 Captain Steel, the Superintendent of Police, made a census of the population of the town which showed that it contained 70,076 houses, having 187,081 inhabitants. On 1st January, 1837, Captain Birch, the Superintendent of Police showed that the total population of the town had risen to 2,29,714, of whom 1,44,911 or 63% were males and 84,803 or 37% were females, 28% were under 20.[104] The population was Hindu male and adult in a majority but there were other groups as well. Though these figures are not absolutely reliable, these offer a good index of Calcutta's growing population. The number of the people increased due to the fact that the city was fast developing as a heterogenetic centre of activities. There were daily, monthly and regular commuters and the people flocked in rented houses and slums in huge numbers. According to Mr. Beverley, the Superintendent of the Census, 1881, "in 1820, most of the roads in the town were still made of earth, a small expenditure of Rs. 25,000 a year was sanctioned for the purpose of a gradual paving. There were in 1849, 5950 one-storied, 6,438 two-storied, 721 three-storied, 10 four-storied and 1five storied buildings.[105] These statistics cannot be taken as a sign of growing prosperity for all inhabitants. By 1881, the old town of Calcutta was expanded beyond recognition and a new town, including some of the erstwhile suburbs had emerged. Beverley writes, "The boundary

line which divides the municipality of Calcutta from that of the suburbs…is more or less artificial." The Census of 1891 records the population of Calcutta and its suburbs as 7,65,510. Of this, 30.5% were city-born while the rest were outsiders.[106] The Census of 1901, the most reliable of all, records the population as 808,969 and with suburbs it goes up to 942,144.[107] In spite of this rapid urban development, a rural-urban continuum was found with ponds, paddy fields, huts and narrow roads in the physical site of Calcutta. Officially, the erection of thatched huts in Calcutta had not been permitted since 1837 but that could not prevent the overcrowding in slums or construction of illegal bustees. The newly communicable roads and the development of the railways brought more people in the city since the middle of the 19th century. In 1879-80, the Lieutenant Governor pointed out the necessity of improving the condition of the slums. Some attempts were made to tackle the problem of bustee reclamation but those efforts were not sufficient to meet the problem. The problems of the bustees, however remained acute and took more complex shapes with the turn of the century.[108]

The expansion of the city did not display any concern for the conservation of the eco-system. The centrifugal spread of Calcutta towards its hinterland exhibited a spatial pattern which offered an inadequate scope for a healthy lifestyle and leisure for its inhabitants. The haphazard growth overcrowding the existing settlements, high residential density, emergence of hutment colonies, squatter settlements and slums in Calcutta, all seemed to offend against the artist's notion of a landscape as a cultural imagery of a sustained development. The encouragement of this unplanned growth on the biosphere, the physical environ which every species, human or animal needed for survival, had a steady decadence in Calcutta. The deprivation of the basic essential services like clean, lighted roads, water supply, drainage and sewerage, solid waste disposal, transportation, healthcare, which determined the environmental quality of life was never sorted out in a planned way.

This early history of urbanization in Calcutta takes into account the number of mud and concrete houses, main roads, lanes and by-

lanes, and the other minute details of the early municipal administration, to find out the gaps between notions of development and pollution. The accommodation of an increasing population required a constant sprawl of the city into its hinterland. In this context the narratives of the orientalists, on early Calcutta, give us the artifacts of a 'virgin city', an otherised imaginary space, ready to be urbanized and civilized by the fast progressing occident. The very perception of a developing western city, with all civic amenities, can be put to question in the discussion. The orientalist gaze itself suffers from a proper approach towards an overall growth.

Whether the orientalists or the later administrators, none had speculated a proper sanitary design to suit the physical growth of the city. The gradual disappearance of the water bodies and ponds from the city and the filling up of wetlands for the sake of construction and unplanned expansion were happening since the emergence of the so-called city of Calcutta. The inhabitants of Calcutta never benefitted from it while the colonial government did not bother for the ecological disaster.

The Intelligentsia

By mid 19th century, the city was drawn more closely into the hub of colonial and trans-national capital investment which brought more migrants in the place. The port facilities allowed the British to import finished goods and export raw materials and to expand international trading activities in India. The polluted city has been vividly cited in the contemporary literary documents. Throughout the 19th century, the intelligentsia of Bengal picturised the dirty city in various ways, the language of expressions being very satirical, varied and interesting. The literature also exposes the ambivalence and confusion of the local elite on the concept and nature of pollution health and urbanity. So far as the notion of public health was concerned, the British policy was one of modern improvement, but the Indian people were divided regarding their allegiance to the western notions of public health and modern techniques of sanitation. Pearichand Mitra, the famous Derozian scholar, writes in his *Alaler Gharer Dulal* in 1858 that the

Englishmen had the quality of making their residences neat and clean.[109] He comments that due to this cleanliness, diseases were gradually reduced in Calcutta and complains that the Bengali people did not realize it willfully. He referred to the stinking drains near the house of one *babu* named *Lakshmipati*.[110] The eminent brahmo reformer Sivnath Shastri, wrote in his *Ramtanu Lahiri o Tatkalin Bangasamaj* that each locality had two to three ponds with unhealthy, stinking waters, which were the sources of fever and the people from the mufassil suffered from dysentery after coming to Calcutta.[111] The disease was known as *'lona-laga'* in *Bengali* which meant a disease due to the touch of salt. He added that there were wide drains filled with stinking mud by the side of the streets, and once a rogue elephant had fallen into such a ditch and was half drowned.[112] Mahendranath Dutta writes in the end of the 19th century that Calcutta was infested by vultures in the day time and jackals in the night. The jackals used to enter their houses to steal the cooking pots. The area was full of banyan and coconut trees. He wrote about the disturbance of the monkeys and described the pathetic condition of the streets, often covered with bones of dead bodies.[113] He added that one would get one's feet pricked by such bones lying along the road by the Ganges.[114] These scenes did not suit the cultural ambience of the city, busy with the social and religious reform movements and the associational politics of contemporary Bengal. The Bengali *bhadralok*s were gradually becoming conscious of the benefits of western concepts of hygiene, but this issue was never taken up as an agenda of reform. A series of books and articles in the vernacular were published since the mid nineteenth century, highlighting the western notions of science, medicine and scientific living. Mention can be made of journals like *Swasthya, Swasthya Samachar, Chikitsok o Samalochak, Chikitsa Darpan, Chikitsa Sammiloni, Chikitsa, Garhasthya Bigyan* etc., which were directly addressing health issues. Other journals like *Probasi*, *Bangalakshmi*, *Bamabodhini*, *Bangamahila* had also regularly published articles on health. In fact, 'public health' comprised an important aspect of 'print culture' in contemporary Bengal and it had an impact on the *bhadralok*

society. Still, the roots of tradition and superstition were so deeply entrenched in the mindset of the people that it was very difficult to uproot the old ideas completely in the daily living. Bhubanchandra Basak in his *Jalpanbidhi*, published in 1884, suggested the people, the modern ways of drinking pure unpolluted water. The suggestions ironically contained a combination of ayurvedic and allopathic rules, which hindered the development of pure western habits. Similar combinations are found in articles liked "Rogir Proti Upodesh", published by Satish Chandra Lahiri in 1907, "Abyartho Cholera O tadanusangik Upasarger Pratikar", (1928) by Arunoday Mukhopadhyay. Pradip Kumar Bose, in his compilation of late 19th century Bengali periodicals, refers to numerous such writings on personal hygiene, cleanliness, food, water, use of disinfectants, vaccination schedules for the improvement of public health and institutions. The writer refers to the protests and resistance of the people against vaccinations and anti-plague measures. The clinging of the people to the religious ritualism of *Sitala* in pox and *Olabibi* in cholera, the regular use of amulets and the use of *totkas* like *jalpoda, telpoda*, *jharphunk* etc. indicated the power of superstitions and the strength of the indigenous belief systems. There were confusions regarding personal hygiene and use of toilets. The themes which were highlighted in the famous periodical "*Swasthya*", published by Durgadas Gupta since 1901 exposed this ambivalence of the Bengali intelligentsia regarding maintenance of public hygeine. Greater emphasis was obviously given to new western ideas of cleanliness, but the nostalgia for 'indigenous' notions of purity was never completely lost. Subhas Chandra Bose, the Mayor of Calcutta in the 1920s went in so far as comparing the polluted city with the politics of the polluted nation. The issues of civic amenities and public health were sites of political debates between the colonial government and the local elite and the conflicts of opinions and interests within the intellectuals were exposed. It was also clear that no serious efforts were undertaken to improve the living condition of the common people.

The People from Below

Sumanta Banerjee argues rightly in this context that public space in 19th century Calcutta became a new area of contention between the rulers and the ruled. It was a conflict between the customary laws of the natives or the right to common space and the new laws necessary for urbanisation.[115] The British administrators imposed a code of conduct which criminalized some street professions like begging, or soliciting by prostitutes on the main roads or occupation of pavements by vendors and street entertainers. The rural poor who served as menial artisans and industrial workers in the city were forced to change their traditional habits and conform to the behavioral norms of citizenship that were enforced by the colonial rulers. Banerjee compared the streets of Calcutta and the black town in general with the backyard of Victorian London and found similarities in the Government's mode of controlling public behavior through municipal reforms and policing in Calcutta.[116] The reforms affected some of the sanitation-related habits of the poor people of the city. Formerly, due to the availability of huge open space surrounding the villages, the people used to go to the fields for toilets, while the human excreta was incidentally transformed into natural fertilizers. This space was naturally not available in the city and the insufficient alternatives provided for the people did not suit their habits and cultural values. Conflicts arose over the use of toilets or construction of enclosed privies, 'chalaghars' or thatched huts and keeping of horned cattle.[117] Thus the rural population of Calcutta was forced to accept unfamiliar and alien urban norms of lifestyle, not only without being provided with alternative means of disposing waste or of building homes, but was also penalized instead as criminals for violating those norms.[118] Moreover financial stringency did not permit the Government to provide these people with better public amenities like clean public privies and better housing facilities.

The situation went unchanged in the later periods. It resulted into a general degradation of public health and the spread of diseases. Undoubtedly one cannot expect anything better in a colonial situation but the British model of urban planning and development was followed

in the same manner even after independence. The Calcutta Corporation (1876) and the Calcutta Improvement Trust (1912) founded in the colonial period, failed to provide a sustainable living to the slum-dwellers. The colonial hangover is still on and pollution has increased its pace. The majority of the intelligentsia looked to the city's garbage from the other side of the hedge; from a distance which would not, as if, touch or affect them. They served as agents of beautification and urbanization, silently pampering the dominance of western cultural superiority in their own mindsets. In spite of their own experience of a loss, the slum dwellers were made to understand that the beautification of the city would require their removal, they had often appropriated themselves to the language of the other. Otherwise, in their general perception of purity, health and pollution, they adhered to drastically different values, which were related to their distinct religious and moral ethics.[119]

The story of colonial health policy has been narrated by other scholars earlier. The present essay highlights the growth of the city and its environmental history along with the analysis of the public health policy of the British in a question of comparison between the pollution ethics of the orient and the occident. What is regarded as dirt in a given society is any matter considered out of place in the other. The difference between the sacred, the clean and the unclean is linked up with one's belief systems and the Indian situation was very complex. It was narrowly aimed at improving health of European army or native workers. The entire public health policy was too technical in design and implementation and there was a heavy reliance on technology to deal with health problems. That was also true about the public health policies of England in the nineteenth century. Scholars like Roy Porter have shown how public health in England depended on engineering and not on medicine. Cleaning up of the towns was always a priority for Chadwick and his group. This meant the provision of two things: a plentiful pure-water supply, both for drinking and for flushing away waste, and the provision for a system of underground main drainage, to ensure that waste was really flushed out of towns, to profit-making sewage farms, before it bred pestilence. Roy Porter

argues that in mid-Victorian London, 'miracles of civil engineering' were set up in the water and drainage systems. This was never happening in a colonial set up like Calcutta with so many financial and other constraints.

In fact, colonial public health was based on the idea that the local people were inherently unhealthy and knew nothing about public health. This complexity ultimately hampered the growth of the city as a clean entity. The public health programme of the 19th century was retained in the hangover of the 20th century. It comprised a site of conflict between the elite and the colonial rulers and the indigenous intelligentsia exhibited a skepticism regarding the implementation of a thoroughly western medical policy. That was an obvious consequence of colonial rule in Bengal.

In this entire narrative, there were significant moments of change. There were initiatives of 'constructive imperialism', evident through the founding of hospitals in Calcutta by the colonial Government throughout the nineteenth century. Also, cases of 'imperial institutionalization' like the establishment of the Calcutta School of Tropical Medicine in 1914 had an 'independent' positive contribution towards the development of public health. Medical researchers in the colony are also worth mentioning. The internal tensions of the colonial authority exposed the differences regarding the implementation of a single-minded public health policy and threatened the future of a 'medical imperialism'. The colony was a constant site of experimentation and research. Finally, there was also a grand narrative of the gradual 'Indianization' of the western public health measures in the 'tropical' city of Calcutta. That is a different story altogether but that could hardly improve the environmental scenario of the city. The economic tensions of colonial rule remained as a permanent blockade.

Notes

[1] The present author had discussed the issue in details. See, Mahua Sarkar, ed. *Environment and History: Recent Dialogues*, New Delhi, Gyan Books, 2007, Introduction. Also for details, Subhasis Biswas, *European Environmentalism in India: Experiments, Expressions, and Ideologies,(1861-1947),* Germany, VDM Verlag & Co., 2010.

[2] Mahua Sarkar, *'Environmental Crisis and Human Rights: A Historical Pespective'*, in Mahua Sarkar & C.Palit eds. *Indian Vistas of Environment*, New Delhi, Kalpaz 2007.

[3] Webster's *Ninth New Collegiate Dictionary*, U.S.A., Merriam-Webster Inc 1990, 911.

[4] Suvira Jaiswal, *Caste, Origin, Function and* Dimensions *of Change*, New Delhi, Manohar, 2000, 8-9, 34, 39, 46.

[5] *Ibid*., 230.

[6] Mukundaram, Kavikankan Chandi, ed. *Srikumar Bandyopadhyay and Visvapati Chaudhuri*,Calcutta, University of Calcutta Publications, 1974.pp., 345-46. Cited in Richard M. Eaton, *The Rise of Islam and the Bengal Frontier1204-1760*, India, OUP, 1997, 101.

[7] *Ibid*.

8 Sukla Das, 'Concern for Environment: An Early Indian Perspective', in the *Journal of Ancient Indian History*, Kolkata, University of Calcutta Publications, 2000-2002, volume-21, 136-40.

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"The Child to Avoid Fire; by allowing it to Burn Itself"[1]*: Public Health and Tuberculosis in South India, 1898-1947*

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Colonial Public health policies has specific characteristics as many factors influenced after the great Plague epidemic-1890.[2] State regulated medicine enforced especially preventive measures and quarantine policies against epidemic diseases viewed as a powerful tool of domination of indigenous people and social control.[3] However, the hegemonic nature of public health policies was not confined for long. Perhaps forced/cohesive polices were slowly transformed and the British state leaves out the subject of health after the decentralization of powers. In view of these changes, this paper attempts to understand the colonial state medical interventions concerning tuberculosis in South India. It argues that the public health measures were selective, not uniform, but mediated by colonial "priorities" and the nature of the disease. The lone apprehensions to control epidemics constrained further it led to the spread of other infectious diseases like tuberculosis. The British colonial government had no cogent health policies and its interventions during emergencies due to epidemics like plague, cholera, smallpox, and malaria often turned into coercive campaigns which were resented by a large section of the public. Colonial state-operated and functioned with the "rule of difference" to control infectious diseases particularly after the great plague epidemic and these were contingent upon changing socio-cultural, political, and economic conditions. Public health initiatives specific to tuberculosis were not concrete either for disentangling the root causes of the disease.

Public health measures specific to tuberculosis were evolved with the initiative to establish sanatoria in south India only from the year 1910. Both the colonial state and non-governmental agencies

particularly Christian medical missionaries, philanthropic organizations and individuals took initiatives. One such initiative was the establishment of institutional care-sanatoria, dispensaries, and clinics to provide medical care for tuberculosis patients. Other approaches were preventive and educational measures. However, these measures were entirely different in their nature of implementation from the policies that were adopted to deal with other epidemic diseases of the late nineteenth century. Control measures intended for tuberculosis emphasized education more than forceful preventive measures. Sanitary and public health officials realised that providing institutional care alone was not sufficient to control the disease. It needed various other control measures.

Significant changes took place in India in the political, economic and social spheres in the last decade of the nineteenth century. These changes directly and indirectly influenced the shaping of health policies and their implementation. Politically, the national movement was gaining strength in the whole of India. Various organizational and structural changes were also taking place in the colonial administration. In 1882, the decentralisation of administrative power opened the gates for Indian participation in the policy formulation and implementation process at the local-government level. As Lord Rippon stated, "if Indians could not with safety be educated and allowed a share in the management of their own local affairs, then the days of British rule were numbered and its justification had ceased."[4] The later reforms Act of 1919 extended political powers for local bodies and the subject of 'public health' was transferred to provincial governments. In effect, the local governments were able to formulate policies and implement them in their own way rather than follow earlier central government imposed policies. These "liberal political reforms" created a bridge between local people and the British by incorporating and giving high positions to Indians in the sanitary and public health, and local self-government departments. These changes helped local elites actively participate in policy formulation and also in implementation of health measures at the local level.

The medical thought and action had also changed after the great plague epidemic of 1896. Sanitary and health officials tried to bridge the gap created by the anti-epidemic measures, which threatened their political existence. The anti-plague measures had never before interfered on such a massive scale in a systematic way in domestic, social and religious spheres.[5] It showed that by the first decade of the twentieth century, military and Europeans were not under any great threat of epidemics as these had been brought under control. There was also a steady improvement in the health of the army and that of Europeans. The mortality rate in the army diminished from 1899, showing even more remarkable improvement after 1904. For instance, during 1899-1908 the sick rate in the army had drastically come down from 5776 men per year to 2900 men.[6] Consequently, later health measures were not implemented in such an interventionist way. Health officials also recognized that without the cooperation of Indians it would be difficult to implement public health and sanitary policies. From interventional health policies the focus thus shifted to new rationalizations and justifications for the long-term sustainability of the colonial state in India. For the first time, preventive measures (essentially sanitary and public health campaigns) shifted attention from public cleanliness to personal hygiene.

Medical scientific developments of the last quarter of nineteenth and early twentieth centuries also coincided with the transformation of colonial state public health policies towards control of tuberculosis. One such was the germ theory of Robert Koch (1882) which helped to extend the knowledge and understanding of a wide range of health problems in India. Health officials now focused attention on the factors for the spread of tuberculosis. The change of nature of policies was not just due to the scientific discovery but also due to the fact that the nature of the colonial state itself changed after the strong resistance witnessed from the people when forceful epidemics control measures were implemented.[7] The colonial state now avoided interfering in matters of socio-cultural practices to keep out the tensions which marked earlier epidemics. It also tried to claim universal legitimacy of application of western medicine by creating institutional

arrangements and formulating policies. The medical and sanitary officials engaged with the problem in a reformed way. They advocated a different set of ideas in favour of public health rather than the earlier anti-epidemic policies. Public health covered army and Europeans as the prime concern; the colonized were considered as economy or wealth of the empire. From this perspective, W.G. King, Surgeon General with Government of Madras, said that "if human life is valued as a matter of political economy, and if trade is a factor in the prosperity of India, a policy that would advocate letting plague *rip* until the people help themselves is unsound."[8]

After identifying that tuberculosis was in no way less prevalent than the other epidemics, medical and sanitary officials urged for distinct measures to control the disease. The government of India gave instructions in 1910 to all provincial governments regarding the importance of measures towards control the disease.[9] C.P. Lukis, Director General of IMS, argued that India was "far behind the rest of the world in attempts to grapple with this disease." He further stated, "in near future the problem connected with the prevention and cure of tuberculosis in India would assume even greater proportions than those presented by plague."[10] "A crusade against tuberculosis" being done in Britain should follow in India, along with important measures such as instructions in schools, special out-patient departments for tuberculosis cases, attending to patients at home, treatment at special camps or other convenient places.[11]

Preventive measures against tuberculosis were a part of the improvement of sanitation which were brought in as part of the agenda proposed by sanitary officials and medical practitioners in the Second All India Sanitary Conference of 1912 held at Madras. In this conference participants stated that "no preventive measures will check the ravages of this terrible scourge, unless effective measures are taken to improve the housing of the masses".[12] The Conference considered "no object more humane, no measures better calculated to brighten the lives of the people and reduced the mass of human suffering than the provision of a pure and scientific water supply, when such does not exist."Adding to these, sanitary and medical officials approved that

"travelling dispensaries have proved a great boon not only in bringing medical and surgical relief within reach of the rural population, but also in winning the confidence of the people."[13]

From 1910 onwards the Central government proposed to set up medical institutions and placed it before the Governor-in-councils and provinces for consideration. While proposing this, the Central Government notified that it was an urgent need to establish institutions in this country to save "many valuable lives."[14] The medical practitioners and health officials made efforts to control epidemics. But their focus was much more on managing the chaos created by the diseases which were known to them so as to protect the state's political and economic interests. Various agencies too took part in bringing out the neglected problem of tuberculosis.

The Government of India discussed with Governors-in-Council about the possibility of anti-tuberculosis work in all provinces, as the existing measures were not sufficient to combat the disease. The same Council emphasized the necessity to wage an active crusade against the bacillus which causes the disease. The line on which such a campaign would be conducted in all provinces was as follows: i) give definite instructions in schools, conduct special classes for tuberculosis infected children, ii) establishment of open-air schools for children who were not infected, iii) opening of dispensaries and formation of out-patient departments for tuberculosis patients in large hospitals, iv) visit of qualified medical men and nurses to patients' houses, v) open air treatment in special day camps of patients who were able to carry out their work, and vi) formation of a league for the spread of knowledge of the proper prophylactic measures with special reference to the danger of promiscuity and overcrowding and want of fresh air and ventilation in the sleeping places.[15] These proposals were conveyed to all Provincial Governments.

In response, the Madras Presidency government gave in its reply an indication that emanated from W.B. Bannerman, Surgeon General of Madras Government, to carry out such a campaign as was contemplated by the Government of India.[16] The government's brief to the Director of Public Instruction (Madras) said that "we should

begin at the schools, and they are main starting of spreading the infection among children." These measures were intended to stop the disease in an early stage of infection, and "its mode of spread, precautions against its spread and for safety of healthy persons. The instructions had been given that every school child should get one card in which prescribed about the nature of the spread and its mode of spread and precautions against its spread." Every child was expected to learn the contents of the card by heart. Such was the method used as a means for the diffusion of knowledge on tuberculosis to the school children. The Director of Public Instruction of Madras held that it was possible to implement the card campaign which was suggested by the Surgeon General of Madras. The card was printed and hung up in every school. The card contained information on tuberculosis proposed to be given to school children while leaving school and the inspecting officers would ensure they learnt it. The Government anticipated that this measure would create awareness. However, the Local and Municipal Departments expressed doubt that the nature of tuberculosis and its mode of spread were only briefly written on the card. The information displayed on the card would not show "any appreciable influence" on the public. The method of campaign was not effective because "the knowledge so obtained would have very little influence on people's action."[17]

Sanitary and health officials expressed two different sets of viewpoints on the application and operation of preventive measures. Notably, Arthur Lankeseter, who made a first All India Tuberculosis Survey favoured gradual efforts likely to give good results. It was impossible to restructure the sanitary policies of India's cities. It may take "a lifetime and a fortune" to attempt and clean up a single city, thus good results would be expected through "certain new tendencies and efforts in a gradual enlightenment of public opinion, a levelling up of the standard of sanitation throughout the country."[18] He advocated that:

> The questions which we have to decide are, on the one hand, whether the schemes reckoned in Western countries are suitable for adoption to Eastern conditions, and on the other hand, having

regard to the enormous population, and the resources available of men and money, whether it is in any degree possible to apply the methods of the West to the problem as it exists in India."[19]

He further stated that "the pigeon-holes of many Indian offices contain reports and schemes whose main defect has been that of being too perfect for adaptation to actual conditions out here (India)." The general application of practical measures during the world war was hampered due to declining financial aid from both the government and private sources. In addition to this, "for some proposals already made or now to be suggested" Lankester felt that "the time is not yet favourable in view of political and industrial unrest."[20] He urged to go forward with "what is practicable" under these circumstances of "difficulty" in funding medical institutions and schemes requiring large amounts of money. Lankester's survey was done in 1914-1915. Lankester urged for gradual sanitary measures and preventive measures "with what is practicable under the present circumstances."[21] Lankaster shows a clear understanding of socio-cultural and political conditions prevalent in India, as reflected in reports and opinions of medical practitioners and officials which he consulted during his investigation. Though he recommended preventive and educational measures, his emphasis was on educational measures.

Another group of officials and practitioners favoured applying the western curative care methods in India. One among them, C. Frimodt-Moller, superintendent of Union Mission Tuberculosis Sanatorium, Madanapalle, strongly propounded the methods which were used in the West. Since there was a drastic decline in tuberculosis witnessed in Western countries, "the line of attack followed in the West should [therefore] be introduced systematically into India as there are now sufficient proofs of their successful application to Indian conditions."[22] He further stated that "only beginning has been made in the application of our knowledge of tuberculosis to Indian conditions; but, although the task before us is almost overwhelming we have already seen sufficient results to enable us to proceed with courage and determination against what has become one of the foremost scourge [sic] afflicting the millions of India."[23] However even in 1927

the attention paid to TB by the state was inadequate. AC Ukil, Professor of Bacteriology, National Medical Institute, Calcutta, said that "yet its claims (deaths of tuberculosis) have not attracted the measure of attention it deserves from medical men as well as the state."[24] In the discussion of this paper, Dr. C. Frimodt-Moller insisted that the "campaign against tuberculosis should not wait until the condition of general hygiene has improved." He cited the example that the death rate of tuberculosis in France did not come down with the improvement of hygienic conditions when it rapidly fell in England and other European countries where they started direct attack on the disease. It was only after 1914 that France followed such measures too.[25] He acknowledged the impediments associated with the socio-economic conditions, but also pointed out that, "the socio-economic factor cannot be solved in a short time."[26] The difference of opinion among health and sanitary officials and medical practitioners made it difficult to have a clear policy vision. In view of this, *Indian Medical Gazette* editorial (June 1925) warned that "the attitude of fatalistic indifference does not help; a clear knowledge of the true state of affairs and a rational programme for dealing with situation are urgently needed"[27].

Medical practitioners and health officials recommended the notification of disease would be helpful in finding out the exact extent of its prevalence and mortality rate and accordingly preventive measures could follow. Till then the lack of sufficient statistical data on tuberculosis had misled the medical practitioners to believe that tuberculosis was less prevalent in the Madras Presidency. The Corporation of Madras proposed to introduce compulsory notification of tuberculosis first in Madras city and later in the districts of the Madras Presidency in 1913. Only in Bombay, tuberculosis was a notifiable disease from 1903. In Scotland there were rules to support the notification of tuberculosis cases by giving monetary allowance to those who identify tuberculosis infected patients. Such rules would be inadequate in Madras and the health officer of Madras Corporation emphasised the need to formulate new rules. He stated that "we in Madras are still far behind even Bombay, as only four diseases, viz. smallpox, enteric, cholera and plague being notifiable."[28] Further he

urged that tuberculosis being a "danger disease," required "some system of control." This could only be done by making the "notification" of this disease compulsory. It was "essential and preliminary to any useful efforts towards the prevention of tuberculosis." According to him "there must be accurate knowledge of an evil before it can be successfully attacked, and compulsory notification of tuberculosis presents the only method of obtaining accurate knowledge of its prevalence."[29] But Lankester warned that "surely the experience of plague preventive measures has been enough to teach us that India is not the same as Scotland with reference to compulsory sanitation!"[30] Moreover, the majority of Indian medical practitioners did not agree to the introduction of compulsory notification of tuberculosis. During his survey (1914-15) Lankaster had consulted Indian Medical practitioners and they all expressed unanimously that "the introduction of compulsory notification in India at present would be the great mistake; its first effect would be to unite solidly against us the very body of men whose cooperation[30] is most essential, the members of the indigenous medical profession."[31] Sir John Simon, Sanitary officer said a similar thing: "compulsory regulations do not make sanitation more acceptable to the people."[32]

Lankester further stated that "in India where every form of compulsion carries in its train the possibilities of unlawful oppression by subordinates for the purposes of gain, it becomes of special importance to reduce this feature in our campaign to the smallest minimum." Various provincial governments submitted memoranda on Lankester's report on Tuberculosis in India (1915) and it was collectively agreed that "the introduction of any system of compulsory notification would be premature at present."[33] Therefore he concluded that while "public opinion is not yet ripe for any measure of compulsory notification (*i.e.,* by which failure to notify might involve legal penalties), there is yet every reason why the practice of voluntary notification (emphasis original) by private practitioners should be encouraged as far as possible, especially in the larger cities."[34] The notification by private practitioners was almost non-existent in Madras.

The government of India was not willing to make tuberculosis as a notifiable disease, declaring that:

> We can start off in a very definite way to combat the scourge where we know it exists, leaving it to future enthusiasts to devise to search out the cases of which we know nothing by making the disease notifiable. It is probably too early in the campaign to call upon the Government to make tuberculosis a notifiable disease.[35]

Only in the year 1939, tuberculosis was made a notifiable disease through a provision of the Public Health Act of Madras-1939.[36]

Making Disease Public : Inspection, Instruction and Health Propaganda

During this period as a new phase of the dynamism of public health seen and it set a core agenda of medical care of people that protect against "hazard of infection". Protection from hazard came be linked to the promotion of public health by positive means. Medicine as expressing and developing a sense of "social solidarity" through educating people by means of propaganda. Propaganda by means of Exhibitions, distribution of pamphlets lecture with demonstrations, organizing weekly programmes and posters etc. The experts wrote on health related inspired articles in the newspapers, and set lessons in schools, and organized the health tours for better health, sanitation and to create hygiene awareness.

As part of this, educational measures were also introduced for the control of tuberculosis in the Madras Presidency. Early detection of infection of tuberculosis in children was identified as an important method to prevent the disease. School inspection and instructions were introduced to improve school hygiene. This method would help to stop initial spread of the disease among children. C. P. Lukis, Director General, IMS strongly advocated the "improvement of school hygiene" which was necessary to prevent the disease in an early age. This had been paid serious attention in other courtiers during this period.[37] *The Pioneer,* a newspaper, in its editorial (20-4-1910) suggested that it was an "urgency of the question of physical conditions of the people." Further, it pointed out that medical supervision of schools and pupils was one of the most important branches of science of state

medicine.[38] An active crusader against the disease, Lukis said, the steps taken up to the present include instruction in schools, special out-patient departments for tuberculosis patients, attendance on patients' at their homes by nurses, and open air treatment in special camps. Along with these, the Central government proposed the establishment of hospitals for advanced cases "with the principal object of minimising the danger of infection of the healthy and a home in the mountains for incipient cases and necessary grants offered for free sites for airy dwellings to construct on a definite plan for sufferers, and also to form a league for dissemination of knowledge as the proper measures for prophylaxis."[39] Moreover, the Central Government had urged the provinces to organise a medical congress "to decide on definite and concerted action with a view of checking the spread of tuberculosis. The question of the formation of anti-tuberculosis societies, and of improvements in school hygiene and systematic medical infection of school children might be added to the list of subjects for discussion in the Congress."[40] The Government of India also made a resolution in 1913 and stated that "the claims of hygiene are paramount not only in the interests of the children themselves, though these are all important but also as an object lesson to the rising generation."[41] Lessons were taught to the pupils on the subject of elementary health and hygiene principles for a healthy life such as on air, water, food, house, personal hygiene, bath, sleep etc.[42] The government made it mandatory to teach hygiene and general health in all schools in Madras Presidency in 1935.[43]

The government recommended accommodating school children with seats near open windows to get fresh air. However, the Director of Public Instruction said "it is useless to bother about fresh air, etc. if the child is really starving!" He further said that "the well-to-do educated classes are alive to the danger of tuberculosis. There were about a million children in school, of them a great majority belong to the poor classes".[44] A suitable daily meal was proposed with consultation of a medical officer and a school master to be given to such children to overcome the nutrition deficiency. However, different department officials expressed doubt that this proposal would lead to

practical difficulties. Medical inspection, medical attendance, feeding of all poor children and special classes for tuberculosis children were identified as measures for early detection of the disease among children. The Education Department responded on these proposals saying "we have not the slight idea as to what this would cost". Another proposal brought out by the Central Government recommended that medical officials should visit homes of the school children. The officials in the Madras Presidency said that there would no objection from parents to visits being made by officials. It would not be difficult to implement periodical medical inspection of schools. Surgeon General of Madras agreed that this was "no doubt desirable." But he doubted whether medical officials could find time to visit all the schools so often as once a fortnight.[45] He also considered opening of special classes for tuberculosis or delicate children as impractical. Medical officials argued that these preventive measures would not be useful to countries like India. T. E. Moir, Officer of Education Department, recognized that "we are in danger of dissipating energy by trying to emulate rich western countries in the multifarious nature of their experiments in the field of sanitary and social reform." He proposed accurate measures for control of tuberculosis. Therefore he warned that it would be "a mistake to divert money and energy from the effort to create that essential minimum of sanitary and other conveniences which form a decent milieu for daily life." These proposed measures should not be confined to a single town or region but should apply to all villages in the Presidency.[46]

Originally, the scheme of medical inspection of school children was proposed in 1919. Following this proposal, the Surgeon-General of Madras made a proposal to appoint a special medical staff, viz. school medical service for the medical inspection of pupils but it failed to be implemented. Till 1926, the conduct of medical inspection was optional, done on school management's recommendation. It was made compulsory in the year 1926, applicable only to government secondary schools and department schools. When this proposal was made by the government, the managements of schools requested for the approval of the Surgeon General for the names of the medical

men whom they would appoint as medical inspectors.[47] The Government then recommended the appointing of private practitioners for medical inspection wherever university graduates were not available. After one year, the compulsory medical inspection of schools was introduced; it was extended to Government colleges and in 1928 made conditional to the recognition of all secondary schools under private management.

Nevertheless, the existing anomaly led to limiting compulsory medical inspection to government colleges and all secondary schools. The total strength of the pupils was 2.36 million in all educational institutions in the whole Madras Presidency. Out of this, the great majority about 2.10 million were in elementary schools. Many diseases of adult life were an outcome of neglect of ailment in childhood or early youth. Therefore, from 1928 onwards medical inspection was made compulsory in elementary schools. Even this was implemented only in those areas where compulsory elementary education had been introduced. Only 23 out of 82 municipal towns and 5 out of 129 taluq boards had declared elementary education compulsory. This gives an idea that majority taluq boards and municipal towns were out of the realm of medical inspection.[48] This scheme was, as K.S. Srinivas Iyer, LMS, Karaikudi said, "not quite as fruitful as it ought to be."[49] When schools opened after summer holidays, the medical inspectors were asked to do their work and submit the report to higher authorities before October. The students who had defective health were sent to their parents and referred for treatment. But these referred cases were not given the needful attention by the parents. Though this system helped to find affected students it did not enforce proper attention to treatment. Srinivas Iyer suggested that possible solutions could be found only when the school had its own either full or part-time medical inspector. In addition, he argued, students who were defective in health were poor and were not able to afford the necessary treatment. "The government should find ways of providing treatment." Unless this was done, "utility of the medical inspection is lost, and annual examination has only a statistical value."[50] As prevention is better than cure, every school had to provide for the proper teaching of

hygiene and sanitation in all the classes and of physiology in the higher forms, with a physical instructor for games and exercises. Malnutrition was a "serious major problem" for the defective health of students. In Srinivas Iyer's view, "the best way of combating this evil would be to provide a good and nourishing mid-day meal to these pupils." This was introduced in some schools by the Corporation of Madras.[51]

C.S. Govinda Pillai, Health Officer of Madras Corporation in 1928, argued that investment on medical inspection scheme was an "essentially public one". It was "an investment where the dividends are only deferred, for undoubtedly the community will be benefited by a healthier adult population with the increased working capacity and resistance to disease." This had witnessed great progress in other countries. He thus supported the systematic medical examination of children, provision of facilities for treatment of the ailing children and organisation of clinical centres for treating special defects, establishment of X-ray centres for providing treatment, supplying meals, milk and cod liver to the undernourished children, isolating sick children, prescribing exercises in drill and gymnastic classes suitable to individual children and lastly educating authorities on matters of health.[52] The medical inspection was for the early detection and treatment of tuberculosis and arrangements were also made to meet the parents of pupils who were afflicted with tuberculosis and for giving them the necessary medical advice.[53]

A proposal came from the Corporation of Madras in response to an article published in the Indian Express (dated 11th May 1938) suggesting that poor slum children might be taken to the beach tour once a week for a two hours stay. The paper requested the Corporation of Madras to consider this suggestion and give the scheme a trial. Immediately, the Corporation of Madras responded and sent a proposal to the government. The Government considered that the proposal involved very heavy expenditure compared to the advantages that might be conferred by the scheme. The government argued that many slum children were lacking in the more urgent necessities of life, i.e. food, clothing, housing. Instead of the proposed scheme it would

therefore be useful and economical to provide suitable play grounds in the slum localities. An experimental scheme was prepared to provide to the children of three Corporation Schools comprising of about 500 children of slum areas a beach tour**.** But the Standing Committee of Health Department while considering the scheme in January 1939, deferred and desired a comprehensive scheme to be put up. Later this proposal was also sent for consideration of the technical committee of the Provincial Tuberculosis Association in May 1940. The technical committee of the Provincial Tuberculosis Association declared that the proposed scheme by the Corporation was not useful in the prevention of tuberculosis. This would do "more harm than good by exposing the children to infection in crowded buses."[54]

The medical officials and practitioners accepted the fact that for "tuberculosis, far more than in any other disease, prevention is indeed better than cure," as K. S. Sanjivi, of the Government Tuberculosis Institute, Madras wrote in 1937. He quoted the "Times" medical correspondent's criticism of the London council's tuberculosis work which was relevant to India as well. "Our diagnosis is too late, our prevention inadequate and our treatment of small avail, we are neither preventing nor curing, and yet vast sums are being spent each year on the effort." K.S. Sanjivi said "if this is true in England; how much more true it is of India...we neither prevent nor cure; we spend neither money nor effort in quantities for the waste of which we need feel sorry."[55] In 1938 medical officials urged the Public Health Minister to ensure provision for compulsory segregation of tuberculosis patients and the formation of flying squads for the prevention and control of diseases.[56] But these two things did not become part of policy.

The King George[57] Thanksgiving Anti-Tuberculosis Fund Committee meeting was held on 17th February 1938. It recommended the provision of free microscopic examination system at public hospitals and laboratories which had proved to be an effective measure in England and other countries. The Anti-TB Fund requested the Government of India to ask the provincial governments to provide facilities for free examination of sputum on the recommendation of qualified medical practitioners in all public health laboratories and in

all district and taluk hospitals for the benefit of the poor. The Government of India gave instructions to all provincial governments regarding the free examination. However, in response to this, the Surgeon General reported that facilities for examination of sputum already existed in all the government district headquarter hospitals and in almost all the taluk headquarter hospitals in the Madras presidency. No fee was collected for examination of sputum in the District and Taluq-headquarter hospitals. Therefore, as H.E. Short, Surgeon-General said "the introduction of the scheme … will be practically nil."[58]

Tuberculosis being a social disease, it could be "combated successfully only if ameliorative measures on an extensive scale can be undertaken" as improving the general standard of living conditions including housing, nutrition and the sanitation and environment of home, workplace and public places. The Public Health Director said that there was need for "organised efforts" for improving the environmental hygiene[59] but it had not begun even in 1940s. This delay was because of the high cost involved in implementation and people had not been educated "to recognise need for and demand the provision of such important conditions of life." Moreover, the existing public health measures, organisations and institutions in Provinces were in primary stage of sanitary development and were preoccupied fully till 1930 with prevention of epidemics i.e. smallpox, cholera and plague.[60]

The medical policy formulation and implementation towards control of tuberculosis needed more long standing policies. Tuberculosis was considered as social disease because causational factors of the disease were closely associated with economic conditions and socio-cultural practices. The sanitary officials and medical practitioners for the health measures therefore strongly proposed educational measures as one of the legitimate methods of deployment of state sponsored health policies.

By the late nineteenth century the colonial state becomes hegemonic in its nature. The control of non-epidemics does not need rigorous and aggressive policies as diseases like tuberculosis does not affect

the political and economic interestsof the state. After 1896, the state realised that majority of the people were illiterate and they would not be able to successfully implement forceful policies as had been evident in the earlier enforced anti-epidemic measures. On the implementation of various sanitary and medical policies W. G. King observed that, "the only way to deal with an ignorant population is by allowing to be taught by experience."[61]

The colonial state explored for various strategies to overcome the resistance of people whenever preventive measures directly affected the socio-cultural life. The educational measures were intended to bring a change in the attitudes of people and also to conquer the social and cultural prejudice of the society, which were closely associated with tuberculosis disease. In this context W. G. King viewed that:

> "It is obvious that having regard to these divergent conditions (divergent in interests and language) which [are] lightly ignored, no opinion as to when this radical change of mental attitude of the uneducated mass as a result of this 'burn child' policy would occur"[62].

Raghavendra Rao, Health Officer, Corporation of Madras said that these methods were "well-tried and orthodox measures for preventing and controlling infective diseases…we not only need education, which, in a broader sense, should include Public Health subjects, but also sufficient schooling for practising the laws of health less spasmodically and with a more thorough application than hitherto. More than all is the need for the public authority and the citizen to co-operate with each other more zealously and intensively." He further argued that "Public enlightenment and opinion are the fundamentals for any effective sanitary progress." It would be futile to hope to stop contagious diseases "with a Law, a Health Department and a placard" but it could be obtained solely through the cooperation of the people by persuasion, by organisation and by education.[63]

The propaganda method was undertaken by the government as a means to educate the people on the problem of tuberculosis. Education of the public was an important feature in the measures against

tuberculosis. This realisation came owing to strong response that came from people against inoculation and other epidemic measures. The public had no idea of the cause of the disease and it led to negligence of infection of the disease.

The education of the people in the principles and practice of hygiene had been long recognised as an integral part of all advancements in public health administration. Dr. P. S. Chandrasekhar argued that education of the public was "a very important prophylactic measure" to create awareness in matters pertaining to hygiene. This could be carried out through six ways: giving instruction in hygiene and school hygiene to teachers during their period of training, teaching the elements of hygiene in all schools, delivery of public lectures by the teachers and medical officials to parents, delivery of lectures on sanitation in the vernaculars to the villagers by sanitary inspectors, distribution of leaflets in the vernaculars on general sanitation and on the prevention of infectious diseases and publication of the same in the vernacular journals of the Presidency.[64] Missionary doctors also proposed education as an important measure to control the spread of tuberculosis because they believed people neglected the simple and first principles of sanitary laws due to ignorance and customs. The most urgent need was to teach the "values" of sanitation. Indeed it was "*sine qua non* of all combative measures" of tuberculosis.[65] Dr. W. J. Wanless, President, Medical Missionary Association of India, appealed to all missionary physicians and government medical and sanitary officials to co-operate with the Government in carrying out the campaign for the sanitary and hygiene education.[66] The inception of organised measures for the spread of knowledge in matters relating to public health really dates to the inauguration of the district health schemes in 1923.[67] The district health scheme was introduced on 1st April 1923. According to this scheme, district health inspectors had been appointed in each district. Initially the government appointed only 205 district health inspectors appointed while 219 taluqs existed in the Presidency. The duty of health inspectors was inspection of the areas to control various infectious diseases, fairs and festivals and propaganda work.

Since then, the education on public health matters has received increasing attention. After this, each district had its own health service through which propaganda on health matters carried the message into the villages. The propaganda work, done regularly in villages visited by the health staff, not only included lectures, lantern demonstrations and lessons in schools, but also "informal and friendly talks" with people of the villages. This was in addition to the systematic propaganda campaign carried out throughout the presidency. These organisational efforts were aimed at establishing various social networks within Indian society while coordinating and encouraging involvement of the people. Particularly after 1930 the British paid greater attention to public cooperation in implementation of health policies and preventive measures.

The first National Health and Baby Week[68] (14-19th January 1924) was observed with the special objective of drawing public attention for one week to matters of health, to motivate "a sense of personal responsibility for health." The National Health and Baby Week, as Government considered, became a successful programme all over the presidency. It helped to carry out "silent and unseen work" in the way of cleaning houses and streets. The government of Madras made arrangements and appealed to local organisations and people for active participation. It organised a huge campaign in each centre with revenue, educational and medical department officials, private medical practitioners and local associations such as the Indian Red-cross Society, Young Men's Christian Association, Young Women's Christian Association, and Social Service League. The noticeable thing was that it invited to participate in this programme all kinds of religious people and priests of all religions. The press and local authorities then formed committees to gather requisite funds and chalked out a detailed programme of work during the week.[69]

The medical and sanitary officials considered that education of the "public" was important because the measures instituted against the disease would "have very little power of bringing the decline of tuberculosis in India if people do not learn the infectious nature of the disease and its spread." They strongly believed that only education

could change the general belief that existed among the people that tuberculosis was inherited or occurred due to bad climatic conditions. Dr. Frimodt-Moller argued that the measures introduced in India against tuberculosis "have little power" to control the disease unless the public learns about the disease, the nature of infection and how to protect oneself from its spread. To fulfil this goal, Dr. Moller emphasised the need for "a definite press campaign" and formation of a special Tuberculosis Bureau to arrange lectures in colleges, schools, with the aid of subordinate officers of the health department in industrial centres and villages. According to Dr. Moller, "a campaign of education regarding the infectious nature of the disease and the necessity for early treatment is urgently required to stem the increase of tuberculosis in India."[70]

Different means of communication such as cinema, radio, leaflets, pamphlets, press, journals were used to disseminate knowledge against tuberculosis. In 1935, 15 leaflets on tuberculosis were issued in various languages.[71] In 1939, four pamphlets titled "(1) all about tuberculosis and advice to patients; (2) early detections of the disease; (3) Instructions to patients admitted in the government Tuberculosis hospitals and Tuberculosis Sanatorium; and (4) Sputum (phlegum) and how to take care of it" were printed by the Government Tuberculosis Hospital, Rayapettah, Madras for free distribution not only to patients but also to patients' relatives who visited the tuberculosis hospitals. Later these were also translated into Tamil, Telugu, Malayam, Urdu and Kannarese. In English and Tamil each 20,000 copies, Telugu about 10,000 copies and Malayam, Kanarese, and Urdu each 5000 copies were distributed. These pamphlets gave information about infection, which age groups would be affected, source of infection, how the infection is carried, dress, hygiene etc. They emphasised that tuberculosis was not hereditary and it was acquired after birth. The pamphlets also suggested some measures for improving the resisting power of an individual by taking good food, plenty of sunlight and pure air. The early detection of tuberculosis was also propagated with pictures.[72] All these methods were used as

means of the "awakening of the public mind" to recognise the disease. It was recognised as a way of organising the voluntary endeavours for anti-tuberculosis work.[73]

The Health Propaganda Board was started in 1921 and its main aim was to stimulate and promote an interest in knowledge of all matters connected to the general and personal health of the population of southern India. It also encouraged and propagated sanitary and hygienic habits among all classes of people; diffusion of information regarding epidemics and the means to combat them; other objectives pertained to the promotion of public health. Other organisations such as the Maternity and Child Welfare Branch of the Red Cross Society and the Social Service League, the National Health and Welfare Associations of South India[74] organised and conducted continuous campaigns of educating the masses in the general principles of health, personal hygiene and public sanitation, disease prevention and maternal and child welfare. All these organisations played a crucial role in creating an awareness among the masses with regard to maintenance of personal and public health. The health department of the Corporation of Madras was confined only to the city area. The National Health and Welfare Association ostensibly was intended to operate throughout southern India, but its normal activities till 1932 were confined to the city, more particularly to schools and area occupied by the poor and the labour class. The Social Service League had also played a crucial role in working in slums and *cherris* particularly in the Madras city. The Health Propaganda Board prepared the necessary propaganda material and arranged lectures by medical experts. Also all health officials in the presidency gathered and exchanged notes and views at annual and regular provincial health conferences.[75] There were 15 leaflets on tuberculosis distributed in 1935.[76] Christian medical missionaries also played a role in the distribution of leaflets and propaganda about tuberculosis among village people in the form of dialogues between doctors and laymen in villages.[77] Popular forms of art, like songs were also incorporated into the propaganda material. The health songs were on health rules both preventive and curative. The propaganda made during the

celebration of health and baby weeks through songs which used popular tunes enabled to create easy memory among children and uneducated elders on all subjects of sanitation and health including tuberculosis.[78]

The health officer of Corporation of Madras considered TB "purely a social problem as it is more a disease of the poor than of the well-to-do classes." He further stated that "if any great reduction in the incidence of this disease is to be effected, the social and economic conditions of the masses have to be improved."[79] The spread of Tuberculosis was closely associated with social and cultural practices like child marriages, Gosha (purdah) system, and joint family system, frequent and ubiquitous spitting which needed to be reformed. For example, the number of gosha women who were affected with tuberculosis was three times higher than others. The practice of gosha was one of the major causes for the spread of infection among Muslim women. Gosha patients would rather die than be examined by a male doctor. For this, the government decided to appoint a lady practitioner who was a specialist in tuberculosis.[80] The joint family system and early marriages could be eradicated by making laws and creating awareness. The social reformers sought to bring social reforms to uplift women which would ultimately help to prevent the disease.[81] Lankester had argued that the social and cultural roots of the disease need to be eradicated and this would not be possible by merely adopting western methods in India. He warned the medical and sanitary officials that "any practical measures would be doomed to disaster which were founded merely upon the Western experience, and not corrected, with the most sympathetic caution, by reference to Eastern prejudice and feelings."[82] The "adverse social customs should break down" argued Frimodt-Moller, Superintendent of Union Mission Tuberculosis Sanatorium, Madanapalle without which curative and preventive measures would give "disastrous results."[83]

To conclude, preventive and curative measures were begun only after 1910 with the initiatives for the establishment of institutional care for tuberculosis patients. Unlike other epidemic diseases, tuberculosis did not get much space in the policy framework as it did

not affect the core organs of the colonial state. The measures intended for tuberculosis were entirely different from the earlier anti-epidemic measures, which were the result of the reorientation of health policies during the late 19th century particularly after the great plague epidemic. The implementation of preventive measures was also slow and sporadic due to lack of active state initiative and inadequacy of resources. However, the state escaped its responsibility after the subject of "public health" transferred to provincial governments particularly in financing the health. The semi-governmental, private agencies and individuals became active players against tuberculosis scourge.There were no concrete policies for solving the problems of overcrowding, poverty, malnutrition, housing, town planning etc., which were considered main causes for the spread of the disease. The measures focused more on education of the people than on therapy and curative care. The educational measures were intended to educate the people and the patient to mould them into responsible subjects aware of self-hygiene with a sense of responsibility. The preventive measures were carried out through propaganda, exhibitions, distribution of pamphlets, and newspapers, active participation of private organizations and associations.

Notes

[1] Mark Harrison, *Public Health In British India, Anglo-Indian preventive medicine, 1859-1914*, Cambridge History of Medicine, Cambridge University Press, 1994, pp. 2-3.

[2] D. R. Headrick, *The Tools of the Empire: Technology and European Imperialism in the Nineteenth Century*, Oxford, 1981; David Arnold, *Colonizing the Body : State Medicine and Epidemic Disease in Nineteenth-Century India*, Berkeley, Los Angeles, London, 1993. Mark Harrison, op. cit., Cambridge History of Medicine, Cambridge University Press, 1994.

[3] Lt. W. G. King, *Transactions of the South Indian Branch of the British Medical Association*, Vol. IX, 1901.

[4] Lord Rippon's liberal policy particularly "deprovincialisation" helped to strengthen the local self-government. The provincial monetary powers come under control of local governments which had greater advantages particularly for health, education and public works. See Chapter-3 in S. Gopal, *British Policy in India 1858-1905*, Cambridge University Press, Cambridge, 1965, 146-147.

[5] I. J. Catanach, 'Plague and the Tensions of Empire: India 1896-1918', In David Arnold ed., *Imperial Medicine and Indigenous Societies*, Oxford University Press, Delhi, 1989, 54.

[6] From 1858, the colonial state had a special focus on the improvement of sanitary conditions in barracks, military camps and increased medical facilities.

[7] David Arnold, *Colonizing Body, State Medicine and Epidemic Disease in Nineteenth Century India*, University of California Press, Berkeley, 1993.

[8] W. G. King, 'Paternal Verses Common-sense Plague Policy', *Transactions of the South Indian Branch of the British Medical Association*, Vol. IX, 1901, 24.

[9] No. 111 (Home, Medical-A), June 1910 (NAI).

[10] Ibid.

[11] Ibid.

[12] *Proceedings of All India Sanitary Conference*, Madras, 1912, Vol. I, 8.

[13] Ibid.

[14] G.O. 713 (Public), Dated 11th Aug. 1910 (TNA).

[15] G.O. 1224 (Public) Dated 1st Oct. 1913 (TNA).

[16] Ibid.

[17] Ibid.

[18] Arthur Lankester, *Tuberculosis in India*, Calcutta, butterword & co. (India), 1920, 240.

[19] Ibid.

[20] Ibid.

[21] Ibid.

[22] C. Frimodt-Moller, 'Application of Our Knowledge of Tuberculosis to Indian Conditions', *IMG*, June 1927, 337.

[23] Ibid.

[24] A. C. Ukil, 'Prevention of Tuberculosis in India', in *Far Eastern Association of Tropical Medicine,Transactions of the Seventh Congress*, British India, December 1927 (ed.), Lt. Col. J. Cunningham, Vol. II, 414.

[25] Ibid, 432.

[26] Ibid, 433.

[27] 'The Tuberculosis Problem' (editorial), *Indian Medical Gazette (IMG)*, LVIII, Sept 1923, 432.

[28] Smallpox, plague, cholera, relapsing fever, enteric, diphtheria and tuberculosis were notifiable diseases in Bombay. See *Annual Report of the Health Department*, Corporation of Madras, 1915, p.20 and Lankester, op. cit., 1920, 241.

[29] It had been assumed that it would help to obtain reliable statistics of mortality of tuberculosis would help to reduce the mortality. *Report of the Health Department*, Corporation of Madras, 1915, 42.

[30] Lankester, op. cit., 1920, 115.

[31] Ibid.

[32] Ibid, 1920, 242.

[33] Ibid., 242-43.
[34] Ibid, 243.
[35] No.1-3 Education, Health and Land (health-A) May 1927, (NAI).
[36] This Act made a special emphasize on overcrowding in urban areas. Madras Public Health Act - 1939.
[37] No. 111 (Home, Medical-A), June 1910 (NAI).
[38] No. 111 (Home, Medical-A), June 1910 (NAI).
[39] Ibid.
[40] Ibid.
[41] Preface, in Sista Gopalam, *Pradhamikasala Arogyabhodini* (Elementary School Health Guide) (in Telugu), Rama and Co., Eluru, 1915.
[42] Ibid.
[43] G. O. 2980 (Public Health), Dated November 16, 1935 (TNA).
[44] *Report of the Health Survey and Development Committee*, Vol. I, Government of India, Calcutta: Government Press, 1946, 103.
[45] G. O. 1224 (Public), Dated Ist Oct. 1913 (TNA).
[46] Ibid.
[47] K. S. Srinivas Iyer, 'Medical Inspection of Schools', *Bulletin of South Indian Medical Union*, Vol. II, No. 12, December 1930, 239.
[48] G.O. 2045 (Public Health), Dated 19th August 1929 (TNA).
[49] Iyer, op. cit, December 1930, 239.
[50] Ibid.
[51] Ibid, 240.
[52] *Annual Report of the Health Department*, Corporation of Madras - 1928, 128.
[53] Ibid., 130.
[54] G. O. 28 (Education and Public Health), Dated 3rd January 1941 (TNA).
[55] K. S. Sanjivi, 'Prevention of Tuberculosis', *The Madras Medical Journal*, Vol. XVII, No.1, January 1937, 1-17, 1-2.
[56] G.O. 811 (Education and Public Health), Dated 1st March 1938 (TNA).
[57] George V (George Frederick Ernest Albert, 1865-1936) was the monarch of British Empire during the period 1910-1936.
[58] G. O. 3838-39 (Education and Public Health), Dated 28th October 1938 (TNA).
[59] The Bhore committee (1946) recommended ameliorative measure on extensive scale because tuberculosis is a social disease. The recognized the need to take steps towards improvement of environmental hygiene-living conditions such as housing, nutrition, improvement of sanitation in the home, the work place, and public places. *Report of the Health Survey and Development Committee*, Vol. I, Government of India, Government Press, Calcutta, 1946, 103.
[60] Ibid.
[61] King, op. cit, Vol. IX, 1901, 10.
[62] Ibid, 24.
[63] Report of Health Officer, Corporation of Madras - 1922, 13.
[64] P. S. Chandrasekhar, *Consumption in Madras*, 1914, 80-81.
[65] W. J. Wanless, *Tuberculosis in India, Some Suggestions on its Spread and*

Prevention, Supplement to the *Indian Journal of Medical Research*, Vol.III, 1914, 38-41, 39.

[66] Ibid, 41.

[67] The district health scheme was introduced on 1st April 1923. According to this scheme, district health inspectors had been appointed in each district. Initially the government appointed only 205 district health inspectors appointed while 219 taluqs existed in the Presidency. The duty of health inspectors was inspection of the areas to control various infectious diseases, fairs and festivals and propaganda work. G.O. 555 (Public Health), Dated 30th March 1923 (TNA).

[68] The Central Government proposed to introduce the National Health and Baby Week in all provincial governments in July 1921 with "suitable modifications" of the programme which was followed for a week from 7th to 13th October 1923 in England. Initially the Government of India preferred to follow simultaneously with England. But many provincial governments and local bodies in the Madras Presidency felt that it was difficult to organize in effective manner within a short period. The Government of Madras and local bodies agreed to follow the week from 14th to 19th January 1924.

[69] G.O. 736 (Public Health), Dated 12th May 1924 (TNA).

[70] Ibid.

[71] G.O. 2980 LSG (Public Health), Dated 16th November 1935 (TNA).

[72] G.O. 2795 (Education and Public Health), Dated 8th August 1939 (TNA).

[73] *Report of the Health Survey and Development Committee*, Vol. I, Government of India, Calcutta: Government Press, 1946, 103.

[74] This organization was started in 1928.

[75] G.O. 850 (Public Health), Dated 21st April 1932 (TNA).

[76] G.O. 2980(Public Health), Dated 16th November 1935 (TNA).

[77] No author, Booklet "*Tuberculosis: A Deadly Enemy* (in Tamil) Village Series-1, The Christian Literature Society for India, Madras, 1932.

[78] Kadalichina Bhairavaswamy, *Aarogya Geethamulu* (Health Songs), Published by D. N. Setty and D. V. Reddy, Saraswathi Power Press, Rajamundry, 1927 and Mallela David, Rural Health Songs (*Arrogya Keerthanalu*), The Arogya Bharathi Campaign, Andhra Ghrandalaya Press, Bezawada, 1933, 29-31.

[79] *Report of Health Department*, Corporation of Madras 1916, 16.

[80] G.O. 1139 (Public Health), Dated 7th July 1923 (TNA).

[81] Rao Bahudur M. Kesava Pai, 'Nirodinchutaku Sangahsamskaranmulu Mukhyamu (Social reforms are necessary to prevent the disease)', *Arogya Prakashika*, Vol. 9, No. 2, May 1939, 9-11.

[82] Lankaster, op. cit, 1920, 3.

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Smallpox and Children in Colonial Bengal: Revisiting a Virulent Epidemic

Sujata Mukherjee and Nilanjana Basu

In British India smallpox claimed several million victims and often accounted for more deaths than all other diseases combined. Existing evidence prove that whenever smallpox broke out in epidemic form in different parts of India roughly every five to seven years, its victims were mostly children. Both the British officials and Indian reformers expressed their concern about the scourge of smallpox and its devastating impact on children. It was stated about northern India "it has become quite a saying among the agricultural and even wealthier classes never to count children as permanent members of the family until they have been attacked with and recovered from smallpox."[1] In 1879, Sir Sayyid Ahmad Khan pointed out that smallpox was 'the inevitable bridge which every child has to cross before entering into life; and recovery from the disease is considered second birth… Other diseases are looked upon as accidental; but smallpox is regarded, as indeed it is, [as] almost universal. It touches the keenest of human susceptibilities; for there are thousands in this country who, though spared by it from death, still have traces of its violence in the deep marks on the face or the loss of an eye.'[2]

This essay is an attempt to interpret evidences to analyse the impact of smallpox on children of Bengal in the context of different aspects of the disease including portrayal of the outbreak of smallpox epidemics, control measures like vaccination, and responses and reactions of different sections of society. What were the steps taken by the colonial administration to control smallpox in Bengal? What were the views of the colonial authorities regarding prevalence of the

disease? How far were the measures successful in controlling the spread of disease among children? How did the colonizers view these measures and what were their reactions? These are some of the issues addressed here.

Despite several writings and analyses of different scholars and writers on smallpox its impact on children has not been addressed adequately. Neither has its implications been studied. Existing interpretations are revisited and reanalysed to enrich our understanding of the problem and see how far these are offering tenable views and explanations.

Smallpox and vaccination

It is difficult to determine the exact number of deaths from smallpox in early nineteenth century India or Bengal owing to absence of reliable statistics. In his Annual Report on Vaccination to the Medical Board for 1838, Dr Stewart pointed out that 'taking the census of Calcutta made in 1837 to be correct and the average of six years as affording a fair estimate of the mortality, the annual mortality of the Hindus by smallpox is 0.295 per cent, or one in 399; that of Muslims is only 0.128 per cent, or one in 782. Out of 100 deaths of Hindus, five and a half are caused by smallpox; in 100 deaths among Muslims, the number caused by smallpox is six.[3] Between 1837 and 1851 out of more than a third of a million people in Calcutta death from smallpox touched the figure of 11000. The epidemic of 1849-50 claimed 6100 deaths in Calcutta alone. Between 1851 and 1869, 9549 further deaths occurred.[4] Severe epidemic of smallpox claimed 37010 in 1919 and 36190 in 1920. Mortality remained comparatively low in the following few years but again touched a high figure due to outbreak of severe epidemic in 1925. The year 1936 witnessed steep rise in smallpox death touching a figure of 46287. Following years recorded a downward trend but again smallpox epidemic broke out in severe form during and after the famine of 1943-44 in Bengal.

Vaccination was introduced by the British in Bengal soon after the discovery of Dr. Jenner. In 1798, Dr. Jenner published to the world that

he had discovered and matured a process by which persons might be protected against smallpox without danger to themselves or risk of infecting others. It was stated:

> After various endeavours, successively made to send lymph dry to India had failed, Jenner urged that more effectual means should be taken, and engaged that if 20 recruits who had not had small-pox were selected and be were allowed to appoint a surgeon to attend them, the disease should be conveyed in the most perfect state to any of our settlements. This project was not allowed to be carried out, and it was reserved for Dr. De Carro of Vienna to accomplish the first interdiction of vaccine in India. He placed a small price of charpie saturated with lymph between two small pieces of glass. One of which had a concavity on its surface, the glasses were bound together and their edges sealed and otherwise were made perfectly air-tight. In this state the packet travelled across Europe and reached Baghdad, from where it reached Bombay.[5]

It seems that supplies of vaccine lymph were sent to Madras and Ceylon and from Madras they were sent to Calcutta.[6] In 1803 when Dr. John Shoolbred succeeded Dr. William Russel as the Superintendent-General of Vaccination Civil Surgeons were appointed to work under subordinate Superintendents of Vaccination to promote vaccination.[7] In 1804 Dr. Shoolbred Published a report on Vaccination by order of Government. In that year, out of 8140 persons 1,426 had been vaccinated in Calcutta, and 776 were vaccinated in the Bengal provinces.[8] According to Dr. Shoolbred Brahmin tikadars who were engaged in the profession of inoculator were opposing the practice of vaccination. He published a statement about the power of the vaccine and pointed out that there was nothing in the remedy which could be objectionable.[9]

From 1816 onwards the Medical Board was put in charge of the general superintendence of vaccination The Superintendent General was in charge of distribution of vaccine lymph all over Bengal.[10] By 1828, 30 vaccine stations were established but later the office of the Superintendent of vaccination in all stations except six were abolished

to curtail expenses. Gradually, vaccination operations in Calcutta rose from 2,327 in 1827 to 10,988 in 1843.

Under a new scheme introduced in 1835, 56 Civil Surgeons were reappointed as Superintendents of Vaccination. In 1838, the Government established vaccine depots at Dacca and Murshidabad. A class of native vaccinators was also attached to each Charitable Dispensary. Two or three of these men were to form part of the sanctioned establishment as assistants to the Native doctor. They were to be under the orders of the civil surgeon and to be present of stated times in certain parts of the town to vaccinate all applicants in the presence of the Medical Officer. Eventually, these operations were to be extended to the neighbouring districts. This was the system of dispensary vaccination which remained in force throughout the presidency.[11]

In March 1844 the chief Magistrate of Calcutta wrote to the government of Bengal for assistance to control smallpox. Under the advice of the Medical Board, a considerable increase in the vaccine establishment took place in addition to the establishment of small pox hospitals. The new Vaccinators were ordered to attend once a day at each dispensary, and at other times to visit from house to house and prevail on the children to be vaccinated. The success attending to this movement was reported to have been very great. In 1850, a special committee was appointed by government to enquire by what means the extension of smallpox could be prevented or rendered less destructive. In 1851, the Government of India called upon the subordinated administration for their views on the question of the best means of extending vaccination. It was thereupon decided to divide the country or provinces into certain circles, presided over by a Superintendent General.[12]

Later on the town of Calcutta was divided into three divisions for vaccinating purposes, to each of which a Sub-Assistant Surgeon as Superintendent was appointed, with a set of operators under him. The system applied to the town was the same as the "Bombay system" in the country. In 1863, a vaccine establishment was set up for the

station and district of Darjeeling. In 1864, vaccinations largely increased in the town of Calcutta. In the following year, the inspector-general of hospitals recommended that three circles of vaccination should be organised on the 'Bombay System' with a medical officer as superintendent. In 1866, the necessity for establishing other circles was pressed upon the government of India. In the same year, a scheme was submitted to the government, embracing more extended arrangements for carrying on vaccination in Calcutta. Vaccinators in Calcutta increased from 20 to 60, and in the surrounding districts from 69 to 125. During 1867, these measures came into operation for Calcutta, which resulted in an increase of 31,796 operations for the year 1868-69. In October, 1868, operations commenced in three metropolitan circles, each with a sub-assistant surgeon as deputy superintendent, for the extension of vaccination in the neighbourhood and vicinity of Calcutta.[13]

Various pamphlets on vaccination and short notices on the subject were freely distributed throughout the province. The Reports of the Sanitary Commissioner for Bengal for the years 1869-70 stated that a small pamphlet was prepared by Dr. T. Edmonston Charles, Superintendent General of Vaccination, and a translation of it was circulated under the orders of government in the Bengal districts. It dealt with the danger and fatality of smallpox and its absolute contagious nature, its great power of spreading from district centres, or, even from a single infected person, the protection afforded by vaccination, the great importance of isolating infected individuals and of destroying or disinfecting contaminated clothes and the like.[14] Following the Vaccination Act of 1871 passed in Britain to introduce compulsory vaccination, Bengal Act V of 1880 was passed which prohibited inoculation and provided for compulsory vaccination in the town and port of Calcutta and in other towns and selected areas. Later it was extended to the suburbs of Calcutta and Howrah and other municipal areas by periodic notifications. By 1921 the Act was further extended to all the district board areas.

Obstacles to vaccination, children and protest

Vaccination was very unpopular in most parts of the province. Parents used to hide their children from the vaccinators in the belief that the operation would cause them pain and lead to suffering and disease. Deaths from other causes months after children were vaccinated were also sometimes attributed to vaccination.

British officers often blamed the rigid mind-set of the people of Bengal for their unacceptance of vaccination and preferring the traditional practice of inoculation. It appears from different investigations that nearly 70 per cent of the population of Bengal was inoculated by the middle of the nineteenth century[15].

Inoculators were often blamed for being responsible for outbreak of epidemics. It was reported in 1844, "Smallpox is annually introduced into Calcutta by a set of inoculators, numbering about 30, to the great endangerment of the public health".[16]

Official report on the outbreak of smallpox in the Bankura district in 1874, stated that the group of vaccinators deputed to stamp out smallpox in Bankura, could not induce many people to accept vaccination from them. Many ex-inoculators, after abandoning their former practice, adopted vaccination. There were approximately, 108 such ex-inoculators in Bankura, all working under the Civil Medical Officer. The local people naturally preferred them more than the strangers. These ex-inoculators operated on 10,460 persons in 1872-73, which increased to almost 22,000 in 1874. However, the Civil Medical Officer could not effectively supervise these 108 ex-inoculators, as he could not be absent from his civil station for more than few days. Hence, remaining unchecked, the 108 ex-inoculators continued on their own accord the work of vaccination. Reports mention that carelessness in their process of vaccination of the people all over the district could not be checked.[17]

It seems that the method of vaccination used by these ex-inoculators was wrong and could never produce satisfactory and effective results. Thus, when smallpox broke out in Bankura, children who had been vaccinated by ex-inoculators only a year or even three months before,

were attacked by smallpox and many of them even died. This resulted in a lack of confidence among the people of Bankura regarding the protective power of vaccination. They now refused to take it.[18]

Dr. K. P. Gupta, the Superintendent of Vaccination mentioned about places in Bankura getting affected by smallpox as a result of poor vaccination.[19]

Below is the table showing statistical number of cases of smallpox occurring after vaccination in villages, in and around Bankura, during 1874.

No.	Name of Villages	smallpox after Vaccination	Recovery	Deaths	When vaccinated
1.	Bankura	22	19	03	1873-74
2.	Gopeenathpore	35	27	04	1871
3.	Sreerampore	07	07	X	1873
4.	Katnaree	44	32	05	1873
5.	Junebadea	31	12	05	1873
6.	Koolbadea	09	09	X	1873
7.	Rajagram	14	08	06	1873
8.	Nokepore	09	09	X	1873
	Total	171	123	23	

Source : Municipal Department Sanitation: Resolution : Calcutta : 3rd June 1874; smallpox in Bankura; [File 164-46/47] pp. 2-28.

Some of the other difficulties experienced by certain District Health Officers in undertaking the preventive measures against smallpox were as follows –

In Bankura, free vaccination was not introduced by the District Board. The District Health Officer of Rangpur stated that people often delay vaccination after exposure to infection. They took it for granted that vaccination was useless. Besides these, many persons including doctors used to blame the vaccinator or the lymph used for vaccination for the failure of vaccination to prevent the disease. Unavailability of

female vaccinators was also taken up to be a major cause for the failure of the vaccination programmes, because many Muslims and conservative Hindus did not allow their women to get vaccinated by unknown male vaccinators. The District Officer of Pabna reported that opposition to re-vaccination, especially those of women and the absence of female vaccinators, need for segregation of the infected person, throwing of the infected dead bodies into rivers and also want of an adequate number of vaccinators were among the difficulties faced by him.[20]

The feeling against vaccination was very strongly exhibited in thana Sootahata in Midnapore where the people petitioned to have their children inoculated on the ground that the numbers of the people who had received vaccination had died of smallpox. The police shared the mistrust of the people and were not only indifferent but in some cases they even offered passive resistance by refusing to let their children be vaccinated and by advising the people not to accept vaccination.[21]

The government attempted to vaccinate the children in Bengal through various measures.[22] The following table exhibits the statistics of the percentage of children vaccinated in Bengal during the period from 1871 to 1873.

Province	Percentage of vaccinated children			
	Under 1 year		Over 1 year	
	1871-72	1872-73	1871-72	1872-73
Bengal	13%	10%	87%	90%

Source : Reports of the Sanitary Commissioner for Bengal, for the year 1869-79, 41-56.

The table shows that the percentage of those under 1 year in the province of Bengal was miserably small – only 10. This could be perhaps due to the falling off in the dispensary vaccination during the period. The Act of 1880 made it legally binding on the local authorities to provide for vaccination. It was the duty of the Superintendent of Vaccination to ascertain that the children of the

area under his superintendence received vaccination. All persons who came to the public vaccine stations would receive vaccination free of cost. But Public vaccinators who went elsewhere to vaccinate the children at the request of the parents would receive a fee.

The Bengal Municipal Proceedings Miscellaneous, Vaccination, Sanitation, Ferries 1881 stated that of out of the total number of children successfully vaccinated during the year 1881 majority were between one and six years of age and the second largest group of children belonged to the age group of above six years. The number of infants vaccinated during the first year of life was quite small. It appeared that only 12.59 of the infants born during the year were vaccinated. However it was claimed that on the whole vaccination was becoming more favourable in the society.[23]

The Abstracts of Inspection Reports on towns visited to inspect the number of children vaccinated in 1882 can be observed through the following table:

Year 1882

Division	Under 1 year	1 Yr. and under 6 Yrs.	Above 6 Yrs	Total at all ages
Calcutta Town	2504	5665	874	9,043
Burdwan	2292	17620	5942	25,854
Bankura	2113	13459	4555	20,127
Birbhum	677	6443	3037	10,157
Midnapore	7268	35173	13893	56,334
Hughli	2420	15162	3672	21,254
Howrah	2353	12488	2083	16,924
24 Pgs.	4495	29106	6591	40,192
Murshidabad	2233	36958	8334	47,525
Total	26,355	172,074	48,981	247,410

Source: Proceedings of the Lt.-Governor of Bengal : Medical Dept. Dispensaries in Presidency Division : 1880-1885; [File 89-124].

It is evident from this table that 26,355 children below one year of age were inspected if they had vaccination.

From the Proceedings for the year 1880, Bengal Municipal Proceedings Miscellaneous, Vaccination, Sanitation and Ferries, it can be noticed that vaccination against smallpox and the respective vaccinators were taken quite sceptically by the indigenous population. Endless oppositions were faced everyday by the vaccinators during their operations. According to the Government Proceedings during the year 1880, even on the appearance of the vaccinators, or, the superintendent of vaccination, all children of a specific 'Mohullah' where vaccinators visited, were quietly removed, or, were shut up in houses with the doors closed to prevent them from being seen by the vaccinators.[24]

Nevertheless, the vaccinators carried on with their work, and as soon as a child was obtained, it was conducted to its parents, and after more or less argument, consent was generally obtained for its vaccination. But one essential part of the proceedings was to locate and bring out the child from its home. As soon therefore as all the children in any Mohullah were protected, those who were hidden were also brought forth by various means.

The various means by which the local population were intimated regarding vaccination were quite interesting. In one case, a 'Tomasha Wallah' was directed to sound his drum and the children on emerging from previous obscurity to enjoy the performance were conducted to their parents, whose consent it was necessary to obtain before they could be vaccinated. In another instance, a snake charmer was paid to sound his pipes and a similar end was attained.[25]

In the Burra Bazar area, some of the people, made a mockery of the using of the snake charmer in matters of vaccination. They whispered into the ears of the snake charmers that these vaccinators were dangerous fellows to have too close an intercourse with, and as certainly as they got any person to talk with them they were sure to persuade him in favour of vaccination, and that it was likely that they might attempt to persuade the snake charmer so that snakes would not be able to dance while vaccination was in progress. This was quite hilarious on the part of the Indians, which reveal strong sense of disgust and disliking against vaccination.[26]

However, the vaccinators continued with their work. The records of the Fort William, Medical Department stated that in order to facilitate

vaccination to those who desired, new vaccinating stations were opened all over Calcutta, and notices both in English and Bengali, extensively circulated, informing the public that there were 13 stations in Calcutta at any of which they might have themselves protected from smallpox.[27]

Every possible technique was tried to effect the purpose of vaccinating children by persuading the mothers to allow their children to get vaccinated. In one such case, an infant was taken from its mother and was secured in getting the half-willing father to hold the child, while the vaccinator did his work. In this case though the woman made the most determined opposition while, the one arm was being operated on, she consented to hold the child herself for the other arm to be vaccinated. In another case, where the mother would not consent, when twice previously asked, the child was quietly vaccinated when the father was only at home. The father himself consented to the operation and approved of its being continued, but he continued to inform the vaccinators about what consequence he had to face on his wife's return and knowledge of getting their child vaccinated. Yet in another case, a child in a small place about 12 feet square, in which two other people were lying with a bad type of small-pox, was vaccinated against the wish of the father, who begged to have the operation deferred for two weeks, until the cares of his sick household should become a little less heavy on him. The poor man little knew that without the operation of vaccination he would also in all probability lose his one child.[28]

It has been pointed out that in Bengal vaccination lagged far behind most other provinces. Moreover, "By 1900, when the figure of 2 million primary vaccinations a year had been reached, more than 20 per cent of the targeted age group, those under a year old, were still being missed".[29]

According to Roger Jeffery vaccination demonstrated the failure of British health policy to come to terms with local society.[30] Official reports often mentioned factors like socio-religious customs as causing obstructions to spread of vaccination. It is a well-known fact that from very early times, in different parts of India including Bengal smallpox was identified with Goddess *Sitala*. The disease was often perceived as a manifestation of the presence of the Goddess. To many devotees, treatment was supposed to provoke the Goddess and when an attack

of smallpox occurred cooling drinks and substances were offered to the patients. A very interesting case in the then Bengal had been reported, which focussed on a woman possesed. It was stated: "..... a woman apparently possessed by the Goddess *Sitala* in Bengal… she … amid incoherent ravings denounced the vaccinators and prophesised that everyone they operated on would die ..."[31]

Among the Muslims the Faraizis, the followers of Haji Shariatulla who went to Mecca and Medina, and came under the influence of Abdul Wahab first started to propagate Wahabism in a village in Faridpur district. He won many followers in his bid to reform Islam. He preached among other things that inoculation and vaccination should be forbidden. Following Hindu customs many Muslims worshipped goddess Sitala which needed to change. It was considered to be a sin for the Muslims to have pus or blood from man or animals injected into their bodies. Thus, vaccination in any form was forbidden.[32]

As cow had been considered to be sacred by the Hindus, the effects of injecting something bovine into the human body, sparked hostility in the society. In Nineteenth Century Bengal, some mediums attributed the wrath of the Goddesses, to the activities of the vaccinators. To overcome this, experiments with other animals were tried, for example, the buffalo. However, the most frequent resolution was to continue arm-to-arm vaccination, unpopular in itself because of the connotation of extracting lymph from previously vaccinated children. Many parents even forbade the early vaccination practice of using children as arm-to-arm vaccinators. They feared that their child could become more ill, and, in some cases children died from prolonged exposure and fatigue from being taken to other villages as vaccinators. In addition, the caste system strictly forbade the mixing of the blood between lower and higher castes, and children used as vaccinators were often of a lower caste.[33]

Rumour and stories among the indigenous population regarding vaccination and vaccinators, presented the vaccination process as suspicious. Vaccination was thought as the instrument of a villainous empire attempting to place tracers on individual. Resistance also arose from fears that the colonizers were deliberately infecting locals with disease. The people of Eastern Bengal considered it to be inconsistent that vaccination, without causing eruption, could protect from small

pox. They also could not conceive why Government was spending so much money in vaccination schemes, without the prospect of substantial return. Hence, they started believing that the government would levy more taxes on them in order to compensate for its financial loss incurred due to vaccination.

During the tours of inspection the Civil Surgeon observed many times that many "children and even adults, presented themselves with bleeding arms, apprehensive that the crusts would be taken by the Surgeon. They even tore the crusts off and threw them away".[34] It must however be remembered that the cause of vaccination was promoted sometimes by the Indians themselves. Babu Hem Chandra Ghosh of Bagnan in Howrah, Mr. Pope indigo planter of Murichi in Murshidabad and the Rajahs of Maliarah in Bankura and of Moyna were prominent among them. Both the Rajas introduced vaccination amongst their tenants although interestingly, the former excluded it from its own household.[35]

The Government Proceedings further revealed that, every time when the vaccinators felt frustrated and got sanguine about their failure, to their happiness, they used to get a man (who previously had violently refused vaccination), who would come himself along with his family members to be vaccinated. This created a sense of 'moral influence' which in turn influenced his neighbours to get vaccinated. It was also seen, when, the vaccinators went to a certain place for operating vaccination, and typically faced opposition, some sudden intelligent passerby would join in the loud and angry controversy and speak to the people, with whom the vaccinators were contending. The exact words spoken by one such passerby, in one such operation were the following: "It is no use your talking any more, everybody has been vaccinated, and you also will simply have to be vaccinated. After the sahib has come down among you it is unfair to keep him standing in the sun".[36]

Such simple remarks worked wonders and put the vaccination operation to begin.

Concluding remarks

As pointed out correctly, "Popular responses to epidemic smallpox in nineteenth century Bengal offer a mixed and complex pattern, and

these complexities stemmed from their varied and differential perceptions of the epidemic."[37] It can be argued that the opposition to vaccination gradually lessened in course of time particularly in urban areas like Calcutta and a section of Indians showed support for the cause of vaccination. However among certain sections of urban, semi-urban and rural population acceptance to vaccination was not forthcoming for a prolonged period of time.

Apathy of the people towards vaccination is seen by the fact that in 1930, out of 118 municipalities, not a single infant was vaccinated in 9. Moreover, in 1929 5 out of these 9 had a blank record.[38] Between 1931 and 1941 on an average 2.8 million received primary vaccination. The average number of children under one year available for vaccination was around 1.28 million.[39] It was pointed out in a report that parents were reluctant to having their children vaccinated until they were several years old. The Director of Public Health noted that except during outbreak of epidemics people were generally reluctant to receive vaccination. They reportedly tried many means to avoid primary vaccination.[40] There were also sometimes conflicts within the government circles regarding how and when to perform vaccination. Some researches argue that the development of smallpox control policies between 1890 and 1940 often mirrored the fractured nature of colonial India's administrative structures.[41] Conflict of opinions within government departments meant that even when funds were available, vaccination could not make much progress.The status of the vaccinators often acted as impediments against smooth extension of vaccination. The vaccinators were not government servants and depended for their living on the fees, which they got from the people. But unfortunately they could not realize those fees in many cases, as there was no special law in force compelling the payment of those fees.[42] As pointed out by scholars, cultural resistance was only one of the inhibiting factors and many other factors contributed to the slow progress of vaccination. Technical difficulties remained one major hindrance for vaccination to succeed. Cowpox was rare in India and until the 1890s vaccine had to be imported from Britain and the lymph in many cases lost its effectiveness. Efforts were made to maintain supply through arm-to-arm vaccination. Officials reported that many families did hide their children from the vaccinators

because they were reluctant to pay for vaccination and moreover they did not want to accept the use of their children as vaccinifers and wanted to avoid certain things which created discomforts like carrying their children to the neighbouring villages and so on.[43]

It is evident from the above account that with the introduction and spread of vaccination the bodies of children became a contested terrain between the colonizers and the colonized. The parents were often reluctant to let go off their control over the bodies of their children because they feared they would die. The state on the otherhand, wanted to claim ownership over the bodies of the children for performing a supposed act of bodily welfare. As shown above, both sides adopted different measures for claiming the bodies of children. It was a continuous battle in which sometimes one side and sometimes the other side won. The worst sufferers were however the children who lost lives and had to face unmitigated sufferings.

Notes

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[16] S. P. James, op. cit., Calcutta, 1909, 11.
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[24] *Bengal Municipal Proceedings, Miscellaneous, Vaccination, Sanitation and Ferries, 1880-1890.*

[25] Ibid.

[26] *Triennial Report of the Sanitary Commissioner for Bengal on the working of the Vaccination Department in Bengal, during 1887-1890.*

[27] Ibid.

[28] Ibid.

[29] *Bengal Vaccination Report, 1896-1902*, 2.

[30] Roger Jeffery, *The Politics of Health in India*, Berkley, University of California Press, 1988, 100.

[31] *Bengal Municipal Proceedings: Miscellaneous, Vaccination, Sanitation, Ferries 1880-1890, Proc. Nos. 209-210,* 80-85.

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[33] *Bengal Municipal Proceedings: Miscellaneous, Vaccination, Sanitation, Ferries 1880-1890, Proc. Nos 209-210, 80-85*

[34] Ibid.

[35] Ibid

[36] Ibid

[37] Arabinda Samanta, op. cit., 2012, 235.

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[39] *Bengal Public Health Report, 1940, 129-30.*

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Science and Philanthropy in a Colonial State: Reviewing the Intervention of Rockefeller Foundation in Bengal

Arabinda Samanta

I

Scholars working on the role and nature of western medical intervention in colonial India broadly agree that the colonial health policy was essentially curative, which neglected preventive medicine, and that it aimed at extending political, economic and cultural hegemony over the colonized subjects. Radhika Ramasubban, for example, argues that the priorities of the colonial government in India produced a 'distinctly colonial mode of public health'.[1] Other scholars generally agree with her but would like to attribute the limitations to the failure of the indigenous people to respond positively to British attempts rather than the British rulers' delightful unconcern.[2] David Arnold and Mark Harrison have argued that the local social and cultural imperatives dictated that the British adopt a 'gradualist' approach in their attempts to contain epidemic diseases.[3] Consequently, it has been argued that public health policy in India was a 'qualified failure', for while the Europeans enjoyed benefits of civic concern, the Indians gained very little since preventive campaigns were neither given a fair trial nor fully pushed through.[4] This notion of differing benefits to the colonizers and the colonized has also been put forward by V. R. Muraleedharan while he argues that the tardy progress of public health policy was not so much due to financial constraints as such, but more owing to the local bodies' reluctance to accept certain potentially useful interventions.[5] In view of these differential perceptions of historians regarding the nature and consequence of

colonial medical interventions in India, it is pertinent to look into the role of some foreign agencies vis-a-vis the colonial one. Did the independent, non-governmental welfare agencies behave the way the colonial government did? The present paper seeks to review the work of a welfare agency in the late nineteenth and early twentieth century Bengal, the Rockefeller Foundation, which worked in tandem with the British colonial administration.

The International Health Board (IHB) of Rockefeller Foundation (RF), U.S.A made an enduring effort to mitigate malaria in Madras, Mysore and elsewhere in India in a very systematic and scientific way. Especially, the nature of Rockefeller intervention in Madras is well documented.[6] It was also appreciative of the efforts made by the government of Bengal to mitigate malaria in the province during the late colonial period. It was very much enthusiastic about the health programme initiated by non-government indigenous organizations as well. But unfortunately so far as colonial Bengal is concerned, extant literature on the subject is reticent. This paper is a humble attempt in that direction.

II

Colonial Bengal was arguably the largest tract of the country overrun by multiple ailments in epidemic forms, especially malaria. Every year no less than eighty thousand of people used to die of this disease. The 1921 Census showed an actual diminution of population to the extent of nearly 1 million. The Government of Bengal was trying to grapple with the problem with its limited resources, but on account of the extensive tract over which malaria was proliferating and the number of people affected, it had not succeeded in making much impression on the problem. In fact, the role of the government in this regard was more in the nature of palliation rather than prevention.[7]

Realizing the attitude of the government, a number of public-spirited people in Bengal started anti-malarial societies to raise money to which a contribution by the government had been added. With the

help of this fund, they were organizing branch societies in malaria stricken villages. Particularly the members of the Central Cooperative Anti-Malarial Society had been largely successful in attaining their aim in two villages, which they took up in 1921. They had been overwhelmed with applications from hundreds of neighbouring villages to do similar works in their respective hamlets, but were prevented from taking up the work due to financial constraints.

The Society, therefore, approached the RF with a request to help them in this unequal fight which they had taken up for saving forty-seven million people from the clutches of malaria. Dr Gopal Chandra Chatterjee, the Secretary of the Society appealed to Dr C. A. Bentley, Director of Public Health for Bengal to forward a letter of appeal to the RF.[8] Sometime in November 1922, Dr Bentley forwarded the application for monetary help from the Secretary to the Central Cooperative Anti-Malarial Society. The Society, Dr Bentley believed, was worthy of every possible assistance, for he had personal knowledge of a number of the affiliated societies and was convinced that the movement was organized along the right lines. Bentley strongly supported the application for monetary help. Quite apart from anything else the educational effect of the work was extremely valuable, he believed.[9] The IHB, however, empathized with the concern of the Society and appreciated the work it had undertaken, but, the RF pleaded, it could not help it with man or money because its primary interest lay in scientific research on malaria rather than helping people in distress with financial support.

Nevertheless, the warmth of relation between Dr Bentley and the IHB did not die down because of the latter's non-compliance. The Foundation received with thanks the copies of *Malaria and Agriculture in Bengal*, a celebrated book written by Dr C. A. Bentley, and found it very 'interesting and instructive'. The IHB in fact distributed the copies to staff members who were most interested in malaria control elsewhere in the world.[10] The Rockefeller Foundation's International Health Board had also prepared a cinematographic film for illustrating the natural history of malaria and the preventive methods against

that disease. This film had been demonstrated in London at a meeting of the Royal Society of Tropical Medicine and Hygiene, and also of the Research Defence Society by Dr Andrew Balfour, C.B., C.M.G, Director of the London School of Tropical Medicine and Hygiene. As the subject of malaria and its prevention was crucial to the Presidency of Bengal, Dr Bentley requested the Rockefeller Foundation to present the Bengal Public Health Department a gift copy of the film, which he hoped would be exhibited all over the province by the departmental publicity bureau.[11]

Dr Victor G. Heiser, Director, IHB, RF responded by stating that a three-reel malaria film had indeed been prepared by the members of RF staff and others after 'considerable labor and expenses'. It was, he added, of course possible to make as many prints from the negative as might be desired. The RF was willing to let the Bengal Health Department have a copy of the film for one hundred dollars, which included the expenses for shipping container and the cost of printing the three positive reels. The original expense of preparing the negative, Dr Heiser added, 'we are glad to bear ourselves and to make that contribution to public health'.[12]

The RF also evinced active interest in the malaria eradication programme in Bengal. Much of the programme of the colonial government in Bengal focused on creating awareness among the people concerning the causes of the disease. The government tried with introduction of pamphlets and magic lanterns. Dr J. F. Kendrick in Madras frequently received enquiries about moving pictures pertaining to public health subjects. The Director of Public Health and the Secretary of the Health Propaganda Board asked Dr Kendrick to write the RF authority to see if they would be kind enough to seek information about the availability of films that might be used in India, including the prices of the same.[13] The RF, however, as we have seen, had prepared some films on malaria. Dr J F Kendrick wrote to Rollin C. Dean, the RF Director sometime in October 1925 and asked to send him the Malaria film. Three reels of motion picture *Malaria* was sent to Bengal.[14] In addition to this, a motion picture machine and some

spare parts were also sent to the Calcutta School of Tropical Medicine and Hygiene.

During the World War Two RF's programme of health and hygiene in Bengal was severely compromised for reasons obvious. RF's India Report for the year 1942 by Dr M. G. Belfour lamented that much of the important activities which he had in mind for proper development of the department had not materialized. Malaria was the most prolific disease in India, and malaria investigation had not progressed for the last two years; in fact, it had retrogressed. There was no longer even an Assistant Professor of Malariology. The Assistant Processor, Public Health Administration, also taught malariology. Such an arrangement was extremely unsatisfactory from the point of view of instruction in malaria control.[15] By 1944, however, the most encouraging feature about the Far East had been the general improvement in the War situation, which applied to India as well. However, colonial India was itself still an unhappy frustrated country and the political deadlock showed no signs of a solution. In spite of the 'energy and toleration' of the new Viceroy, the IHB observed, there was still obstinacy and working to cross-purposes on both the Indian and British sides.[16]

The most crucial intervention by RF in public health in Bengal relates to the foundation of a health unit at Singur in Hooghly district, some 25 miles from Calcutta, which began sometime on 1st April 1938. The place was well connected by rail and road. It was accessible for use as a training centre by the All India Institute of Hygiene and Public Health. The area had 40,000 people. A standard personnel and budget had been arranged for. The people were cooperative and one wealthy person had promised to build up a centre and quarters for the staff and a maternity home. Singur was however not the area which was first proposed but all thing considered it was a better one. The unit was proposed to come largely under the control of the All-India Institute of Hygiene and Public Health, and numerous field studies were undertaken by the department of the Institute.

However, the history of this unit had been one of a series of Government delays and the date of beginning cooperation was later

put off to 1st October 1930. Since this action was taken, Government had pressed for further delay and early in 1939 an official request was forwarded to again defer the date to January 1, 1939.[17] Mrs. S. N.Mallick of Calcutta, the widow of an influential Government official who was born in Singur donated Rs 80,000 for the construction and maintenance of an office and health centre building in Singur, and this structure was practically completed early in January 1939, when the Governor of Bengal was expected to open it. The illness of both Lord and Lady Brabourne on January 24, 1939 forced the postponement of this function. The building was expected to make a suitable and convenient centre and in this respect the Singur Unit was hoped to start much better equipped than was usual in India. Dr J. K. Bhattacharya was appointed Medical Officer of Health for the Unit on 26 November 1938. Since he had considerable experience in rural areas, in malaria study and control, and in research, IHB officials expected that he would make a good officer.[18]

By 1941 IHB officials helped prepare a memorandum in regard to the next three years of work at Singur and proceeded on that basis. The IHB officials emphasized that Singur was still a cooperative project between Bengal and the International Health Division and the training of the Institute students was a concession which the International Health Division and Bengal gladly made, even though it had interrupted the smooth working of the health unit. The Institute of Public Health and Hygiene made no financial contribution to the Unit.[19] Some of the IHB doctors visited Singur and talked with people and local administrative officers. They found the people interested but they also learned that the people had no real idea of the nature of work that was being done. On enquiry, one villager referred to the Health Unit office as a hospital; another thought it was a college because the Institute sent men there for training. Both answers seemed to indicate that the Medical Officer of Health and his staff had not done sufficient explanatory work.[20]

Leprosy was also addressed by RF, which presumably helped reduce the increase of the disease in British India through the application of the recent advances of medical science in the treatment and control of

the ancient scourge.[21] Its activities however were limited almost exclusively to through cooperation, government and schools of public health, medicine and nursing etc, and not through private or relief organizations.[22]

The RF was also interested in the uplift of rural health services in Bengal. It took keen interest in the outcome of Dr. J. F. Kendrick's visit to Rabindranath Tagore's Santiniketan. The experience of Tagore's work, the RF officials believed, might help them in their work at Madras and in other parts of India[23]. From Calcutta, Dr. Kendrick visited Bolpur, the place of Tagore's experiments with rural health services, and sent a report of what he believed of 'most importance'. Bengal, he believed, seemed to be 'alive now to the possibilities of preventive medicine'. Dr Kendrick believed that the Bengalis 'were more alive and aggressive', and Bengal was a 'hot bed of politics' as evidenced by the Non-Cooperation Movement; but despite that they were going to make steady progress in the matter of rural health programme.[24]

The School of Tropical Medicine at Calcutta, the institute for research in Tropical diseases,was then under the Government of Bengal. There was an active but slowly progressing movement to combine the School and the Institute under the Government of Bengal. Dr J. W. D. Megaw, the Director, Calcutta School of Tropical Medicine and Hygiene wrote to the Surgeon-General with the Government of Bengal (GOB) on 15 November 1922 that the Government of Bengal should approach the Rockefeller Foundation with a request for help in connection with the further development of the Calcutta School of Tropical Medicine and Hygiene.[25]

By 1943 the IHB lent a staff member to the Government of India (GOI) to serve as Director of the All India Institute of Hygiene and Public Health**.** All India Institute of Hygiene and Public Health in Calcutta was built and opened up by the Rockefeller Foundation in 1932. By 1943 two improvements had been effected. The curriculum had been revised. The teaching in Microbiology, Physiological Hygiene and Chemistry had been brought in line with modern practice.[26] The

course for the Diploma in Public Health (DPH) students in Sanitation and Public Health Engineering Department of the All India Institute of Hygiene and Public Health was the most satisfactory one around the year 1942, although, it was argued by the IHB officials, there was still 'great room for improvement'.[27] The course given by the Department consisted of 53 hours lecture and 140 hours field work, which the IHB officials believed could be extended still more.

Shortly after the U.S entered into the World War Two, the Department of Biochemistry was busy sending equipments such as sprayers and Pyrocide-20 to the U.S Public Health Service operating on the Burma Road. The War and particularly the Far-Eastern conflict had continued to be a determining factor in the International Health Division's activities and staff assignments in this part of the world. The loss of Burma resulted in the termination of the work of the U.S Medical Commission and also the transfer of the Malaria Studies Laboratory from Chefang on the Burma highway to the neighbourhood of Chungking. The threat to India, particularly Bengal and Calcutta, had its effects in the work and atmosphere of the All India Institute of Hygiene. Political disturbances in India during August-September 1942 were also a foreboding part at that time.[28]

The principal step forwarded at this time was the mutual acceptance of a collaborative scheme between the Central Government and Bengal to provide the Institute with its own administration of a rural community field in Singur. It was expected at that time, i.e. June 30, 1943, that 'the Institute will take over the administration within the next few weeks'. The initial area was to constitute the first step towards administration of a subdivision of approximately 400,000 inhabitants. The degree of government bureaucracy in India was unique. It was not until 25 November that the Bengal Cabinet took final action when an order was issued inaugurating the Singur Project from January 3, 1944.[29] The five-year programme was divided into two and three year periods. The short-term objective was in turn divided into two parts:

1. The preliminary elimination of arrears of vaccination and the establishment of facilities required for the training of self-help and other workers, requiring three to six months.

2. The development of actual techniques of administration. The long-term programme provided for the extension of administrative techniques to the remainder of the Serampore subdivision.

The financial collaboration of the IHB had proved invaluable.[30] The Bengal Sanitary Board of the Government of Bengal originally established to deal with the conservancy and environmental problems evolved into a Provincial Board of Health and set up active committees on nutrition, maternity and child welfare, and the manufacture of biological and school health.

Still another area of health that the RF took interest in was hookworm (*Anchylostomiasis*) in Bengal. Sometime in 1916, Major Clayton Lane in Bengal conducted an enquiry into Anchylostomiasis. He had had numerous difficulties to contend with, but things appeared to have improved gradually. Lane wrote that he had overcome all his difficulties with regard to treatment and that he had examined over seven thousand people.[31] In July 1918, Bentley wrote to Wickliffe Rose, Director, IHB, RF, that hookworm was exceedingly prevalent in all parts of Bengal, the ratio of infection ranging from about 50% in the vicinity of Calcutta to as high as 90% in certain rural areas. Bentley believed that over thirty million among forty-five million people of Bengal harbored this parasite.[32] Dr Bentley was too anxious to get a serious campaign started throughout Bengal, especially in connection with the schools, of which there were about forty-five thousand. For this purpose, he said he required materials of exhibit, lecture charts, school charts, leaflets etc. Dr Bentley requested the IHB to give him assistance in arranging a campaign in Bengal.[33]

As with malaria, the RF had produced still another film dealing with public health measures against hookworm disease. The film *Unhooking the Hookworm* had always been sold per positive print at the exact cost of print to the RF. These prices did not include any of the production costs. This film, as also the one dealing with malaria, was never distributed through commercial channels but always sold directly to the individuals, institutions, or government department requesting these films.[34] The IHB's objectives in this regard was to

interest the Government of India in hookworm treatment for Indian immigrants since these labourers were spreading hookworm infection throughout the world.[35]

In fact, the Foundation had produced several films each dealing public health subjects. These films were developed as an aid in control measures against various diseases. Some of these films were produced with different languages to suit different audiences. The film, *How to Live Long and Well* was shown in Travancore with Malayalam and Tamil sub-titles.[36]

The malaria problem in the Damodar Valley was commented upon by the IHB, RF in the 1950s.[37] Dr R. B. Watson reported to Dr G. K. Strode, RF, IHB that the situation in the Damodar Valley was pretty bad and would get worse as time passed. All local studies and morbidity data suggested that malaria was present in almost all population groups in the Valley. In many of those groups especially in the Lower Valley in West Bengal the disease was hyper endemic. Malaria was prevalent amongst the people indigenous to the Konar Reservoir area, a somewhat lower prevalence in the people of Tilaiya Reservoir area in the upper valley. *Anopheles* mosquitoes were commonly found throughout the delta of Bengal. The climate of the Valley was such that development of malaria parasites in mosquitoes might be possible almost year round, but water for *anopheline* propagation was not generally available throughout the year, and maximum seasonal prevalence was therefore associated with rainfall. Malaria due to culicifacies transmission was then largely associated with flooding of rice fields while *fluviatilis* malaria was associated with water in channels for irrigating or draining paddies, or with natural streams after they had been in spate. Valley-wide data on malaria prevalence would probably show, therefore, as Dr Watson observed, rising prevalence of malaria throughout the time of rainy season, which was from early summer into the autumn months, and with some evidence of transmission throughout the year.

Watson noted that malaria control operations undertaken by the Damodar Valley Corporation (DVC) were then confined only to the

employees at the various dam sites. Both the organization for this work and the programme in operation were inadequate. Watson recommended, as a first step in this creation of an organization of a malaria control programme in the Valley was to define the objectives of the programme. The short-term objective should be, he argued, the prevention of an increase of malaria in the valley as a result of the operation of the DVC. An organization could be established upon this basis, but it should contain the basic elements of personnel and equipment, which could be used satisfactorily as a basis for an expanded programme to accomplish more comprehensive, long-term objectives. The DVC should adopt as a long-term objective the eradication of malaria as a disease of public health importance from the Damodar valley.

Malaria was a complex disease, Watson observed, probably no other disease, he believed, was associated in some way with such a large number of professional disciplines, ranging from medicine to geology. He, therefore, thought that the DVC should provide immediately for the formation of an advisory body composed of competent representatives of various agencies and disciplines.[38]

Another area in which significant RF intervention occurred was its advisory role in the village health programme initiated at Santiniketan, Bolpur by Rabindranath Tagore, the Nobel Laureate, and his Western associates, Leonard Elmhirst and Harry G Timbres. Timbres wrote to Dr John C Ferrell of Rockefeller Foundation on May 5, 1932, and noted that he was trying to put into effect some of the ideas he had seen in Yugoslavia, particularly the Cooperative ideas. It seemed to him, he wrote, that not much health work of a lasting nature could be accomplished in the village regions of India until the cooperation of the people was obtained. They could be educated to the point, he believed, where they would take an active interest both in regard to participation in the work and monetary contribution to its support.[39]

Timbres discussed this scheme with Colonel A. D. Stewart, Chief of the School of Hygiene and Public Health in Calcutta, with Dr Ernest Muir, Leprosy Research Worker in the School of Tropical

Medicine, Calcutta, and with Major Gordon Covell, Malaria Survey of India. They all had agreed with its general principles and details. Timbres had started a malaria survey in Santiniketan region, a region of hyper-endemicity, with a spleen rate of between fifty and ninety-five percent. Dr John A Ferrell responded to his overtures with keen interest and sympathy. He congratulated him on the work Dr Timbres was doing. Dr Heiser who supervised the R. F's work in the East had also expressed great interest in Timbres' letter.[40]

Another of Tagore's associates working on the poet's rural health improvement programme was Leonard Elmhirst, who had an important connection with the Rockefeller Foundation. Dr Elmhirst was an Englishman, a graduate of Cambridge, England, and had taken the agricultural course at Cornell University as a preliminary to his work he had intended to engage in. Since his arrival at Santiniketan, he had started a Department of Agriculture, which although extremely tentative in its beginning was later doing good work. Elmhirst corresponded with Dr Heiser of the RF and met him. He asked Heiser to help him promote his cause in his personal capacity as a member on an Advisory Board. Dr Heiser had personally expressed his keenness about the cause but regretted that he could not join it as the RF believed it 'undesirable'.[41]

Even private participation on the part of its staff members was often interpreted as representing the Foundation. Nevertheless, he was ready to confer with any of his representatives in the U.S and assist in a non-public way as much as he could. In fact, Dr Elmhirst was told that the IHB intervenes only upon government invitation and in close connection with governmental agencies, which it believes to be ultimately responsible for the health of nations.

III

The official correspondences between the Government of Bengal and the International Health Board of Rockefeller Foundation exhibit some interesting phenomena, which might perhaps provide an insight into the nature of a colonial administration dealing with public health

and medical research. It highlights the lackadaisical attitude of the British Government in Bengal in matters of public health administration. Though the IHB was keen in relieving the people of some of their afflictions, which were tormenting them so long, the colonial government was not adequately responsive. Money perhaps was not always the deterrent, but the indifference of the colonial government was always the crucial factor that made all the difference.

But the question is why was the British government not adequately responsive to the philanthropic overtures of the Rockefeller Foundation? The answer perhaps lies in the differing perceptions of a colonial government and a philanthropic agency towards the function of science. To the British colonial administration, function of science in a colony was purely exploitative to the extent that it might be employed for the project that promises much larger profit with least capital investment. By contrast the IHB was interested much more in scientific research than in pure philanthropy. The IHB seeded several projects particularly for the eradication and control of communicable diseases, but since the colonial government was generally reluctant to funding, it felt it had no public interest in private welfare. The merit of much of the IHB projects provided points of contention among colonial health officials in Bengal. The IHB had detected well-defined causes and well-defined cures of much of the ailments in Bengal, which they argued were associated with poverty and lack of sanitation. This perhaps called for an involvement in the much more complex issues of poverty and social inequality in colonial Bengal, and consequently the IHB withdrew from much of the public health works and put its funding into supporting medical research in laboratories and providing fellowships promising scholars.

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Trauma of Tuberculosis: Medical Intervention, Containment and Popular Response in Post-Independence India

Achintya Kumar Dutta

Introduction

Tuberculosis has been known to India from the remote past by different names, such as kshayaroga, diqq or khansi-bhukar in different parts of India. But it was rampant in British India, turning to be one of the biggest health problems. It became a terrible scourge, causing huge mortality and morbidity in the subcontinent. It killed more young men and women than any other infectious disease. Even today, India has more new tuberculosis cases annually than any other country. The burden of tuberculosis is heavier than the other fatal diseases combined. Despite having modern medical technology and effective chemotherapy, thousands of people continue to die every year, about five lakh per year, one every minute. About two million cases now occur annually in India. Many cases still remain undiagnosed due to a lack of patients' awareness about the disease and also of the facilities for diagnosis and treatment. Tuberculosis still stands to be a public health challenge to India. This essay is a humble attempt to shed light on the success and limitations of the official measures for the containment of this disease and also on the response and reaction of the people, particularly the patients, their families and the neighbours to this disease and its treatment.

India made considerable progress in the domain of disease control particularly in the first two decades after independence. Smallpox was expunged; mortality from malaria and other communicable diseases decreased considerably, and cholera was no longer a health problem. The general mortality rate of the population has been reduced

and life expectancy has been increased to a great extent. Health infrastructure with extensive network of primary health centres, hospitals, specialized institutions and pharmaceutical companies for production of drugs and vaccines developed. But this did not last long. India witnessed a decline in the quality of health service during the last quarter of the twentieth century owing mainly to obsessive preoccupation with the Family Planning Programme at the cost of utter neglect of health service needs of the people, the imposition of concepts and ideas on health matters by the international agencies, dependence on monetary and technological aid from the international institutes and thereby losing of self-reliance on policy matters in public health, and above all promotion of privatization in health care system.[1] The new health care system was not flawless and the health needs and health services were not matched. Disease prevention and health maintenance were not emphasized and the most vulnerable social groups remained largely excluded from health services.[2] The poor state of health care system is illustrated by the resurgence of communicable diseases of which tuberculosis had the highest incidence.

Tuberculosis is a specific infectious disease caused by a bacterium called Mycobacterium tuberculosis (Mycobacterium is the generic name proposed by Lehmann and Newman in 1896) which enters into human body through invisible particle of moisture, on which the tubercle bacilli float in the air, when these particles are inhaled by human beings. Generally, tubercular infection results in most of the cases from the inhalation of tubercle bacilli disseminated in droplets discharged on coughing by persons with open pulmonary lesions. Infection may also come from ingestion organisms transferred from the mouth on fingers or articles such as feeding utensils which have been contaminated by an infected person. Sputum is the primary tool of transmission and therefore indiscriminate spitting is a very important means of spread of the disease. The disease primarily affects lungs and causes pulmonary tuberculosis, which constitutes 80 per cent of cases. It can also affect intestine, bones and joints, lymph glands, skin and other tissues of the body, causing what is termed

extra-pulmonary tuberculosis. It spread from infected persons with open lesions to healthy persons, depending on several factors, such as the virulence of the bacilli, the number or quantity introduced simultaneously into the organism, the sensitiveness of the individuals, etc. Generally pulmonary tuberculosis was very much common and bovine tuberculosis was very rare in India. There is no doubt that it was a major cause of poor men's sufferings, disability and death. It attacked people of all ages ranging from infant to old man and no caste, class or community was immune to it.

Disastrous damaging

In 1947, tuberculosis probably ranked next to malaria as a cause of death and in the following years while malaria mortality dropped sharply, the prevalence and virulence of tuberculosis remained almost unaltered.[3] Surprisingly, despite launching various tuberculosis control programme at the national, state and district levels from 1962 onwards, the mortality rate was high even in the beginning of the present century. Official reports reveal in 2001 that India accounts for nearly one third of the global burden of tuberculosis, and the disease is one of India's most important public health problems; everyday in India more than 20000 people become infected with the tubercle bacillus, more than 5 000 develop the disease, and more than 1000 die from tuberculosis. In India, tuberculosis kills 14 times more people than all tropical diseases combined, 21 times more than malaria, and 400 times more than leprosy, and it could not be claimed, as observed by the World Health Organization (WHO), that the disease was in decline.[4] Dr PV Benjamin, Tuberculosis Advisor, Government of India, estimated in the early 1950s that about 500000 people died every year in India of tuberculosis, the mortality rate being higher in the urban areas.[5] However, it is very difficult to know the exact number of people killed by it because of misdiagnosis and inaccurate registration. It kills more people in India than HIV, malaria, leprosy, and 'tropical' diseases combined, taking a toll of 500000 lives and infecting about 2000000 people annually and this is reflected in the following table:

Number of deaths in India in 2002

Disease	Number of deaths
Tuberculosis	421000
Malaria	20000
Measles	190000
HIV	179000

(Source: *TB India 2002: RNTCP Status Report*, Central TB Division, Director General of Health Services, Ministry of Health and Family Welfare, New Delhi, p. 5).

Despite the support of the international agencies like the WHO and the World Bank, India is still facing the threat of this disease and yet to be successful in preventing it. Though tuberculosis remains a world-wide public health problem, most of the cases occurred in the developing countries, as stated in the WHO report.[6] Tuberculosis appeared to be a major health problem in India in the early 2010s. It is estimated by World Health Organization that about two million TB cases occur in India with mortality of about 0.28 million.[7]

More importantly, the socio-economic impact of this disease is considered to be devastating because it has affected all age group and mostly (about 80 per cent) the economically most productive age group (15-54). The socio-economic costs of their attack by tuberculosis were enormous as they were the bread-winners, and the parents of the young children who needed their economic and mental support in order to thrive.[8] Even in the early 2000s, lower socio-economic groups were found to be at higher risk of getting TB as it spread in crowded places. It caused huge economic loss to the country. It decreased a person's capacity to work and Indian worker with tuberculosis lost on an average about 83 work days because of the disease, 48 of which were lost while shopping for diagnosis, and considering the 2 million new cases reported annually in India, the national loss per year worked out to 166 million lost work days at a cost of about $ 200 million.[9] In other words, every year, as estimated in 2001, more than 17 crore work days were lost to the national economy on account of tuberculosis, at a cost of Rs 700 crore (US $200 million).[10]

Official reports at the beginning of the present century give a horrible picture of tuberculosis problem in India. It is known that tuberculosis killed more women in reproductive age group than all causes of maternal mortality combined.[11] Nearly one-third of female infertility in India was caused by tuberculosis. Indian women suffering from tuberculosis tended to neglect their illness till they were too sick. Moreover, they depended on others to get necessary medical attention. The triple burden of housework, child-care and employment left very little time for women to get proper treatment for tuberculosis. Moreover, women with tuberculosis were stigmatized — many of them faced indifference, rejection and physical abuse from their family members. More than 100000 women were rejected by their families each year because of TB.[12] It had adverse consequences on the well being of the affected families and especially on children. It caused a large number of children becoming orphans. Nearly one-fifth of school age children of tuberculosis patients, either left the school or took up employment to help support their families. An official report reveals in 2001 that every year in India, 300000 children left school on account of their parents' tuberculosis.[13] Because more than three-quarters of people with active tuberculosis were in the economically productive age group (15-54 years), the economic and social costs to them and the society as well were huge. On an average, 3-4 months of work time were lost if an adult had TB, resulting in the loss of 20-30 per cent of annual household income.[14] This report illustrates further that it caused an annual expenditure of more than Rs. 13000 crore from Indian exchequer in addition to the amount (645 crores) spent by the patients in seeking private care for tuberculosis. It added to the burden of treatment expenses and thereby exacerbated their poverty. In fact, tuberculosis and poverty made a vicious cycle, one showering its curse collaterally on another. Tuberculosis aggravated poverty and poverty made the poor vulnerable to it. The poor sought and received inadequate health care that often inhibited the detection of TB and added to the impact of the disease. Treatment, if received at all, was often inconsistent or partial. The health and death worsened poverty for survivors and caregivers.[15]

A study conducted by the Tuberculosis Research Centre (TRC), Chennai in 1997 demonstrated that 8 per cent of rural and 13 per cent of urban children (equivalent to 300 000 nationally) were taken out of school when a parent (usually the father) developed TB. Other long-term consequences included indebtedness; more than two-thirds of the households went into debt to cover the costs due to TB; the average family debt was US $ 59 which is equivalent to 12 per cent of the annual household income.[16] This continued burden of disease was particularly tragic because tuberculosis was nearly 100 per cent curable. It is presently one of the biggest public health problems in India and the burden of suffering caused by tuberculosis in India is enormous.

Besides having a pernicious impact on the population of the country, tuberculosis affected the familial and social relations. It also impaired the mutual friendship and affection amongst the neighbourers. The neighbourers stopped coming to the house of the tuberculosis patient and refused to extend their help to the affected family albeit there was close affinity between the two.

The disease was so panicking that the friends, relatives and the neighbourers refused to come near the infected patient or the family for fear of catching infection. Such a family was deserted by its neighbours. The infected family could neither migrate to a new place nor was able to remain in the place they lived. On many occasions, the relation between the patient and the family members became strained, because the former appeared to be a burden, financially and socially, to the latter. The disease also worsened the husband-wife or parent-daughter relationship. For instance, a married woman when attacked by tuberculosis was not accepted by her in-laws and left to her father's house. Even the father then could not keep his daughter with him because of fear of being socially excluded. When he abused his daughter for this misfortune, the latter attempted to commit suicide. The tuberculosis affected tenant was asked by the landlord to vacate the house along with his wife and child.[17]

Contour of new health policy

Health policy changed following independence. Control of epidemic diseases received priority and modern medical technology was

extensively used; both preventive and curative measures were emphasized. India witnessed unprecedented success in the first two decades after independence in the fight against communicable diseases. India, with limited resources, was able during this time to make an effective containment of malaria reducing death rate to almost nil by the mid 1960s, to eradicate smallpox and plague, to contain cholera, and to reduce remarkably maternal and infant mortality rate. But the success was short lived, because instead of providing liberal funding for sanitation, nutrition and disease prevention, India emphasized the family planning programme from the 1960s.[18] More importantly, National Health Policy of India formulated in 1983 in the light of Alma Ata Declaration (1978) failed to attain self sufficiency in providing primary health care. Primary health care implies protection of the people from the inroads of the communicable diseases. But India could not make much headway independently in this regard owing to certain limitations of her health policy. India's disease control programmes were dictated by some international agencies that emphasized and recommended modern medical technology instead of any socio-economic changes. However, disease control and prevention programme suffered from a lot of constraints. There was an absence of surveillance and epidemiological surveys to get a more accurate understanding of the changing profile of disease prevalence and incidence.[19] By encouraging private participation in health care service, the government indirectly avoided its responsibility for providing better health to the people and failed to fulfill the target of health for all by 2000. On the other hand, compared to the growing demand, public investment in health care system was meager. This resulted in the neglect of facilities in the public hospitals and health centres, and of research and development to promote technological innovation in disease control and prevention programme.[20]

Public expenditure on health in India increased from 0.22 per cent in 1950-51 to 1.05 per cent during the mid 1980s, and stagnated at around 0.9 per cent of the GDP during the later years.[21]

But bulk of this amount was spent for recurring expenditures,

such as salaries and wages, drugs, consumables, etc., and consequently only a fragment of it was spent for prevention and control of communicable diseases. In fact, low priority was given to the prevention aspect of the infectious diseases. Generally the public expenditure on health in India was meager and it was far lower (23 per cent) than that of Japan (80 per cent) in the 1990s.[22] It was also reported by the World Bank that during 1997-2000, per capita total health expenditure in India was estimated to be around US $23 which was lower than that of Sri Lanka (US $31) and Thailand (US $71).[23] More importantly, there was a huge retrenchment in the allocation of health service in the general budget in the 1990s after India submitted to the conditions laid down by the IMF, and that consequently a greater retrenchment was made for the disease control programme — 40 per cent cut in the malaria control and 20 per cent in the tuberculosis control programmes.[24]

Though health is a State subject and health sector is mainly funded by the State Governments, public health expenditure by State Governments was similarly low. The paucity of public investment in health matters cannot be denied and there has been no remarkable change in it even in the present century. In fact, National Health Programme that covered vector-borne diseases suffered from acute shortage of funding and consequently there was a huge gap between the policy and the practice. Public health centres have been set up in many parts of rural India, but they are ramshackle huts lacking doctor, medicine and pathological laboratory for diagnosis. All these had an adverse effect on the quality of care and utilization of public health services. It is against this background that one has to look at the state's policy to tackle communicable diseases.

Medical interventionism

In understanding the magnitude of the problem of tuberculosis by the government, Indian Council of Medical Research helped the government by providing precise information on the extent of the problem and devising ways and means to be employed for a mass campaign against the disease. It organized a tuberculosis survey on a national basis (1955) in different zones around Calcutta, Delhi,

Hyderabad, Madanapalle, Patna and Trivandrum, highlighting the incidence of the disease, its relation to existing socio-economic condition, and the necessity for giving a priority to anti-tuberculosis measures.[25]

The Union Government of India therefore decided to tackle tuberculosis along with malaria and smallpox on a national basis and a five-year national programme was formulated for controlling tuberculosis with an emphasis on extensive use of BCG (Bacillus Calmette and Guerin) vaccination and spreading the treatment facilities, which was approved by the Planning Commission and included in the First Five-Year Plan. In the late 1940s, the harmlessness and efficacy of the BCG had been established in the medical world, promising to reduce tuberculosis incidence. The Government of India after careful consideration of the question decided to bank on it as a preventive measure.[26] In November 1948, India entered into an agreement with the 'International Tuberculosis Campaign' (ITC), a vaccination initiative run by Scandinavian Red Cross Societies, supervised by the WHO, and funded by the UNICEF.[27] Therefore, the BCG vaccination campaign began in 1948 in some parts and a country-wide mass campaign was launched in 1951 to cover the entire susceptible population of about 170 million in the below-20 age group.[28]

In this context, it may be mentioned that the joint venture of WHO-UNICEF and the Government of India had to face strong opposition to BCG mass vaccination campaign and counter-propaganda from the late 1940s in some parts of India particularly and strongly in Madras by the persons like A. V. Raman, former sanitary engineer, a critique of public health strategy adopted by the British India Government and Government of India, and editor of the *Peoples' Health*, and Chakravarti Rajagopalachari (known as Rajaji), the first Indian governor general and head of the Government of Madras in 1937-39 and again in 1952-54.[29] The anti-BCG movement is said to have been a reaction to modern Indian state for adopting what was considered a second-rate solution to a serious problem — use of a cheap vaccine to control TB instead of bringing about changes in environment,

sanitation and other improvements that could improve the standard of life and thereby public health. In fact, the contention centred on whether technological solution through the use of vaccination would be useful to control tuberculosis. Those in favour of BCG argued that vaccination was the most efficient measure to arrest the disease immediately whereas those opposed claimed that improving quality of life was the best solution.[30] However, the resistance only slowed down the introduction of BCG vaccination in south India but could not stop the BCG campaign.

This campaign programme continued during the period of the Second Plan also. Besides, a laboratory for producing BCG vaccine was set up at Guindy in Madras to meet the demand of the country and the number of beds in the hospitals and treatment centres increased. But the measures so far undertaken were found to be inadequate. Facilities for isolation and treatment were insufficient. There was an increase in the incidence of this disease among mines and plantation workers, but the treatment facilities for them were limited.[31] However, possibly considering the needs of the country, the Government of India on the basis of recommendation by the WHO adopted the National Tuberculosis Programme (NTP) in 1962 to check its ravages. Meanwhile, the National Tuberculosis Institute established, Bangalore (1959) developed the District Tuberculosis Programme (DTP) in 1962 as the basic unit of tuberculosis programme to be introduced across the country.[32] The NTP was essentially a permanent countrywide programme, integrated with the general health services at both the rural and urban levels. The programme attempted to detect maximum number of TB cases through the health institution and treat them effectively and to vaccinate newborns and infants with BCG. The NTP started operating through the District Tuberculosis Programme (DTP) and gradually extended its networks. The programme received momentum when the WHO and the UNICEF provided technical and material assistance respectively for its expansion and implementation.

Although the programme started slowly, it had its plan to cover the entire country gradually and from the mid-1960s the District

Tuberculosis Programmes expanded. New tuberculosis clinics had been set up in the country, and many of them were upgraded as District Tuberculosis Centres to undertake district-wise tuberculosis control in association with general health and medical institutions. Tuberculosis training and demonstration centres have been established in major states of the country. Anti-tuberculosis drugs for free treatment were supplied to the clinics run by State Governments on 50-50 sharing basis between the Centre and the States.

But the NTP could not make much headway. The district programmes encountered constraints and could not achieve desired success owing to lack of co-ordination; the states were found to be reluctant to collaborate with the programme, and thus NTP was facing challenges from the mid 1960s. As the performance of the programme was not satisfactory, the NTP was subjected to periodic critical review by the expert committees. Three reviews conducted in 1968, 1975, and 1988 revealed various shortcomings of the programme and the consequent unsatisfactory progress of the anti-tuberculosis activities.[33] A large number of patients remained outside the purview of this programme. M P S Menon lamented in his book, *Pulmonary Tuberculosis* (1983), 'Having thirty years of experience with national tuberculosis control programme the experts today agree that not only have they failed to control tuberculosis in this country but the actual number of tuberculosis cases in this country has gone up.'[34]

Finally, the Government of India, the WHO and the World Bank together reviewed the NTP in the year 1992. This review observed the failure of the NTP, focusing the fact that despite the existence of national programme, tuberculosis patients were not being accurately diagnosed and most patients did not complete treatment. The expert committee in 1992 added that less than 30 per cent treatment completion rate was achieved under NTP.[35] It was also held that stopping treatment or irregular taking of drugs by the tuberculosis patients was responsible for the failure of NTP. The review led to the adoption of a new revised strategy, known as Revised National Tuberculosis Control Programme (RNTCP), an application of the globally accepted WHO-recommended Directly Observed Treatment

Short-course (DOTS) strategy. It meant standardized short-course anti-TB treatment given under direct and supportive observation of a health worker or trained health personnel in order to ensure that the right drugs are taken at the right time for the full duration of treatment. It was started on a pilot basis in 1993, followed by large-scale implementation from 1997, and achieved nation-wide coverage in 2006.

RNTCP achieved success, by and large, detecting a maximum number of cases, and introducing a community-based tuberculosis treatment and care strategy. Since 1993, the government tried to bring more and more people under the RNTCP by providing diagnostic facilities, employing more health staff, and involving NGOs, private practitioners and community volunteers into this programme, which is being assisted by the WHO and the World Bank. It has been claimed by an official report that the success rate of RNTCP is higher than the previous programme. For instance, 545 districts with a population of 94.2 crores has been covered under RNTCP by December 2004, and since the inception of the programme in 1993, nearly 2.8 million patients have been placed on the treatment, thus saving 0.5 million additional lives. It continues that with increasing coverage of areas (about one-third of the country) under RNTCP, the number of deaths due to tuberculosis reduced from over 5 lakh to 4 lakh per year.[36]

The outlay for the RNTCP increased from Rs 86 crores in 1997-98 to Rs 130.32 crores in 2003-04, although 75 per cent of the total outlay for RNTCP was financed by the World Bank and the remaining coming from the Government of India, and through grants from other agencies.[37] RNTCP also adopted subsequently a new strategy of public-private participation/partnership to improve tuberculosis control in India. DOTS programme was decentralized in India and the treatment facilities were freely provided almost to the doorstep of the patients. Nevertheless, a large proportion of the patients still seeks treatment for this disease from the private practitioners and other alternate sources.

Critique of containment policy

Despite the development in the process of making the diagnosis, use of vaccination, and availability of efficacious drugs like

streptomycin (1943), Para-Aminosalicylic Acid (1946), isonicotinic acid hydrazide (1952), ethambutol, rifampicin and so on, and the working of the research institutes like the Tuberculosis Research Centre at Madras, the disease could not be brought under effective control and prevention. In spite of vigorous efforts by the health department, medical institutions, as also specialists working in the hospitals to cope with this disease, people are not yet free from the threat of tuberculosis. It raises questions over the success of the national anti-tuberculosis programme and the efficacy of the government's disease control policy. India's success in this field even with the support of the international agencies like the WHO, the UNICEF and the World Bank is not worth-mentioning.

Compared to the enormity of the problem, a large number of tuberculosis clinics were required in the country in the early 1950s. There were 113 tuberculosis clinics in India in 1947 and the number went to 180 in 1957, which was still inadequate for the country as a whole.[38] Moreover, the number of beds for the tuberculosis patients in the sanatoria and hospitals was insufficient in relation to requirements of the country. Attempts were made to set up new clinics, to upgrade many of the existing clinics and to provide funds for modern equipment and laboratory diagnosis. But how far these were implemented is doubtful.

There are certain limitations of the NTP and RNTCP. The NTP was adopted at the national level but unevenly spread. It had a sound sociological and epidemiological basis. But it could not yield much because of the poor organizational set-up, poor management of the control programme, poor treatment adherence, inconsistency in providing good quality treatment including supply of quality drugs, inadequate funding and poor functioning of the peripheral health institutions, both at the centre and state level.[39] More emphasis was given on case detection rather than on treatment completion and consequently, the programme suffered.[40]

Many of the villages and small towns lacked adequate medical facilities. Accommodation for the indoor patients was not up to the mark, and even the supply of drugs was not sufficient. Many of the

hospitals lacked requisite quantity of costly but effective drugs. Moreover, the attitude and practice of rural health unit staff acted otherwise and the lack of enthusiasm amongst medical officers as well as general health workers seems to have been one of the primary reasons for missing large number of case detection, misdiagnosis and mistreatment. Training was deficient, equipment was not supplied in time and microscopes were lying around in packing cases for year.[41]

The control programme could not remarkably check the process of stopping treatment and irregularity of treatment. It is often argued that the noncompliance and conservative attitude of the patients to treatment stood in the way of making treatment campaign successful. But the patients should not be wholly blamed for it. There was shortage of clinics or treatment centres to cater to the needs of the people. The stopped treatment cases were found to be low when the patients received the treatment nearer to the residence or work-place without wasting time.[42] National Tuberculosis Institute, Bangalore revealed that the reasons for the non-adherence to treatment by the tuberculosis patients were mainly due to referral to a hospital or medical advice given to stop the treatment. It further adds that a large part of the non-compliance attributed to the patients was caused by the operational weaknesses of the NTP including the erratic drug supply and variable performance and commitment of the staff involved.[43]

Besides, there was lack of effective awareness campaign about the disease and its treatment. A study by the National Tuberculosis Institute in the 1960s showed that about 50 per cent of the sufferers had tried to seek treatment from modern medical institutions; another 25 per cent were not sufficiently motivated to seek treatment, though their physical symptoms caused by pulmonary tuberculosis made them worried; and the rest neither sought treatment nor were concerned for symptoms. Thus the existing health care service failed to convince the tuberculosis patients about the credibility of the treatment facilities and consequently, they had hardly any confidence in it.[44]

Amazingly, the NTP suffered from lack of funding and also from non-utilization of budgetary allocations, both at the national and the state level. In the 1960s and 1970s, NTP did not receive priority in

terms of public investment. The Government of India provided major funding to other programmes like malaria eradication and family planning. An average of more than Rs 10 crore (100 million) was allocated annually to malaria eradication programme and the budgetary allocation for family planning rose from Rs 1 crore per year during the second plan to more than Rs 60 crore per year during the fourth plan, whereas, by 1966, NTP was set to receive Rs 33 crore for the entire fourth plan period, or just above Rs 6 crore annually.[45] The picture appeared to be similarly grim in the next two decades. Of the central plan outlay, only between 2 per cent (1982-83) and 1.7 per cent (1990-1991) were allocated for health, and of this only 0.8 per cent and 1.3 per cent respectively were for NTP.[46] In the general neglect of public health in the country, tuberculosis has suffered even more. The budgetary allocation for tuberculosis had been grossly inadequate despite being increased to Rs. 50 crore in 1995 from a mere Rs. 2 crores in 1980-81.[47] These allocations were sufficient to treat only 30 per cent of the patients completely. Therefore, the cure rate of the previous NTP was around 30 per cent.

The DOTS strategy under RNTCP was a highly sophisticated one and well designed, ensuring availability of diagnostic facilities, trained health personnel and medicines but had little effort or budgetary resources for tackling the root cause of the disease, for spreading awareness about the strategy, for social mobilization to see that people in need could get treatment.[48] The quality of monitoring and supervision, which was a must for its success, has not improved at all levels — the Centre, State and District. The programme is said to have been affected by the shortage of health staff. The RNTCP was implemented by a few officers from the regular services and supported by services of consultants who had been hired on contract and could be withdrawn at any time. This must have affected the management of the programme in the long run.[49]

The BCG vaccination programme was loosely organized, the potency of vaccine, techniques of vaccination etc. had been neglected by the health workers.[50] The WHO and the UNICEF had little experience with mass vaccination campaign in a country like India.

The BCG vaccination-based tuberculosis control programme managed to retain a high profile within the corridors of power in New Delhi and the state capitals, which was run and advertised with assistance received from the international agencies like the WHO and the UNICEF.[51] However, the NTP and RNTCP were imposed from above in a complex administrative manner to be implemented at the behest of international agencies through central, state and district-based health organizations. Consequently, all instructions were not uniformly introduced across the country.

Undeniably, there were disagreements over the changes in the policy and implementing methods at different levels of administration. For instance, the idea of integration of tuberculosis control with the general health care as reflected in the NTP was not accepted either by the general health care personnel or by the tuberculosis personnel. Amazingly, in cities and higher levels of health organization, integration was regarded as unnecessary. The integrated approach was advised to be confined to the rural areas only by the higher officials, who were associated with the higher level health control programme and exercised influence on account of expert clinical services rendered by them to those in political power, and some of them even advocated for constituting independent units for the metropolitan cities, having different approaches to the problem of tuberculosis.[52]

Sometimes the states were reluctant to implement the programme as it was conceived. For instance, Tamil Nadu wanted to have DOTS for the entire six-month period instead of the first two, Maharashtra denied the programme to be implemented in phases in the districts, and Gujrat adopted the measure of case-detection on a house-to-house basis to start with.[53] Though these were subsequently resolved, these differences must have affected the effective implementation of the programme. It has also been reported that the DOTS strategy had not been universally used for the treatment of tuberculosis even in the districts covered under this programme, and amazingly the All India Institute of Medical Sciences, New Delhi and many medical colleges did not use DOTS strategy.[54] Recent studies reveal that while

developing RNTCP, the central unit ignored National Tuberculosis Institute and Tuberculosis Research Centre, Chennai, and in the process the central unit must have lost considerable amount of credibility for the RNTCP, at least in the initial years, and considerable input had been received from international agencies like the WHO and the World Bank.[55]

Surveillance, the watchword of disease control programme, seemed to have been poor in the country, despite the National Surveillance Programme for Communicable Diseases launched during 1997-98 by the Government of India. The bulk of the tuberculosis cases were concentrated in the rural and semi-urban areas where ordinary poor people lived. Their ignorance, lack of means and no easy access to health facilities prevented them from seeking early medical help. But there was not strict monitoring in these areas. There was a need for continuous surveillance for drug-resistant tuberculosis where DOTS strategy was being implemented to cover an increasing number of districts. TB being an infectious disease, the technical requirement was to find and detect the positive cases and render them non-infectious through treatment. A close and continuous surveillance for several years and regular, uninterrupted supply of anti-tuberculosis drug were essential for it. The improvement of the general economic condition including the standard of living of the common people, adequate provision of case detection and treatment, and introduction of effective preventive measures were required for the control of this disease. But the government paid no heed to these matters. All these would entail millions of rupees from the government exchequer for many years. Disease prevention was not prioritized and hence budgetary allocation for it was low.

Patients, families and neighbourers

The people of India were generally not opposed to NTP and there is still hardly any evidence that they stood in the way of implementation of RNTCP. Obviously, there were fear and stigma of the disease amongst the patients, families and the neighbourers. People having some knowledge of the nature of tuberculosis were terribly

afraid of the disease. Some might have had the lurking fear that they got infected, but when asked for examination they tried to evade it for fear that it could confirm their suspicion. On many occasions, tuberculosis victims succumbed to treatment when chest pain and allied problems became unbearable. Even then, tuberculosis patient took home made medicine or those advised by friends and relatives. Many resorted to herbs while some moved to temples or shrines for remedies. When these measures failed to give them relief, they sought treatment at the dispensary. But adequate medical facilities were not available for them in the small villages and towns. Moreover, the labourers were reluctant to attend clinic for examination and check-up, for standing in the queues meant to them losing several hours and consequently the day's wages.

Usually, most of the patients were scared of tuberculosis. It created such a panic among them that they could not believe when diagnosed that they had tuberculosis. Some of them even reacted in a peculiar manner and burst into anger when diagnosed as a case of tuberculosis. One such patient shouted at the physician, 'There must be something wrong with your brain. How can I have tuberculosis in spite of my well-developed muscle'? Another patient remarked, 'How can I have tuberculosis when it has never been in my family before'?[56] There were patients who declined to accept the diagnosis and moved from one doctor to another hoping for a different diagnosis. In fact, the general reaction of the patient to the diagnosis was one of fear and despair, though the ways they responded and reacted differed. Many patients felt guilty, helplessness, loss of self-esteem, and became resented and apathetic towards others owing to interaction of complex psychological factors.[57]

Tuberculosis posed a threat to the victim's self-esteem because it threatened one's own position and social status and inter-personal relationships. Thus there was despair, depression and disappointment among the patients.[58] They feared taunt, abuses and hatred from the family members and neighbours, social exclusion and desertion. Surprisingly, some of them had to face utter consequences for being TB patient; some became fugitive and beggars while some others

committed suicide to escape the inner turmoil and tension.[59] The response of middle-class family in Bengal can be ascertained from the Bengali novel, *Meghe Dhaka Tara*. The family members and relatives of Nita, the heroine of the novel, who was the only earning member of the family, were shocked on hearing that she had tuberculosis. She was reluctant to receive treatment but ultimately admitted to a sanatorium, far away from her home and none of her relatives met her for a long time for fear of catching the infection.[60] This kind of reaction of the relatives and neighbours, as was also found in the case of leprosy victims,[61] might possibly have weakened the patients mentally and morally to undergo treatment. It appears that what these patients needed was affection and soft and compassionate voices of the relatives alongside the treatment.

In fact, the people were more afraid of the effects of the disease on their social life than the disease itself. It indicates that the social stigma was deeply attached to the disease and played heavily on the mind of the people and it still counts in our society. Since most of the people regarded this disease as hereditary, the family of the tuberculosis patient was often branded as tuberculous. In some cases, the stigma attached to the family disqualified it from matrimonial alliance with families free from tuberculosis. Consequently, tuberculosis patients and their relatives as well kept the disease secret and hence the diagnosis was often ignored or misinterpreted for fear of being branded as tuberculous for the rest of their lives.[62] It is known from a medical journal that while interviewed a number of TB patients undergoing treatment in hospitals and dispensaries in rural areas in a district of western India, many of them preferred to keep their illness as secret while many did not accept the diagnosis. Many of them had low esteem of themselves since they had the disease. Some felt that the community would give them less respect if their diagnoses were made known. Even a handful of them perceived that there would be problems in getting married even after they were cured.[63] It is known from a study conducted in 1997 at the Rajan Babu TB Hospital in New Delhi that out of 550 patients mainly from middle-class families, 59.6 per cent patients lost their self-esteem, 16.3 per cent showed apathy towards the world, and 15.9 per cent were so depressed that they thought of committing suicide.[64]

Most of the women expressed negative reaction to diagnosis of tuberculosis such as fear, shock and despair. A young married woman was afraid that during her illness her children would not be taken care of and that they would be disliked for belonging to a tuberculous family. Like the affected old people, women also feared of being deserted or detached from the family, and because of the fear they refrained from reporting their cases to doctor and from treatment.[65] The wage earners also feared of losing his job and consequently his position in the social circle. Even the older age-groups over 50-55 were upset by the diagnosis, not because of fear of death but being a burden to the family. All these mental disturbances and tensions made the people convinced that tuberculosis was a curse and it could not be cured. Many of them felt that it was because of their misfortune or misdeeds and hence showed negative attitude to disease and even to its treatment. Their apathy to the diagnosis and treatment was further reinforced at the same time by the absence of adequate diagnostic and treatment facilities. Sometimes the sufferers felt dejected because of lingering sickness and devitalization owing to this malady. Even the people better instructed than the illiterate patients coming from backward community behaved similarly. Thus the response of the tuberculosis victims and their families to this disease and its treatment was largely dictated by socio-economic conditions. People's reluctance, non-adherence and irregularity to treatment might have affected control programme. But on each of the occasion, they were bound to show this attitude. The economic condition, availability of employment opportunities, familial responsibilities and so on kept them away from the treatment. It is known that many temporary inhabitants who came to the cities like Delhi turned to be defaulter in the process of treatment owing to their poor economic condition and familial responsibilities.[66]

Nevertheless, the dreadfulness of the disease seemed to have compelled many patients to be responsive to the anti-tuberculosis treatment. They inclined to receive treatment to get rid of affliction and allied troubles. That the people were ready to receive treatment is proved by increasing number of patients attending hospitals and

dispensaries. Many of them were ready to receive treatment from nearby modern hospitals but had certain reservations to be treated as indoor patients in the far-off sanatorium. They probably felt that once admitted in the sanatorium they would be cut off from their relatives. This was a kind of ruthless segregation of a member from the family. They apprehended that there could be lack of compassion and care in the sanatorium and the disease might take an adverse turn. They were familiar with the traditional medical care based on community healing and family care in which the patient was treated in body and mind in his personalized circumstances. Some orthodox patients denounced the idea of getting admission in a hospital or sanatorium because they could be attended there or served food by people belonging to low cast.[67] There were instances of a number of patients willing to undergo institutional treatment not only because they wanted to be cured of, but also wanted to leave the home lest other members are infected. This tendency was found amongst the middle-class people who had the education to understand the nature of the disease and how it spread.[68] The middle class educated people were found to be responsive to the health propaganda and awareness programme of the government and private agencies.

Thus the victims' attitude to the prophylaxis was determined by the severity of the disease, easy availability of health care facilities and their affordability. On many occasions when the treatment facility was inaccessible or could not give them relief, they resorted to religious practices for their mental and moral reinforcement. The social stigma of tuberculosis seems to have not yet been removed completely from Indian society. There still exists the general tendency to conceal the cause of death in tuberculosis cases for fear of social disabilities. Despite campaign through advertisements and health education about this disease and its cure, old conservative social attitudes towards it have been surviving through the ages. It is not yet regarded as a common disease like dengue or malaria. Certain sections of the people still believe that tuberculosis is incurable and an impediment to marriage. Tuberculosis is also considered a social 'untouchable'. This negative attitude may be said to have affected the tuberculosis control

programme to a certain extent. People's awareness about the disease, its aetiology as well as cure is a must for eradicating this stigma.

Conclusion

It is because of all these weaknesses that tuberculosis continues to be a serious health problem in India. The Ministry of Health has been trying to make India free from tuberculosis for the last couple of decades, but that still remains to be a dream. In fact, disease control and prevention programme as a whole was not laudable. Following the British legacy, public health service continued to function within the periphery of biomedical paradigm dominated by curative aspect, and therefore prevention and eradication hardly received any significance in the popular perception. The health planning in India dissociated technological from socio-economic strategy of disease control.[69] Despite expansion of the RNTCP, tuberculosis was reported in the official health report of India in 2013, as reflected in the previous reports, to be a major health problem.[70]

Tuberculosis is nearly 100 per cent curable, yet thousands of people continue to die every year in India. Indian control strategy, DOTS, has been successfully utilized by many countries in the world in controlling tuberculosis, but surprisingly India lagged behind. It reinforces the observation that government's lackadaisical attitude to disease management facilitates the prevalence of the infectious diseases in a way or the other. In other words, like the colonial administration, the Government of India and the provincial governments as well have failed to fulfill their social obligation to protect the health of the people from the lethal communicable diseases. Tuberculosis appears to be more a social disease than medical, because its prevalence and intensity vary in accordance with the social and economic conditions of the groups of people which are affected. The poor and under-fed are the worst sufferers because they suffer from under-nutrition and thereby physical weakness. The weak physique lack resistance and hence is susceptible to tuberculosis infection. So prior to diagnosis, the tuberculosis victims required adequate and nutritious food and that could have reduced the chance of spread of tuberculosis. Even

the tuberculosis patients under treatment needed the right food and rest, because medicine could cure the disease but could not rebuild his physique. Unfortunately, the poor patient had hardly any such scope of having food and rest. But biomedicine, not social medicine gripped the attention of most of the health experts and also the state authorities. It can be assumed that medical science alone cannot eradicate the infectious diseases from a country; it can help in reducing the disease burden by providing palliative measures only but cannot strike at the root of the problem. With its knowledge base and growth potential, India is capable of achieving more in health matters. The major task ahead is to prevent and eliminate the communicable diseases. It requires desire, determination and devotion.

Notes

[1] For details, see Debabar Banerji, 'Landmarks in the Development of Health Services in India' in Imrana Qadeer et.al., eds., *Public Health and the Poverty of Reforms The South Asian Predicament*, New Delhi: Sage Publications India Pvt Ltd, 2001, 39-50.

[2] Cited from Roger Jeffery, *The Politics of Health in India*, Berkley: University of California Press, 1988, 116.

[3] Roger Jeffery, *The Politics of Health*., 135.

[4] *TB India 2001 RNTCP Status Report*, New Delhi: Central TB Division, Directorate General of Health Services, Ministry of Health and Family Welfare (MHFW), 6; *Stopping Tuberculosis*, New Delhi: World Health Organization, Regional office for Southeast Asia, 2002, 2-3; *WHO Report 2006 Global Tuberculosis Control: Surveillance, Planning, Financing*, Geneva: World Health Organization, 92; K Park, *A Textbook of Preventive and Social Medicine*, Jabalpur: M/S Banarsidas Bhanot, 2005, 18th edn, 147.

[5] P V Benjamin, 'Tuberculosis in India', *Indian Medical Forum*, vol. III, No. 7, July 1952, 73-78.

[6] *Stopping Tuberculosis, 2*.

[7] *Annual Report 2012-13 of Department of Health and Family Welfare*, New Delhi: MHFW, Government of India, 2013, 94 (Shastri Bhavan Library, New Delhi, hereafter SBL).

[8] *TB India 2002, RNTCP Status Report*, New Delhi: Central TB Division, MHFW, 7.

[9] K Park, *A Textbook of Preventive Medicine*, p. 147.

[10] *TB India 2001 RNTCP Status Report, p. 7.*

[11] *NCMH Background Papers: Burden of Disease in India*, New Delhi: National Commission on Macroeconomics and Health: MHFW, September 2005, 12.

[12] *TB India 2001: RNTCP Status Report*, 7; *NCMH Papers: Burden of Disease in India*, 12.
[13] *TB India 2001: RNTCP Status Report,* 7.
[14] Ibid., 12.
[15] *TB India 2002, RNTCP Status Report,* 7.
[16] Ibid., 6.
[17] G R Banerjee, *The Tuberculosis Patient*, Bombay: Tata Institute of Social Sciences, 1968.
[18] *NCMH Background Papers: Financing and Delivery of Health Care Services in India*, New Delhi: National Commision on Macroeconomics and Health, MHFW, Government of India, August 2005, 44.
[19] *NCMH Papers: Financing and Delivery of Health Care Services,* 45.
[20] Debabar Banerji, 'Landmarks in the Development of Health Services', 46.
[21] *NCMH Papers: Financing and Delivery of Health Care Services*, 242.
[22] Debabar Banerji, 'Landmarks in the Development of Health Services', 47.
[23] *NCMH Papers: Financing and Delivery of Health Care Services,* 241, 243.
[24] Debabar Banerji, 'Landmarks in the Development of Health Services', 47.
[25] For details, see C G Pandit and K Someswara Rao, *Indian Research Fund Association and Indian Council of Medical Research 1911-1961: Fifty Years of progress, New Delhi: Indian Council of Medical Research, 1961*, 58.
[26] BCG vaccination was first introduced in France by Calmette in 1921. Since then it had been used increasingly in most of the European countries and subsequently he advocated the administration of BCG to new-born infants. For details, see 'Medical News and Note', *Calcutta Medical Review*, vol. 15, No. 3, 1948, p. 123.
[27] ITC ran a BCG demonstration project in India for three years. For details see Christian W Mcmillen and Niels Brimnes, 'Medical Modernization and Medical Nationalism: Resistance to Mass Tuberculosis Vaccination in Postcolonial India, 1948-1955', *Comparative Studies in Society and History*, Vol. 52, No. 1, January 2010, pp. 180-209, (http://www.jstor.org/stable/), accessed on 17 Oct 2016.
[28] *The Fight against Tuberculosis*, New Delhi: Ministry of Information and Broadcasting, Government of India: The Publications Division, 1960, 7.
[29] For details of the background and reasons of the opposition and challenging the protest, see Christian W McMillen and Niels Brimnes, 'Medical Modernization and Medical Nationalism', 187-206.
[30] Christian W McMillen and Niels Brimnes,'Medical Modernization and Medical Nationalism', 185.
[31] *The Bengal Tuberculosis Association: Report of the Executive Committee for the Year 1959*, Calcutta, 4.
[32] M P S Menon, *Pulmonary Tuberculosis*, New Delhi: National Book Trust, 1983, 240.
[33] For details, see Niels Brimnes, *Languished Hopes: Tuberculosis, the State and International Assistance in Twentieth-century India*, New Delhi: Orient Blackswan Pvt Ltd, 2016, 222-24, 249-51, and 263-65.

[34] M P S Menon, *Pulmonary Tuberculosis*, 241.

[35] S K Srivastava et. al., 'Report on the Revised National Tuberculosis Control Programme; Urban Pilot Project in Lucknow', *Indian Journal of Tuberculosis*, 47, no. 3, July 2000, 159-62.

[36] *NCMH Papers: Burden of Disease in India*, 13; *TB India 2001: RNTCP Status Report*, 6, 10.

[37] *NCMH Papers: Burden of Disease in India, 15.*

[38] *The Fight against Tuberculosis, 8-9.*

[39] Editorial — 'Limitations of Conducting Community Surveys to assess the Epidemiological Impact of TB Control, Programmes on the Incidence of TB', *Indian Journal of Tuberculosis*, 55, no. 1, January 2008, 1-2; Anurag Bhargava, 'The Revised National Tuberculosis Control Program: A Critical Perspective' in Imrana Qadeer et. al., eds., *Public Health and the Poverty of Reforms*, 449-56.

[40] For details, see S K Srivastava et.al, 'Report on the Revised National Tuberculosis Control Programme', 159-62.

[41] M P S Menon, *Pulmonary Tuberculosis*, 243.

[42] Ibid., 243.

[43] For details, see Anurag Bhargava, 'The Revised National Tuberculosis Control Program', 453.

[44] G R Banerjee, *The Tuberculosis Patient*, 31.

[45] Niels Brimnes, *Languished Hopes*, 258.

[46] A K Chakraborty, 'Tuberculosis Program in India: Current Operational Issues', in Imrana Qadeer et al., *Public Health and the Poverty of Reform*, 341-60.

[47] Anurag Bhargava, 'The Revised National Tuberculosis Control Program', 449.

[48] *NCMH Paper: Financing and Delivery of Health Care Services, 49.*

[49] For details, see Achintya Kumar Dutta, *Trauma in Public Health: Tuberculosis in Twentieth-century India*, Kolkata: K P Bagchi & Company, 2018, 98-99.

[50] M P S Menon, *Pulmonary Tuberculosis*, 242.

[51] Sanjoy Bhattacharya, *Expunging Variola: The Control and Eradication of Smallpox in India, 1947-1977*, New Delhi: Orient Longman, 2006, 42; BCG vaccination was introduced as a national programme in India with financial assistance from the UNICEF and WHO in collaboration with the Union and State Governments. By 1955-56, the UNICEF and the WHO spent $12, 00,000, and also assisted the setting up of a laboratory at Guindy in Madras for the production and distribution of tuberculin and BCG vaccine. See, *The Fight against Tuberculosis*, 7. Interestingly, it became the largest single supplier of vaccine in the world, meeting the demand of India and also supplying the vaccine to Burma, Ceylon, Malay, Thailand and Pakistan. The WHO and British Medical Research Council extended cooperation to Indian Council of Medical Research to establish a Tuberculosis Chemotherapy Project in Madras in order to have precise scientific results of the home treatment.

See, Pandit and Rao, *Indian Research Fund Association*, 59. The WHO also sent a BCG Demonstration Team to India in 1948 not only to popularize BCG vaccine but also to show to the authorities concerned the process of manufacture of the vaccine and the techniques of administration. See 'Medical News and Note', *Calcutta Medical Review*, 15, no. 3, 1948, 124.

[52] M P S Menon, *Pulmonary Tuberculosis*, 242.

[53] A K Chakraborty, 'Tuberculosis Program in India', 352-53.

[54] *NCMH Papers: Burden of Disease in India, 17.*

[55] A K Chakraborty, 'Tuberculosis Program in India', 351.

[56] G R Banerjee, *The Tuberculosis Patient*, 20.

[57] Arabinda Samanta, 'Negotiating Subalternity in Everyday Life: Social Construction of Tuberculosis in Colonial and Post-colonial India' in Deepak Kumar and Rajsekhar Basu eds., *Medical Encounters in British India*, New Delhi: Oxford University Press, 2013, 268.

[58] For details, see Bikramaditya Kumar Choudhary, *Tuberculosis in India: A Political Ecology Approach*, Saarbrucken: V D M Verlag, 2008, 137.

[59] For details, see G R Banerjee, *The Tuberculosis Patient*, 20-21.

[60] For details, see Saktipada Rajguru, *Meghe Dhaka Tara* (in Bengali), Calcutta: Granthapith, 1373 BS (1966), second edn, 84-91.

[61] For details, see Nemai Bhattacharyay, *Nachni* (in Bengali), Kolkata: Dey's Publishing, 2010, third edn, 30-39.

[62] GR Banerjee, *The Tuberculosis Patient*, 22.

[63] For details, see 'Summaries of Papers Presented at the 54th National Conference on Tuberculosis and Chest Diseases held at Patna, December 26-29, 1999', *Indian Journal of Tuberculosis, 2000, 47, 171-79.*

[64] Arabinda Samanta, 'Negotiating Subalternity in Everyday Life', 269.

[65] Bikramaditya Kumar Choudhary, *Tuberculosis in India*, 130.

[66] Ibid., 121.

[67] G R Banerjee, *The Tuberculosis Patient*, 33.

[68] Ibid., 36.

[69] Imrana Qadeer, 'Impact of Structural Adjustment Programs on Concepts in Public Health' in Imrana Qadeer et al. eds.,*Public Health and the Poverty of Reform*, 117-36.

[70] For details, see, *Annual Report 2008-09 of Ministry of Health and Family Welfare*, New Delhi: MHFW, Government of India, 2009, 2 (SBL, New Delhi); *Annual Report of 2012-13 of Department of Health and Family Welfare*, New Delhi: MHFW, Government of India, 2013, 94 (SBL, New Delhi).

Government Policies and Medical Treatment in Three Ayurvedic Hospitals in Kolkata (1970-2010).

Sutapa Saha Mitra

The present paper focuses on the historical process of rehabilitating Ayurveda within the framework of national and international regulations between 1970-2010. The paper searches into the hospital treatment of the three Kolkata based State-run Ayurvedic hospitals, diseases treated, medicines prepared and the responses of the patient community undergoing treatment of the two most pressing non-fatal diseases, chronic and non-communicable diseases of the time — Amvata (arthritis) and Madhumeha (diabetes), the silent killer. The present article highlights how in the competitive medical treatment, modern Ayurveda and the hard core Ayurvedic practitioners has cherry-picked non-fatal and non-communicable diseases as a niche for sympathetic treatment The paper also highlights the oral interviews of the patients to understand the social acceptability of this medical system along with the over-the-counter medication strategy and the ongoing researches in the field of Ayurveda to claim the safety and efficacy of the alternative system of medicine and to prove its safe usage.

Rehabilation of Ayurveda within the National framework and the World Health Organization

Ayurveda's entry within the structured framework of the government policies began as a joint-venture of the Ayurvedic revivalist movement and the Indian national movement in the 1920's.[1] The post-independent phase witnessed formation of several committees namely, the Bhore Committee (1946), the Chopra Committee (1948), Pandit Committee (1951), Dave Committee (1956), Udupu Committee (1959), Mudaliar Committee (1962), Vyas Committee (1963) and the

Ramalingaswamy Committee (1981) that stressed on the establishment of more and more educational institutes, Research Institutes imparting indigenous medical knowledge theoretically and practically, to prepare a standardized formulary for each medicine and a uniform guideline for standardized manufacture of Ayurvedic medicines throughout the country.[2] These committees attempted to provide a national platform to the age-old practice of the traditional indigenous medical system and recommended standardization to create a common platform with western medicine. The western medical system on the other hand, with its discovery of antibiotics and the demand for evidence-based practice and biomedical research increasingly moved towards molecular approaches in the search for new treatments. But the thalidomide disaster detected in 1961 in the West enhanced the concern over side effects of synthetic drugs and the need for a more humanistic management of illnesses.[3] Moreover, due to the lack of cure for chronic diseases and side-effects of conventional medicines, the developed countries started looking Ayurveda for treatments to restore wellness of their citizens.[4] As a result, the World Health Organization (WHO) enhanced the necessity of the low-risk alternative system of medicine without side-effects.[5] In 1978, WHO declared 'Health for All' as the main target in the development of health throughout the world by the year 2000 and organized the first international symposium on traditional medicine in 1999 drawing up schemes for promotion, cultivation and regeneration of medicinal plants and evolving pharmacopoeia standards.[6] Later this issue has been globally addressed in its Traditional Medicine Strategy Programme which concentrated on the objectives of policy making, safety, efficacy, quality and rational use of traditional medicine highlighting on the affordability and availability of the medicines and to promote therapeutically sound use of it by both the consumers and the suppliers.[7] In 2003, WHO provided guidelines related to quality control, suggested analytical methodology for quality assurance and validity of indigenous medicines and adhered to Good Manufacturing Practice(GMP), Good Agricultural and Collection Practices(GACP) and Good Laboratory Practices (GLP). WHO suggested that in choosing the analytical

methods availability, robustness and validity of the methods must be considered and recommended Thin Layer Chromatography (TLC), High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC) and Gas Chromatography-Mass Spectrometry (GC-MS) for quality assurance.[8] In the 9th meeting of the health secretaries in July 2004, the focus was on globalization, trade, intellectual property rights (IPR) and health. It was recommended that South-Eastern Asian Regional Office (SEARO) facilitate the preparation of a regional perspective focusing on the burden of disease and related health research and development, IPR and public health, other incentives for innovation, traditional system of medicine and capacity building, to be presented to WHO Commission on Intellectual Property Rights, Innovation and Public Health (CIPIH) to carry out their workings accordingly.[9] WHO's other programme on Traditional Medicine Strategy undertook the Medium Term Strategic Plan (MTSP) where strategic implementation reflected on essential medicines and pharmaceutical policies with due importance 'to effective and safe medicines of assured quality'.[10] To comply with the spirit of WHO regulations, Department of Ayurveda, Yoga, Unani, Siddha and Homeopathy, AYUSH, Government of India, took several measures to standardize Ayurvedic medicines. Several workshops have been organized to throw light on the need for isolation and characterization of active chemical constituents that should have the desired therapeutic action to cure different ailments. Furthermore, the workshop also proposed to test or analyze single or compound formulations available in the market.[11] It is through adaptation of new modern techniques, equipments, lab testing methods, clinical tests, standardization and quality control of the medicine as per GMP and hospital treatment methodology that Ayurveda is trying to validate its position globally. But as Madhulika Banerjee pointed out that though the WHO recommends standardization of the traditional medicines to meet international challenges and proposes urgency in evaluating herbal medicines, yet does not bear any documents of carrying out low-cost research of these systems, neither any research conducted in this field in its own standards lines[12]. Rather what WHO recommended was standardization of traditional medicines through high technology and

expensive research protocols which maximum of the developing countries are unable to conduct.

The United Nations Educational Scientific and Cultural Organization (UNESCO) in its International Bioethics Committee also included the subject of Traditional Medicine in its work programme in 2010-11. The committee discussed on the practice of traditional medicine by the traditional practitioners throughout the world on issues of safety, efficacy, bio-piracy, non-discrimination. It suggested guidelines for action which included benchmarks for action, education and integration through regulations, with more rationality, scientific methods and means and quality control under its dictated terms.[13]

The present article titled, 'Government Policies and Medical Treatment in Three Ayurvedic Hospitals in Kolkata (1970-2010)', attempts to understand the impact of the alternative medical treatment on some of the diseases with emphasis on the two most pressing chronic and non-communicable diseases of the present time — rheumatoid arthritis and diabetes. Amavata is considered as a disease in Ayurveda, taking place in the joints whose features like pain, stiffness, swelling, tenderness are identical to that of the Rheumatoid Arthritis (RA) in modern parlance. This article attempts to bring out the regulations of the World Health Organization since the Alma –Ata conference in 1978, the Indian and state government policies, in the case of indigenous medical system, standardization of traditional medicines to make it more efficacious to understand the social acceptance of this system. Moreover, the WHO chalked out a comprehensive policy for Traditional Medicine providing it a global recognition and hence the need to determine the quality control, safety and efficacy of the traditional medicines.

The historical process is geared and rooted to the emergence of the global medical regulatory process that led to newer levels of standardizations mandatory in the field of medical treatment and prescriptive medicines. The search is further extended through oral interviews of the doctors and patients on the diseases treated through Ayurveda, in the Kolkata based three Ayurvedic hospices, to understand the purpose behind their opting for Ayurvedic treatment. The oral interviews become a part of the historical process when the findings

corroborate with recommendations of the policy making and their implementations are taken into actions which are viewed in these interviews. The paper therefore intends to understand the complexities of the historical process of rehabilitating Ayurveda and its shifting paradigm in the international and national regulations, hospital treatment and social acceptance through patient interviews along with the changing nature of Ayurvedic treatment and research. Moreover, the impact of globalization on the traditional system of medicine and the matters of social acceptability and those opting for the treatment of chronic, non-fatal disease is also a matter of observation in our area of study.

Role of AYUSH in West Bengal.

In the West Bengal scenario, the propositions dictated by WHO has been implemented by the State Pharmacopoeial Laboratory and Pharmacy for Indian Medicine, Kalyani, Nadia for standardization of Ayurvedic medicines. The Department of Indian System of Medicine and Homeopathy renamed as Department of Ayurveda, Yoga, Unani, Siddha and Homeopathy (AYUSH) in 2003 undertook to review the list of Essential Drug List of ayurvedic and homeopathic drugs and prepared a list of 277 Ayurvedic medicines categorized under different groups namely-Asavas, Arka Kalpana, Avaleha, Khand, Pak Kalpana, Kwath Churna/ Kasayam, Gugggula, Ghrita, Churna-Multi-ingredient, Churna-Single ingredient, Lavana, Lavana and Kshar, Lepa for local application, Vati and Gutika, Varti, Netrabindu, Anjana, Sattva, Kupikpakva Rasayana, Parpati, Pishti Kalpana, Bhasma, Mandura, Rasayoga and Lauha.[14] Apart from this there are numerous patent granted (Indian Entities) for Ayurvedic and Herbal based medicines by Indian Patent Office of which several patents were granted for herbal composition on skin ointment, controlling blood sugar, for stress management.[15] Furthermore for standardization of ASU&H drugs, four different Pharmacopeia Committees are working to prepare official formularies to evolve uniformity in preparation of drugs along with prescribing standards for single drug or compound formulations.[16] In the time frame of our study it is noted that in 1978-79, West Bengal reports 5 Government hospitals and 73 dispensaries where Ayurvedic treatment

was dispensed.[17] As regard to licensed pharmacies it records 355 in 1975.[18] On the other hand, the regional branch of AYUSH operating under the administrative control of the Department of Health and Family Welfare, Government of West Bengal records that in 2010 there are four Ayurvedic/ Pharmacy Colleges where 3 are state-owned and 1 is private.[19] Of these it records of 409 beds which converted in percentile shows 0.2% and 0.9% respectively whereas the highest is 1774 (72.9%) hospitals and 10300 beds (23.5%) in Uttar Pradesh. The record further shows that in West Bengal there are 295 AYUSH dispensaries (1.9%), the highest being 3568 (23.6%) in Rajasthan.[20] AYUSH provides state-wise statistical data about the prevailing condition of Ayurveda and its progress in the prevailing years. It records that over the years West Bengal has 4 Ayurvedic hospitals with 409 beds which in percentage shows 0.2% and 0.9% respectively as compared to 1774 (72.9%) hospitals and 10300 (23.5%) beds in Uttar Pradesh. It shows that in West Bengal there are 295 AYUSH dispensaries (1.9%), the highest being Rajasthan 3568 (23.6%). In West Bengal AYUSH hospitals under Central Government limits to 1 with 20 beds under Central Council for Research in Ayurvedic Sciences (CCRAS) at National Research Institute of Ayurveda for Drug Development (NRIADD), Kolkata. As regards to state-wise licensed pharmacies West Bengal have one hundred sixty-nine licensed Ayurvedic pharmacies of which two is only government run and the rest are private run where only one hundred twenty-nine are GMP licensed and the rest forty are non-GMP.[21] A comparative study between the 1978 and 2010 of the West Bengal scenario shows four times increase in the number of dispensaries under Ayurveda in 2010 indicating an upward graph but on the other hand decrease in the number of licensed pharmacies. On the other hand, in the Indian scenario West Bengal presents a bleak picture in comparison to other states in the number of Ayurvedic dispensaries and number of beds as evident from the Report. It shows an intensely complex picture where the infrastructural pattern shows a less promising trend developing at a very slow pace.

Treatment in the three Kolkata based Ayurvedic hospitals: 1970-1990

The present paper focuses on the Kolkata based three Ayurvedic hospitals namely, J.B. Roy State Ayurvedic College and Hospital (1916), Institute of Post-Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (S.V.S.P) (1921) and Vishwanath Ayurved Mahavidyalaya and Hospital (VAM) (1932) and searches into its history related to the kinds of diseases and its treatment methodology in the time period 1970-2010. The college cum hospital from the time of its inception dealt in speciality departments namely-Kayachikitsa (Internal Medicine), Kaumar Bhritya (Pediatrics), Graha Chikitsa (Psychiatry), Shalakya (Eye and ENT), Shalya Tantra (Surgery), Agad Tantra (Toxicology), Rasayana (Geriatrics) and Vajikarna (Science of virility). Later it included Prasuti-Tantra (Obstetrics and Gynecology), Swasth-Vritta (Social and Preventive Medicine), Kshar-Karma (Para-surgical procedure). All of these hospitals have Indoor patient (IPD) and Outdoor patient department (OPD) treating various kinds of diseases like itches, scabies, corns, eczema, inflamed tongue, ulcer tongue, rabies, sprain, syphilis, ulcer (vagina), pain in joints, filarial, bleeding gums, conjunctivitis, cataract, glaucoma, carbuncle, hernia, acid peptic disorder, lumbar spondylitis, geriatric disorder, habitual constipation, chronic bronchitis, diabetes and rheumatoid arthritis. Even dislocation of the elbow and treatment of fractures has been categorically mentioned.[22] An available hospital record at S.V.S.P reports that as early as in 1927 the hospital's outdoor section treated 7,447 patients and 1,338 surgical cases and in the indoor section 57 medical cases were treated. In 1940's the OPD increased to 16,056 patients in the medical segment, 2556 in the ENT and 473 in the eye department and 887 in the indoor medical segment. In the 1960's there was a tremendous upsurge in the medical outdoor where the number rose to 48,302 of which 9778 visited the eye department.[23] After such a steady growth it is observed from the hospital records that in 1998 a decrease in the number of OPD patients occurred (19,649) which again doubled in 2007 (33,776) and by 2011 the number rose to 43,242. The available records from the gynecology department of J.B. Roy from 1979-83 shows that caesarian cases were dealt which

increased from 539 to 710 in between these years.[24] Apart from this, the present day available hospital records points out from 2000-2007 there has been a gradual increase in the patients in the OPD section of J. B. Roy from 4277 to 6438 in the Kaya-Chikitsa department and on the other hand VAM records 4770 OPD in 2010 to 11,445 in 2011.[25] VAM also provides surgery for piles and fissures in the Kshar-sutra Unit. It is clear from the hospital records that patients visit the kaya-chikitsa, ENT and the kshar-sutra department for treatment. In these hospitals the impact of research is such that it remains confined within the treatment of the patients which are published in several medical journals that have public access through the website.

However, it is observed that the three Ayurvedic College cum Hospitals neither have any well preserved documents about the history of the colleges neither the OPD nor IPD records over the years. Whatever scanty hospital records are available are in extremely poor condition. However, from 2010 onwards the records are documented and preserved digitally as a project of AYUSH to understand and observe the trend of the popularity and social acceptability of Ayurveda.

Hospital treatment-1991-2011

In the latter time period from 1991-2011, certain changes in the treatment method of the hospitals could be observed. In other words, technological advancements were introduced in the form of new machines for pathological tests in the hospitals. This paved the way towards modernization of the traditional medical system in the present day scenario. The hospital introduced Ultra Sonography Unit (U.S.G), X-ray Unit, ECG Unit, Eye-Testing Unit. The syllabus and course structure remained the same since the establishment of the Central Council of Indian Medicine (CCIM) in 1970 till today. Initially Ayurveda was divided into eight distinct specialities-Kayachikitsa (Internal Medicine), Kaumar Bhritya (Pediatrics), Graha Chikitsa (Psychiatry), Shalakya(Eye and ENT), Shalya Tantra (Surgery), Agad Tantra(Toxicology), Rasayana(Geriatrics) and Vajikarna(Science of virility).[26] In the later years, modifications have been made and the number of subject specialties has been raised to twenty-two as per the

report of AYUSH. It now includes Ayurved Siddhanta (Fundamentals of Ayurveda), Rachna Sharira (Anatomy), Kriya Sharira (Physiology), Dravyaguna Vijnan (Materia Medica and Pharmacology), Rasashastra (Pharmaceuticals using minerals and metals), Prasuti-Tantra (Obstetrics and Gynaecology), Swasth-Vritta (Social and Preventive Medicine), Rog Nidan and Vikriti Vijnan (Pathology), Kshar Karma (Para-Surgical procedure), Sangyaharana (Anaesthesiology) and Vikiran Vigyan (Radiology). The Report states that during the recent years, Kshar Sutra and Pancakarma have become very popular among the public.[27] In 1996, at Shyamadas Vaidya Shastrapith three other departments, apart from Kayachikitsa, were opened by the Government of India. They were Dravyaguna Vijnan, Roga Nidana & Vikriti Vijnan and Sharir Samhita for the Post Graduate courses in the institution. The Regulations of the CCIM Amendment Regulation, 2005, stated that the degree conferred to the passed out Post-Graduate students to be Ayurved Vachaspati M.D (Ayurveda).[28] However, M.S. Baghel points out the most practical problem in the present day scenario regarding Ayurveda that its syllabus has not altered since 1971 and also the textbooks have not incorporated new researches in the area.[29] S.V.S.P maintains the Museum of Sharir Samhita (Sharir Rachna), Museum of Roga Nidan and Vikriti Vignan, Museum of Dravyaguna Vijnan. Unfortunately, none of the museums are open for public viewing. The Institute of Post Graduate Ayurvedic Education & Research also maintains an Animal House registered by Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) for doing pharmacological evaluation of the drug on animals by using instruments. S.V.S.P also regularized the Dravyaguna Laboratory for chemical analysis and Dravyaguna Instrument rooms for quality control and standardization of drugs by using sophisticated instruments. As per the recommendations of the Committees, herbal garden has been established and well maintained at the college premise including more than sixty plants. The extension part of the herbal garden is situated in front of the Swasthya Bhavan premise included more than eighty plant species for identification. Another extension part of the herbal garden at the Eco-Tourism Park, Kolkata has one hundred and fifteen types of species

of medicinal plants[30] J.B. Roy Ayurvedic College and Hospital also maintained its own pharmacy, herbal garden, USG Unit, X-ray unit. However, Vishwanath Ayurved Mahavidyalaya and Hospital though has its own pharmacy but the patients are referred to Shyamadas Vaidya Shastra Pith for pathological examinations.[31] All the three hospitals have Kshar Sutra (Ano-Rectal) Unit, conducting surgery related to piles and fissure. In 2002, The West Bengal University of Health Sciences, Kolkata was established under the 'West Bengal Act. XIII of 2002' passed by the West Bengal Legislature, Extraordinary vide notification no.1254-L. The University has also been included in the list of Universities maintained by the University Grants Commission-u/s 2(f) of the U.G.C Act 1956. From 2003, the University took up the responsibility of undergraduate, post-graduate, post-doctoral courses including Ph.D programme in Modern System of Medicine, Homeopathic, Ayurvedic, Unani system of medicine, Nursing, Pharmacy, Dental education, Physiotherapy, Speech Therapy and Education and other paramedical courses in the state of West Bengal.[32] The role of the West Bengal University of Health Sciences is limited only in conferring degrees and follows the course structure as per the guidelines of the Central Council of Indian Medicine.

State-wise distribution of funds under centrally sponsored scheme 'hospitals and dispensaries' AYUSH Report shows Rupees 1737.06 lakhs were distributed for improvement of infrastructures from 2002-2011 whereas Rajasthan amounts to 15692.66 and for institutional development Rupees 802.65 lakhs. For National Mission for Medicinal Plants from 2008-11 shows distribution of funds up to 792.14 lakhs. However, in the AYUSH Report on the number of OPD patients visiting government hospitals during the year under study, West Bengal has not reported any data regarding the number of patients.[33]

The statistical data of OPD section of the Institute of Post Graduate Ayurvedic Education and Research, S.V.S.P, Kolkata shows that in 1998 the numerical strength of the OPD patients were 19,649 which within ten years was almost doubled to 33,776 in 2007. In 2011, the number of OPD patients rose to 43,242 showing a gradual increase in the Ayurvedic system. On the other hand, in J. B. Roy Ayurvedic Medical College the record shows that in 2001, the OPD patients attending ENT section

were 3093 which rose to 4093 in 2003. The Kayachikitsa OPD showed 4277 patients in 2007 which in 2008 increased to 6438 and again in 2009 there was a sharp fall to 3389. On the other hand, Vishwanath Ayurved Mahavidyalaya and Hospital provides the numerological data of OPD and the IPD sections only for the year 2010 and 2011 due to renovation of the Hospital no records of OPD could be found before the month of July 2010 as per the information provided by the Hospital Administration. As per its records in 2010 the total number of OPD patients was 4770 which in 2011 increased to 11,445.[34] As per the availability of the IPD records of VAM it is observed that the hospital has accommodation of twenty free beds. The total number of patients admitted for the year 2010 (July-November) accounted to twenty-two for treatment of Acid Peptic disorder, Habitual Constipation, Chronic Bronchitis, Spinal Canal Stenosis, Hemi paresis, Lumbar spondylitis, Rheumatoid arthritis, Geriatric disorder, Sandhivata, Shandhigata Vata. The Hospital also has a Kshar Sutra Unit where minor surgery on piles is conducted on regular basis. However, the IPD facility is not in the working condition since 2011 due to renovation as informed by the Hospital Administration.[35]

It is also observed that the three Ayurvedic College cum Hospitals neither have any documents about the history of the college nor the OPD and IPD records preserved over the years. Whatever hospital records are available up till 2009 are kept in extremely poor condition and some of the records have no trace at all. However, from 2010 onwards the hospital authorities are trying to document and preserve the records digitally as a project of AYUSH to understand and observe the growing demand for Ayurveda. The task undertaken by AYUSH was mainly to monitor the state-wise administration of the hospitals and to generate the statistical data regarding the improvement in Ayurveda throughout the country for public viewing. It is here we might trace how governmental policies are bringing Ayurveda within the purview of regulations and documenting the social outreaches of Ayurveda.

Medicines prepared in the hospitals for patients

It is observed that all the three Institutions cum Hospitals in West Bengal prepared medicines for the indoor supply only and not for any

kind of commercial sale. The list provides preparation of churna, bhasma, taila, vati and capsule which is very much indicative so as to understand the nature of diseases the patients come for treatment. It includes names as follows — Arjuna Cup, Banga Bhasma, Chittak Haritaki, Harida Capsule, Gandhak Rasayana, Manjishtha Cup, Mahathikthaka Grita, Mahavatavidhangsa Ras, Mesnashringi Cup, Nityananda Ras, Rasaparpati, Rasayana Cup, Shunt churna, Suddha Guggul Capsule, Swetari Ras, Sweatparpati, Til Taila, Trikatu Churna, Trivitlehya Lehya, Vatgajankush Ras, Vyoshadi Vati for treatment purpose. All these medicines are said to be prepared by means of classic Ayurvedic formulations. Vishwanath Ayurvedic Mahavidyalaya also provides a list of medicine prepared in its pharmacy. It includes Hingwastak Churna for colic problems, Yogaraj Guggul, Mahamas Taila for arthritis, Naradiya Lakshmi Bilas for severe pain, Brihat Samdhabadi Taila for rheumatoid, Mahanarayan Taila for joint pain and arthritis, Arshakuthar Rasa for piles, Arogyabardhani Bati for physical weakness, Mahamarichadi Taila for skin diseases and scabies, Chandraprova Tablet for urine related diseases, Tulsadi Churna for cold and cough, Chandramrita for fever and cold, cough, Kanchanar Guggul for joint pain, arthritis, Abhipattikar churna for digestion, Kutaja Ganbati for dysentery, Triphala Churna for digestion, purgative, Swarpagandha Churna for diabetes and to stabilize blood pressure, Neembadi for skin disease, Madhugandha for physical weakness, Kari Bhasma for colic problems, Shankha Bhasma for skin disease, Sohaga for skin problems, Kurchi Bel for dysentery, Tryodosanga Guggul for joint pain, Birechan for constipation, Chatusama for digestion, Brhat Bat Chintamoni for arthritis. Gandhakadi Malam for treatment of boils of any kind, Sringad for cold and cough, Swarpagandha churna to stabilize blood pressure, Phaladikrita Kwath Churna for insomnia, Ashok Louha for leukemia, Yastimadhu Churna for cold and cough.[36]

However, apart from the hospital related pharmacies providing medicines for out-door and in-door patients there are also branded Ayurvedic pharmaceuticals and manufacturers selling over-the-counter medicines. It is observed that the consumers of Ayurvedic medicines often ask for medicines for diabetes, oil for arthritis, sexual problem

related medicines and other health related common chronic problems and tonics. They readily accept these medicines without any prescription and without any hesitation. Moreover, advertisements of the branded Ayurvedic companies thrust on the safe usage of herbal medicines and selling of the concept of returning back to nature in the age of heavy pollution has altered the way to think in new ways, creating a new dynamic approach to reorient the way towards Ayurvedic medicines. Over-the counter drugs have increased the market value of Ayurvedic products but in effect has reduced the practical application of Ayurveda on one hand and validity of personalized patient-doctor encounters in hospitals and clinics on the other.

However, some studies have been conducted on the patient –doctor dialogue from the perspective of understanding the difference of the traditional approach in comparison to the western system. In a study based on a video of consultations in ayurvedic medical practices, the doctor-patient relationship has been put forward by D.von Schmadel and B. Hochkirchen.[37] They opine that in the ayurvedic system the doctor has a much dominating position and the patient is expected to be obedient and grateful to the doctor. They identified four phases of consultation between the doctor-patient while undergoing a treatment which included the psycho-social phase, the diagnostic phase, information phase and the counsel phase. It is the last phase that the Ayurvedic doctor showed expertise of his knowledge. Another study on patient – doctor response has been put forward by Roy Porter with an entirely different perspective. It reveals that 'the history of healing is par excellence the history of the doctors'[38]. Porter's approach was entirely different as it was based on studying the patient history. Porter begins by questioning the basic concept of the sufferer's role in history of healing. But at the same time warns the reader neither 'to dilute the patient's suffering nor to sentimentalize it so much that suffering is beautiful'. Writing about the patient history, he opined that there are sets of patients some being articulate about their sufferings and some are either shy and ends up with yes and no. He also points that self-diagnosing, self-medication, search for cost-effective and affordable treatments by the patients and also visit to non-expertise doctors practiced by more or less every sufferer is a common trait of the patient.

Survey of visiting patients for treatment

In order to understand the sphere of Ayurvedic practices, its growth, reception among the people, the clientele pattern and the usefulness of Ayurveda on arthritis and diabetes we underwent face to face oral interviews with the patients who visited the Kolkata based three Ayurvedic Hospitals. Sixty OPD patients within the age group 20-70 were interviewed following a set of ten questions based on regularity towards Ayurvedic treatment, kind of diseases, social awareness and infrastructure of the hospital. Finally an interpretation and evaluation of the data was done.

It is analyzed from the questionnaire that on the basis of regularity of the patients nearly 81.4% patients visited the Ayurvedic OPD hospitals multiple times within six months. The remaining 18.6% were undergoing the treatment for the first time in the Ayurvedic hospitals.

Regarding treatment of diseases, it is found nearly 70% of the patient come for treatment in arthritis and diabetes and 30% for other diseases related to cold, cough, fever, boils, sexual problems, gynecology.

Regarding social awareness, it is analyzed that 64.28% of the patients are not motivated by advertisements to undergo Ayurvedic treatment rather through personal contacts and those undergoing the treatment. Some also opine that Ayurveda is a common household name, a 'natural' treatment for common ailments, cuts and wounds and having a positive effect. On the other hand, 35.72% opined that media played a role in choosing Ayurveda as a treatment method. Of these 14.3% do not believe in the efficacy of the Ayurvedic treatment but since allopathic treatment failed them to recover from arthritis, diabetes, chronic stomach problem that they have restored to Ayurveda. The remaining 21.4% motivated by advertisements were unsure about the efficacy of the Ayurvedic medicines opined that if their diseases could be cured then how it can be questioned.

Regarding the infrastructure provided in the hospital 100% of the patients are satisfied with the free service provided related to USG, ECG, X-Ray and eye check-up but expressed dissatisfaction as these services are not provided everyday rather on particular days. They also reported that if pathological tests - blood, urine and stool tests were also conducted

within the hospital premise then it would have been beneficial as to perform these tests outside the hospital costs them hugely.

It is summarized from the above analysis that majority of the OPD patients visit the hospital for a regular purpose to cure non-fatal chronic diseases. It is observed that majority of the OPD belong to the middle class hence the free pathological tests and the subsidized fee is affordable for them. They are aware that Ayurvedic and other alternative medical treatments are time consuming yet they prefer the former for relief from painful conditions in case of arthritis or colic pain. It is however evident that from the social history orbit the social requirement creates the need for the space for Ayurveda. Whether this space is a psychological construct or a real situation is a matter of subjective interpretation but the fact that patients opt for an alternative medical system for treatment of different diseases is the matter of interpretation at this juncture. It could be summarized that in the phase of globalization the traditional parampara based Ayurvedic medical practice has entered the path of technological development. The patients have to undergo pathological test for detection of diseases. The age-old practice has acquired a new look with the introduction of dress-code, using of gloves to maintain hygiene, use of X-ray machine, USG, ECG machine hence indicating an interdisciplinary approach towards traditional medical practice as a result of globalization. However, Manasi Tirodkar[39] interestingly points out that the reason behind consumption and utilization of Ayurvedic medicines by the urban Indians is a matter of 'cultural forgetting' of the traditional practice which is again revived by 'cultural remembering' in the age of globalization through different approaches towards health care practices and also its effect in the treatment area.

However, another very pertinent issue that arises out of the interviews is that Ayurveda has entered a phase of new orientation and its global encounter has provided a new identity where it is not confined to just treatment but a holistic approach towards life. But in this shifting paradigm it becomes prominent that the New Age Ayurveda is creating an urban clientele group who are more concerned with beauty salons, beauty treatment, spa-culture and cosmeceuticals. On the other hand,

those who visit the hospital for treatments belong to a completely different world distanced from the above mentioned practices. The 'New Age Ayurveda' with an associated outlet/rider providing the scope for self-medication has become a prevalent factor as also found from our survey reports. A class of consumers has appeared on the scene who do not visit the Ayurvedic practitioners but consume medicines on the basis of the advertisements of the pharmaceutical companies. Thus Ayurveda may mean several things to these different groups of consumers/patients to whom Ayurveda projects entirely different connotations. Although the main thrust of the article is on the scene of hospital and institutional treatment and research, yet the great significance of the availability of alternative medicine cannot be truly perceived without reference to this wider scene of lived experience.

Research in the field of Ayurveda

In the recent years, research in Ayurveda has been the prime need owing to its development in the area of scientific progress, validation of the drugs prepared from herbal plants, quality control, standardization and drug testing. Current trends in research reveals an orientation in scientific analyses of known and new herbs in Ayurveda, validated as per the WHO and Government rules and patented to some extent. However, a group of scholars and researchers have interrogated the new approach for laboratory research in Ayurveda. In Ayurveda the process of 'reverse pharmacology' has been in vogue that followed the path of 'clinics to laboratories' as pointed by Bhushan Patwardhan.[40] In the treatment area clinical tests are conducted to prove the authenticity of the medicines and established the perfection for cure of diseases. R.H.Singh [41]points out that research in therapeutics in Ayurveda is the need of the hour. He suggests that the method of reverse pharmacology is more important than setting for drug evaluation and emphasizes on Ayurvedic treatment within tridosha diagnosis and pulse examination. He further points out that pre-clinical trial is not necessary in the traditional system of medicine as the medicines have not proved to be harmful in the specified conditions of use in the past. However, Bhushan Patwardhan[42] directing towards reverse pharmacology opts for pre-clinical trials for

validating drug safety resulting from new procedures or extractions and also for some human diseases like diabetes, arthritis and asthma. Mention must be made of M.S. Valiathan[43] and his team who have started science initiatives in Ayurveda on a different research methodology exploring the fundamentals of Ayurveda which includes fundamental principles like Prakriti, Oja, Bala and Rasayana, hence preventing to fall an easy prey in the hands of herbal research.

Several research articles published on the treatment methods, clinical tests on arthritis and diabetes in West Bengal and in India owing to the fact that majority of the patients undergo Ayurvedic treatment on these diseases. In the hospital treatments the impact of research is such that it remains confined within the treatment of the patients. On the other hand, research in Ayurveda has been the prime need owing to its development in the area of scientific progress, validation, standardization and drug testing. Research is conducted to combat diabetes, the worldwide phenomena, therapeutically through Rasausadhies[44]. The pressing issue of diabetes has been under systematic study and assessed in the clinical study regarding the safety and efficacy of Ayurvedic medicines.[45] Researchers are also assessing the role of Ayurvedic 'bhasmas' to view the clinical effect of these bhasmas in treatment of various diseases.[46] Apart from these researches on Ayurvedic medicine for rheumatoid arthritis has been under study.[47] Clinical trials of Rumalaya tablets and cream for frozen shoulders,[48] also clinical trial of Inolter, a herbal product, for Type-II diabetes Mellitus on patients have been reported and studied.[49] Interestingly there has been a thorough study on the identification of inflammatory arthritis by the Ayurvedic practitioners.[50] In the very recent years however, clinical study on Guduchi Sattava for Diabetes Milletus Type-II[51] to the patients coming for treatment in Ayurveda also have been documented.[52] Apart from this, concern and awareness for amvata or arthritis has also been the pressing issue of the time. Rheumatology care in West Bengal[53] and also the Himalaya Drug Company published research papers on their tablets (Rumalaya) for arthritis.[54] Case studies have been conducted to manage Amavata through diet, Virechanakarma (therapeutic purgation), medication in IPGTR&A Gujarat, Jamnagar that records remarkable

symptomatic relief for the patients.[55] Similarly in another study conducted in the Ayurvedic Trust, Coimbatore, India, to indicate and analyze the efficacy and safety of Ayurvedic treatment of RA sponsored by the World Health Organization indicated effectiveness for those who completed the treatment.[56] The other disease diabetes, commonly known as Madhumeha in Ayurveda, is another pressing problem of the present time and patients opt for Ayurvedic medications to prevent side effects of the modern medicine.[57] Hence it became necessary clinically to determine the safety and efficacy of these medications owing to the well-being of those who prefer to opt for Ayurvedic treatment for such non-fatal, chronic, non-communicable diseases.

Phases of clinical trial for Ayurvedic, Siddha and Unani (ASU) drug/ patents or proprietary medicines has been proposed to be included well-structured protocols which clearly state the background, objectives, rationale, design, methodology, and considerations of the study as per authentic descriptions mentioned in Ayurvedic classics. It suggests four phases of study that encompasses -Phase I (human pharmacology), Phase II (therapeutic exploratory trials), Phase III (therapeutic confirmatory trials), and Phase IV (post-marketing trials). Diseases having high incidence are naturally preferred in clinical research. However, epidemiological data with regards to diseases described in Ayurvedic classics (e.g., incidence of *Grahani*, *Prameha*, *Raktapitta*, *Amavata,* etc.) is not generated though we have such data for diseases described in modern medicine, e.g., diabetes, arthritis, cancer, etc. Framework for documentation of epidemiological data of diseases described in Ayurveda should be developed to strengthen Ayurvedic clinical research.[58] He points out that the component of *Samprapti* (pathogenesis) and its alleviation must be well explained from the stand point of Ayurveda as M. S. Valiathan pointed out in order to authenticate the clinical research as Ayurvedic clinical research.

It is carried out that while planning clinical trials on *Madhumeha*, one should conduct physical examination of patient's urine to exclude *Kaphaja* and *Pittaja-meha* in addition to diagnostic criteria based on

symptoms of diabetes mellitus. The standard rule for such investigation for assessing the involved *Dosha* and a proper analysis of other symptoms such as *Dantadi Maladhyata* (excessive deposition/ accumulation of *Malas* on teeth and other orifices), *Karapadadaha* (burning sensation of hands and legs) should be carried out to categorize the prognosis of the disease. Examination of Varna (colour), Rasa (taste), Sparsha (touch), and Gandha (smell) of Mutra must be carried out to diagnose subtypes of *Prameha*, though it appears to be a very crude method of assessment, but yet very important criterion for establishing diagnosis according to guidelines of Ayurvedic classics[59]

Similarly, in the clinical trials on *Amavata*, the assessment criteria[60] of American College of Rheumatology are considered in the protocol without incorporating the diagnostic criteria based on Ayurvedic descriptions. Such studies required inclusion of joint condition with symptoms such as Angamarda or body ache, thirst, laziness, fever should be studied in order to understand the condition of the patient irrespective of modern diagnosis to prove the efficacy of the drug in *Amavata* as suggested in Ayurvedic literature. The study proposes that exclusion criteria must include *Vatarakta*, *Sandhivata*, *Kroshtukashirsha* which are interpreted as different varieties of arthritis or musculoskeletal diseases. Hence as H.R.Singh points out that clinical research must follow the path on Ayurvedic lines then only both the research and the treatment method can go hand in hand in the traditional system making the system more effective.

However, in the present day the area of Ayurvedic research is based on modern technological advancements to validate scientism in Ayurveda. The subject of research is not only confined to non-fatal chronic diseases but also extending its search solutions for deadly diseases. Evidence based validation of herbal plants and medicines have tried to link phytochemistry and traditional medicine with a close collaboration between pharmacology, toxicology, natural products and chemistry. These clinical trials need proper publicity to prove its journey towards a betterment and holistic approach towards mankind. Moreover,

lacuna in the peer-reviewed journals of the Ayurvedic researches needs to be looked into.

The kaleidoscopic picture of the medical treatment and health through Ayurveda in the Kolkata based three Ayurvedic hospitals as has been viewed gives a clear idea that implementations of the national and international policy regulations in the form of upgradation of institutions, introduction of modern equipments, registration of Ayurvedic doctors, maintaining a standard formulary, quality control through Good Manufacturing Practice, Good Laboratory practice have been brought into the picture. Yet the state of West Bengal lacks the efficiency as already noted in the AYUSH Report where the infrastructural set up of the Ayurvedic hospitals with its number of beds and apparently no increase in number of educational institution shows a bleak picture. But even in such a dark scenario the social acceptability towards Ayurveda is gradually gaining ground. Research articles published on different diseases separately and conducting experiments to find means and ways to treat diseases is something to look forward to. The patient community and their belief that Ayurveda is a safe treatment methodology for non-fatal chronic diseases are getting a strong foothold.

On the regulatory side the WHO regulation of GMP certification in all Ayurvedic drugs created awareness among the mass about the quality of drugs, which also indicates patients taking recourse to Ayurvedic treatment. The clinical research provides an opportunity to enrich the treatment area and situates Ayurveda with a new orientation. In the treatment area the applicability of research remains confined to patients only whereas the overall market for researched drugs remains open and wide. Moreover, the research and development wing of the private pharmaceutical companies are propagating their research developments and standardization of medicines, health tonics which motivate the consumers to purchase medicines randomly. However, at this juncture more and more research is required on plant validation and its impact on diseases which will not only enrich the formal treatment area and also pave the way for its popularity.

Notes

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Medical History: British India, the Dutch Indies and Beyond

Deepak Kumar

The seminar at the Asiatic Society (Feb. 2019) aimed at exploring history of medicine in India and beyond. Here the term 'beyond' is significant. It probably hints at the desirability and possibilities of comparison. India is not a lone tropical country. Its climate, topography, diseases, and health issues are similar to several Indian Ocean countries. As diseases know no boundaries, similarities are more than dissimilarities. The latter are to be found more in the way health issues were handled by different governments and societies on different occasions. As these countries fell to different colonizing nations, the health policies and responses were naturally different and varied. Both Indonesia and India were conquered by trading companies, the Dutch VOC (Verenigde Oostindische Compagny) and the English EIC (East India Company) respectively. A comparative study can help see a bigger picture. Did they collaborate or learn from each other? Colonisation was more a process than a monolith. There were so many different strands and variations. Dutch colonization was different from the British. But their objectives were similar. Both were after all East India Companies! The takeover by their respective governments meant even more consolidation.

Modern medicine reached distant shores riding the colonial wave. During the seventeenth and eighteenth centuries, almost every ship that sailed under the East India companies had a medical man on board.[1] They were products of scientific institutions and represented an emerging cosmopolitan medical system which stressed scientific causality. Naturally they looked at the local health conditions and the local medical traditions with disdain and they appeared like 'tools of

empire'. The colonial medical discourse is no doubt a 'discourse of power' but it also has elements of insecurity, curiosity, amazement and frustration. Its history cannot simply be written in black and white. To dismiss the colonial doctors reductively as the handmaidens of colonialism or capitalism would also be to ignore a more complex, and more interesting reality.[2] The doctors had to assume multiple roles. They had little choice. Still one can ask, what role did the 'peripherals' play? Could a synergetic relationship between the core and the periphery develop? These questions assume special significance when viewed against the four centuries of European's struggles in the 'torrid zones' and their transition from early explorers, travellers, and traders to conquerors and ultimate arbiters of the trampled tropics. Profit, however, remained the main motive during all these trials and turbulations. The Dutch colonizers were comparatively harsh. In fact, there were some English publicists who wanted the British to ape the Dutch methods, especially after the Revolt of 1857. Citing the example of the Dutch in Java, an English barrister wrote two volumes on how to manage a colony.[3] Some recent revisionist works no longer treat empires as 'colossal juggernauts razing everything in their path' and uncontested by indigenous interests. Rather they view it as 'webs, fragile and prone to crisis.'[4] Earlier the 'tropical discourse' was viewed through its pioneers; now issues and dichotomies have been given primacy.[5]

The Medical Episteme

Interestingly, the medical episteme of both the colonial and local practitioners were almost similar. The Galenic dealt with four humors, the Ayurveda with three and the Chinese medicine had six. Though the medico-religious side of the Asian medical practices, such as incantations and amulets, attracted Western derision, there did occur close interactions. The early Jesuit writers in Goa characterized the *vaidyas* as the Goa Brahmins who were gifted with keen intellect and cured 'with simple remedies unlike European physicians'. The descriptions of Indian medical practitioners and their treatment of patients in the Portuguese texts reveal that Portuguese medical

practitioners had tried to understand the working of the Indian medical traditions in great details.[6] In the Dutch Indies it did not happen. However, with the passage of time, the assimilationist approach gave way to one of conflict, leading to obstacles in the flow of ideas.

But at least in South Asia, there did occur a give and take. In South Asia the traditional healers had learned bleeding and phelebotomy from the Europeans, while the latter borrowed rhinoplasty from India. In East Asia (if not in the Dutch Indies), the Europeans learnt moxibustion and acupuncture whereas the Asians received modern anatomy, surgery and hospitals. The two had similar magical/humoral pasts, but Western medicine moved towards specialty and 'superiority' with the discoveries of Vesalius and Harvey. The ultimate separation was accomplished by the germ theory of disease in the 1880s. Until then the Europeans believed in 'invisible miasmata' as causing diseases whereas the Asian healers held 'evil spirits' and *tridosa* (humoral imbalance) responsible. It was the microscope which could finally drive away both the invisible spirits and the invisible miasmas. But in the process any possibility of a 'syncretic' medicine was lost.

The discourse of empire was not singular. The European imperial powers had differences of their own and they created different politico-economic structures in different empires guided by its distinct topography and resources, etc. Even the response they elicited from the local populations differed greatly. Does a history of tropical medicine fit into this framework? Probably not, as diseases travelled across empires and did not vary according to different colonial contexts. The tension, as Worboys points out, had its roots in the very origins of tropical medicine. Imperial powers had colonial medical policies and services but their officers were trained in tropical medicine. It is quite possible that they produced distinct forms of tropical medicine and even different understanding of the different diseases themselves. They concentrated on what they considered 'exotic' diseases (mostly epidemics) and this probably masked the real disease problems of the colonized peoples. The remedy was sought through preventive measures. The therapeutic measures like vaccines

were conditioned by different local and racial assumptions. The main determinant was neither the tropical environment nor the disease *per se*, but colonialism itself.[7]

Organisational Structures

In both colonies western medical practitioners came through the army and their main concern naturally was the health of their respective armies. In India a Medical Board governed them since 1773 under a cadre called Indian Medical Service (IMS). It served the Company well through its military operations and turbulations. In addition, they participated in different explorations within the colony as surveyors, botanists, geologists, ethnographers and many other ways. They were called surgeon-naturalists and were explorers par excellence. Dalhousie tried to take the IMS under direct control and in 1857 the Board was abolished and the Service was placed under Director General and later Surgeon General. The Army had its own Army Medical Department (AMD) as well. There was some tension between the IMS and AMD but the former was numerically large and qualitatively strong. They worked in different capacities like professors in medical schools/colleges, sanitary commissioners, chemical analysts, and also as heads of botanical and geological services. In 1895 the editor of the British Medical Journal wrote; 'It is a bizarre and stereotyped system…in which the IMS man seems to be expected by Government to fit for any post that may be vacant…'[8] In the same year Joseph Chamberlain as Secretary of State for the Colonies, initiated several programmes which radically altered the British Government's traditional policies in and for its tropical colonies. He proposed that the Government should be active in promoting the 'exploitation' of the vast 'underdeveloped estates' - this policy he called 'constructive imperialism'. But the Indians had very little scope in this service. So by the turn of the century Indian doctors demanded 'a separation, complete and absolute, of the civil from military medical service.' This could be granted only in 1919 as part of the Montagu-Chelmsford Reforms in the midst of the vociferous demands for the Indianisation of the medical services.

The Dutch also depended on the military medical service. But they were less organized. The Napoleanic wars had disrupted their control and command in the Indian Ocean. They had lost Ceylon and East Indies to the British but regained the latter in 1816. A Dutch professor of Botany (Reinwardt) was sent to organize the medical services. Instead of a single medical service, he created three separate services: 1. military medical service, 2. civil medical service, 3. a service for vaccination. But as expected, the military service dominated and subsumed the others. But there some outstanding individuals with a social conscience like Dr. Bosch who argued that the epidemics afflicting the native population of Java were the result of poverty and undernourishment. In the late 1840s he established vaccination centres in such a way that no one was more than seven kilometers away from the centre. This is exactly how a vaccine-pioneer Haffkine argued in India in the 1890s.[9] In the Dutch King's speech of 1901 a new colonial policy was mentioned that came to be known as the 'Ethical Policy'. This was probably the Dutch equivalent for Chamberlain's 'constructive imperialism'. One of the characteristics of that policy was an extension of colonial power over the outer provinces. 'The breakthrough in the medical care for civilians in the Dutch East Indies came only after the arrival of the private entrepreneurs who founded factories and estates with private capital'.[10] This system probably provided better health care to the local workers than the plantations and estates in India. Privately run plantation economy initiated and pushed hospitals and medical education, while in British India it largely came through the army and its wings like AMD and IMS. Unlike their oppressive Indian counterparts, the plantation owners in the East Indies fancied themselves as 'welfare capitalists'.

Different Cultures

The above-mentioned structures were determined by the colonial parameters, but these did not function in vacuum. Local traditions and cultures had to be taken into account and these in turn were impacted by the new discourse. Unlike Indonesia, India had a fairly

strong medical tradition which had served the society for centuries. It was a living tradition and every generation wrote commentaries on the venerated medical texts allowing some additions and enrichment.[11] The numerous European travellers noted these with varying degrees of both amazement and disgust. They were appalled at the sanitary conditions but the treatment (*nidan*) and the *bazaar* medicines surprised them. To import medicines from Europe would have been too expensive for the trading companies. So, the local knowledge was sought. Even among the British officials there were some who wanted the government to attempt a fusion of both 'exotic principles and local practices, European theory and Indian experience', and thereby 'revive, invigorate, enlighten and liberalise the native medical profession in the mofussil.'[12] Similar views were echoed by the emerging Indian middle class. Syncretism, not revivalism, was the agenda.

In the Dutch Indies, the indigenous populations were usually regarded as barbaric or depraved and little or no attempt was made to understand, much less appreciate, the Indonesians' cultural background. Unlike India, change came much later in the twentieth century under the so-called Ethical Policy, like the Swadeshi movement in Bengal, it marked the beginning of national awakening. It was nonetheless advocated first by van Deventer, a lawyer, in 1901. The great break came in 1908 when a movement called Boedi Oetomo (Noble Endeavour) was started by two physicians, Dr. Soetomo and Dr. Wahidin. Like the Swadeshi movement in Bengal curious situation. The Europeans were willing to admit the worth and relevance of indigenous institutions, but not to the point of forgetting their own antecedents. The Indonesians strove to master Western techniques without making the inherent thought process behind the technique their own.[13] Yet some recognized the time-honored curing devices of the traditional Javanese and Indian health care. The meridians used in acupuncture are real links in the nervous system and the main *cakra* (energy centres) along the *susumna* (spinal columns) in Yoga theory do correspond to the main glands of the body.[14]

Exchange in medical ideas may not have been vigorous, but the early colonial medical men did produce a number of medical-ethnographic, climatological and topographical descriptions. Some of these were of outstanding scientific value, while some reinforced or even created myths about racial and physiological differences. The 'natives' had no means to defend themselves; there was no level field, much less level pegging.[15] On many points the Western and the 'Oriental' world-view were so different. One example from the British Surgeon General in early 1920s :

> During my stay in Madras there was an incident which illustrated a very different outlook on the population question. In addressing the members of the Health League of Madras I urged them to persevere in their efforts to prevent disease, but went on to show that there was another side to the picture; I asked them to think of any village that they knew and to suppose that it was possible to bring back to life everyone who had died of preventable diseases during the previous 30 years; if all these were to return in a procession to take over their former positions and possessions, would they be welcome? The unexpected reply came from the next speaker, a highly respected Hindu gentleman who said, 'How true were the words of our Surgeon General; with what joy we would welcome our dear lost ones!'[16]

Medical Education and Research

One thing that can induce drastic change in any society is education. The colonisers knew that to consolidate their rule and to elicit consent, education would be the most potent tool. They would first use brute power to colonise and then tried to 'civilise' through education. As Kipling wrote,

> They terribly carpet the earth with dead,
> And before their cannon cool,
> They walk unarmed by twos and threes
> To call their living to school.

After two-three decades of dithering, medical education attracted attention in the 1820s. In a sense it was necessary; to import medical men from Europe was very expensive, so the natives had to be trained for lower positions in the medical service. There was internal demand as well. Medical schools were opened in Calcutta, Madras and Bombay which proposed to give a mixture of both western and indigenous medical knowledge. Because of language and other logistic problems the attempt failed. So, a proper medical college on western lines was opened in Calcutta in 1835. It was easy to dangle western models, but when it came to financial investment, the government developed cold feet. The local rich came forward, and a new elite, comprising chiefly the three Hindu upper castes, came forward to take the advantage.[17] Medical education was not only a question of pedagogy and curriculum but also of social mobility. For example, when the Grant Medical College was opened in Bombay in 1845, the government expected a good response. But very few students turned up for admission; the Brahmins refrained probably because the new medical school required them to touch and dissect dead bodies. For several successive years the seats remained vacant, so the principal wrote to the DPI of Bombay asking for permission to admit students from the lower classes (castes). The DPI shot back, never do this. 'The lower classes people once they get this new higher education will earn more when they return to the society and will thereafter demand higher social status. This would upset the social balance. We have come here to rule, not to cause social upheavals,' the DPI rightly warned and made the forecast, 'the Brahmins would come once they see money in modern medicine'.[18] This is exactly what happened. Despite numerous shortcomings of the colonial education, there is no doubt that no branch of education was so successfully attempted and no practical knowledge took more thorough root than the science and practice of western medicine.

For a long time, the Dutch in the Indies depended on their own import of medical men from Europe. It was only in 1851 that a Dokter Djawa School was opened. But its purpose remained unclear for a

long time. Was it only to train vaccinators with some knowledge of medicine, or was it to be a place for training medical practitioners? The curriculum was primitive, the duration of the course was short, and the language was Malay. As an American doctor in Java reported, 'the medical curriculum originates in Holland without the slightest flexibility toward local conditions.'[19] It was only in 1913 that this school could train and produce medical graduates.[20] In striking parallel with British India, the Dutch also excelled in utilizing the divisions in the colonized society to their benefit. To quote Raden Kartini, daughter of a Javanese regent who pioneered women's emancipation and education, 'The Hollanders laugh and make fun of our stupidity, but if we strive for enlightenment, then they assume a defiant attitude toward us.'[21]

While medical education moved on a good pace in the British India, and produced thousands of doctors and hospital assistants, medical research languished. India and Indonesia were large natural disease repositories but their medical services were not geared to meet the task. There were no doubt scientifically trained persons, and most of the early investigations in natural history were made by them. But medical research remained stuck in the climatic and miasmatic explanations. By 1860, the bacteriological advances had set bells ringing if cholera had to be prevented, it had to be sought out, not waited for. A Cholera Commission was set up and sanitary commissions were established in the three presidencies in 1864. In 1883, Robert Koch discovered the cholera 'Comma' bacillus in Egypt and visited Calcutta the same year to confirm the discovery. This helped the theory of disease causation over the earlier miasmatic theories. In 1890 a Leprosy Commission was set up and a bacteriological unit was opened in Poona. In 1896, a Plague Research Laboratory was established under W.M.Haffkine in Bombay. There was at least one original discovery of everlasting value – by Ronald Ross on the relationship between malaria and the mosquito. His guru Patrick Mansion had spent decades in China and had worked on the etiology of elephantoid disease and it was on Mansion's advice that Ross concentrated on mosquito as the

only possible malaria vector.[22] Gradually Ross developed interest in the practical implications of his work, that is, in malaria control by destroying or treating their breeding areas. But this was to involve considerable expenditure and large-scale sanitary measures which no colonial government was willing to undertake.

The Dutch Indies had a similar situation. The discoveries of the causes of traumatic infection, malaria, typhus abdominalis, cholera, pulmonary tuberculosis, amoebic dysentery, diphtheria, and tetanus, all made between the years 1880-1900, created great sensation in the Indies too, and aroused hopes of the possibility of efficient combat.[23] There was, however, one disease which refused to yield – beriberi. Like Ross in India, C. Eijkman had spark of originality. By 1890 he had established a relation between disease occurring in chickens if fed a certain sort of rice and human beriberi. Gradually he noticed that a great difference appeared depending on whether the rice was polished or unpolished. This opened the way for the prevention and rational treatment of beriberi. These were the achievements of tropical medicine and were of importance for the theoretical framework of western medicine. This was also the period when the similarities between the health disorders in the tropics and in Europe were discovered. Between 1882 and 1893, for example, the diagnosis of typhus does not occur in the military sick reports and it was stated that typhus did not exist among the natives. As medical diagnosis improved and better trained doctors were sent to the Indies, they began to recognize more and more western diseases in the tropics. The 'unity' of western and tropical medicine became clear.[24]

Public Health

Public health usually refers to organised efforts made under the direction of medical experts for preventing disease and improving the health of the people. Decades before public health moved public opinion, socio-medical activities had called for strong sanitary measures, even a sanitary despotism.[25] This gave birth to the concept of 'sanitary engineering' which gradually developed to denote

'environmental health' rather than the limited original concept of 'plumbing'.[26] Environmental health included not only water, sewage, refuge, etc. but also equally important subjects like ventilations, lighting, safety, housing, town-planning and rural sanitation. The concept of public health had thus become virtually all-embracing.

Mark Harrison rightly argues that the development of public health in India has to be seen 'in terms of a dynamic matrix of motives and sectional interests within and between European and Indian communities'.[27] But he finds the scope and effectiveness of colonial medical intervention rather 'limited'. Widespread indigenous taboos and suspicions, and the reluctance of the Indian rentier class to pay, precluded the possibility of 'any vigorous programme of sanitary reform'.[28] In such explanations the role of the state gets marginalized. Modern medicine entered India riding the colonial wave and, as a recent critique puts it, colonial medicine did not mean altruism, it meant uncanny imperialism.[29] No wonder, it failed to make the transition from state medicine to public health.[30]

There was a genuine hope that with the spread of education sanitary consciousness would grow which would gradually force the local bodies and provincial governments to act. But this did not happen. As an American doctor reporting on cholera in India in 1890 wrote, 'youth who will recite Shakespeare and Milton and quote Bentham and J.S. Mill, are ignorant of the first principles of their existence, viz. that pure air and pure water are essential to the maintenance of life'.[31] This tradition (of blaming the other) continued well beyond Katherine Mayo![32] A highly influential IMS regretted, 'the people multiply like rabbits and die like flies'.[33] Many sincerely believed that the European sanitary standards were 'simply above the comprehension of the majority of the natives, whether high or low born'.[34] The problem was no doubt real.

To ease its burden, the colonial government looked for private support. The health programmes of the Rockefeller Foundation (RF) came as divine intervention. Its focus was on the plantations in different parts of Asia and Latin America which needed to be made lucrative

through greater scientific input and the control of diseases which impaired the labour productivity. In India, the RF's involvement began with the visit of Dr. V. G. Heiser to Madras in 1915. He looked into the prevalence of hookworm disease and felt enormous amount of work could be done at a comparatively small costs.[35] More work was done by Dr. Kendrick during 1921-34. He developed control of hookworm by means of travelling treatment units and latrine building. He made several important studies on the species of hookworm and the flow of ground water in connection with bored hole latrines.[36] The most important component of this campaign was the emphasis on creating public awareness. This was done through lectures, pamphlets, lantern-shows.[37] The usual government excuse of 'want of funds' was considered lame. One thousand patients could be cured for a trifling sum of Rs. 125/-, it was argued.

In 1916 an American doctor Darlin arrived in Java to study malaria work. The Dutch doctors and administrators were apprehensive and did not like the intrusion. The Americans on their part described the Dutch as 'extremely rude' and 'fat'.[38] J. L. Hydrick arrived as RF representative in Java in 1924 and he also picked hookworm. A Hygiene Mantri School was started where public health specialists educated local midwives and traditional healers (dukun) in the principles of hygiene. Hydrick called for 'intensive rural hygiene work', which was never implemented. In fact, preventive medicine was seldom appreciated by the Dutch doctors. But RF in India helped establish the All India Institute of Hygiene and Public Health. Here the canvas was much larger than that of the Mantri School in Java. RF was highly successful in China. It even claimed that it aroused both in China and India 'a medical-technical consciousness' that they had lacked. Was this true for Indonesia as well?

No reference to the health debates in Indonesia would be complete without a mention of Dr. Raden Soetomo, social reformer, political activist, and medical doctor. In his writings and speeches, he never referred to western ideologues; rather he would quote from Gandhi, Tagore and Vivekanand. He visited India in 1936 and was greatly

disappointed 'because conditions in North India with its poverty and slovenliness'. He also failed to meet his idol, Mahatma Gandhi, and was upset by a 'somewhat rude reception and the neglected and dirty conditions of Gandhi's quarters.'[39] It is interesting to note that while in India the lawyers led the national movement, in Indonesia, Philippines, and Malaysia, the 'native' doctors were on the forefront.

Exploring Sub-themes

Canonical medical texts have so far been a favoured area of attention. In India, for example, the texts of Charaka, Susruta, Madhav and Vagbhatta have been commented upon by many scholars.[40] These need to be contextualized. It is possible to think of and attempt a balance between text and the context, between social constructivism and historical relativism. In the Indian context it is even more important. To achieve this, a sound knowledge of the classical language in which a text is written is necessary. Then this needs to be related to the numerous commentaries that have followed an established text.[41] After all in India knowledge advanced more through commentaries written in different periods than through a canonical text. Their critical assessment would require help from philologists and philosophers. It is a daunting task but nevertheless rewarding. This argument would be equally valid for other Asian societies and cultures as well. The Indians accepted British law without much fuss but not British medicine. The response was basically three-pronged: (a) conformism, (b) defiance, (c) quest for alternatives. Several questions emerged in the debates at both national and local forums. Was indigenous medicine to be patronized because it was found to be 'cheap' and 'popular'? What were the 'pressure groups'? Was there actually a protest against modernization of Indian medicine? Did the voice of 'defiance' end up being a voice on 'defence' of the indigenous system or was it also able to launch a critique of the western medicine at a deeper level? In any case the West loomed large. It was difficult to oppose the West, even more difficult to ignore it.

In all the East Asian societies, rapid post-war development has created sophisticated modern healthcare systems. Yet at the same time

each society has maintained traditions of medical practice stretching back over centuries with a shared Confucian heritage, Daoist medical lore and useful folk wisdom resulting in linked forms of traditional Chinese medicine.[42] In China modern nationalism had two strands, one to destroy the old culture as harmful to the nation, the other to cherish it as the hallmark of the national genius.[43] Apart from the forays into the dichotomies of cultural texts which have enormous relevance for public health debates, there are several other sub-themes which call for attention. How and to what extent medical pluralism is desirable?[44] Acceptance of differing views may on the whole be encouraged, but can one tolerate certain particular approaches like witchcraft or the Nazi medical experiments?[45] During the 1930 (which saw the rise of Fascism in Europe) the local elite in colonized societies talked about development with a kind optimism that elevated the public health concerns to the level of 'human rights', and not just the management of dangerous bodies.[46]

Long ago Thomas McKeown had argued for a sociological approach instead of a linear one. He called for a medical history with 'public interest put in'.[47] In addition history of medicine must take cognizance of issues like gender and health, health and business, drug industry and bioethics, etc. Another area meriting attention is that of chronic diseases and disabilities. We need to move away from excessive obsession with toxicology and pathology and think of occupational health hazards and environmental medicine.[48] Who can forget the Bhopal tragedy of 1984? Industrial technology has probably killed more people than military technology. There are new developments, for example, nanotechnology. These fine tools often play the lead role in the patient's treatment. Instead of the technology being just a tool in the physician's hands, the tool becomes the focus of the care and physician becomes the mechanism by which the tool is applied. The questions of law, technology and ethics here get intertwined.[49] In fact medicine itself emerges as techne, a concept that integrates theoretical and practical aspects and bridges the conceptions of medicines as science and as art.[50] If this could be done with a comparative

perspective, it would be much more rewarding in an increasingly globalising world. We need to learn from both the colonial and post-colonial experiences of South Africa, Egypt, Nigeria, Vietnam, Philippines, Indonesia, Malaysia, and many others.[51] What a canvas and what a feast! I trust the historians would rise to the occasion.

Notes

[1] The National Archive of India (NAI) has enormous collection of the Medical Board files from mid-eighteenth century while the Dutch archive at The Hague numerous records on the Dutch East India Company.

[2] Heather Bell, *Frontiers of Medicine in the Anglo-Egyptian Sudan, 1899-1940,* Oxford, Clarendon Press, 1999, 10.

[3] J.W.B. Money, *Java; How to manage a Colony showing a practical solution to the questions now affecting British India*, London, Hurst & Blackett, 1861.

[4] Tony Ballantyne and Antoinette Burton (eds.), *Bodies in Contact: Rethinking Colonia Encounters in World History*, Durham, Duke University Press, 2005, 1-15.

[5] However, these still abound in metropolitan theorizations and do not include the study of indigenous (non-settler) societies through their own literature and practitioners.

[6] See, M. N. Pearson, *Towards Superiority: European and Indian Medicine, 1500-1700*, Minneapolis, University of Minnesota Press, 1989.

[7] M.Worboys, 'The Emergence of Tropical Medicine', in G.Lemaine, et.al (eds.), *Perspectives on the Emergence of Scientific Disciplines,* The Hague, Mouton & Co., 1976, 75-98.

[8] Papers Relating to the Improvement of the Position and Prospects of Civil Assistant Surgeons in India, 1891-9, *Selections from the Records of GOI*, no. 377, Calcutta,Govt. Press, 1900, 28.

[9] Deepak Kumar, 'Colony under a Microscope: The Life and Works of W. Haffkine', *Science Technology and Society*, vol.4, no.2, 1999, 239-271.

[10] A.H.M.Kerkhoff, 'The Organisation of the Military and Civil Medical Service in the Nineteenth Century', in G.M.van Hetren et.al (eds.) *Dutch Medicine in MalayaArchipelago, 1816-1942*, Amsterdam,Rodopi,1989, 9-24.

[11] For details, see, G.J. Meulenbeld, *A History of Indian Medical Literature*, 5vols. Egbert Forsten, Groningen, 1999-2000. No such exhaustive work is available in the context of Indonesia. Probably the Chinese medical literature would serve the purpose.

[12] W. Adams, *Report on Vernacular Education*, Calcutta, Govt. Press, 1868, 322-23.

[13] See, Van der Knoef, 'Dutch Colonial Policy in Indonesia, 1900-1941, Unpublished Ph.D thesis, University of Michigan, 1980.

[14] Ina Slamet-Velsink, 'Some Reflections on the Sense and Nonsense of Traditional Health Care,' in Peter Boomgaard et.al (eds.), *Health Care in Java: Past and Present*, Leiden, KTLV Press, 1996, 65-80.

[15] Deepak Kumar, 'Unequal Contenders, Uneven Ground: Medical Encounters in British India', in A.Cunningham and B.Andrews (eds.), *Western Medicine as Contested Knowledge*, Manchester, Manchester University Press, 1997, 172-90.

[16] J. D. Megaw, 'India Heading for Disaster', Typescript, n. d., Mss. WA 27984550, Wellcome Institute Library, London.

[17] Anil Kumar describes them as *Brachmannisproximi* and then examines the why, how and to whom questions relating to education in a detailed chapter in his *Medicine and the Raj*, New Delhi, Sage, 1998, 17-87.

[18] Report of the Board of Education, Bombay, 1850-51, 10-15 (Maharastra State Archive).

[19] Han Mesters, 'J. L. Hydrick in the Netherlands Indies: An American view of the Dutch Public Health policies, in Peter Boomgaard, et al (eds), *op. cit*, 1996, 51-62.

[20] D.de Moulin, 'Teaching of Medicine in the Dutch East Indies,' in G.M.van Hetren et al (eds.), *op.cit*, 1989, 25-33.

[21] L.H. Palmier, *Indonesia and the Dutch*, London, Oxford University Press, 1962, 6-7.

[22] Douglas M. Haynes, From the Periphery to the Centre: Patrick Mansion and the Development of Tropical Medicine, 1870-1900, unpublished Ph.D thesis, University of California, Berkeley, 1992.
See also, Shang- Jen Li, British Imperial Medicine in Late Nineteenth Century China and the Early Career of Patrick Mansion, Unpublished Ph.D thesis, Imperial College, University of London, 1999.

[23] For details see, Dirk Schoute, *Occidental Therapeutics in the Netherlands East Indies, 1600-1900*, The Hague, Netherlands Indian Public Health Services, 1937.

[24] A.de Knecht-van Eekelen, 'The Interaction of Western and Tropical Medicine', in G.M. van Hetren, *op.cit*., 1989, 57-71.

[25] J. Cunningham, 'The Public Health in India', *Jr. of the Society of Arts*, XXXVI, Feb. 1888, 241-265.

[26] J.B. Grant, Director, AIIHPH, to DG, IMS, dt. 26.9.39, Rockefeller Archive Centre (RAC), IHB, 1.1, 464, B. 6 F. 40.

[27] Mark Harrison, *Public Health in British India,* Cambridge, Cambridge University Press, 1994, 228.

[28] Ibid, 234.

[29] Anil Kumar, *op.cit*., 1998, 218.

[30] David Arnold, *Colonizing the Body,* Delhi, Oxford University Press, 1993, 3.

[31] E.O. Shakespeare, *Report on Cholera in Europe and India,* Washington, Govt.

Press, 1890, 391.

[32] Katherine Mayo, *Mother India,* Jonathan Cape, London, 1927. This book created a storm and had seven reprints in the very first year of its publication. For an equally sharp rejoinder, see C.S. RangaIyer, *Father India,* London, Selwyn & Blount Ltd, 1927.

[33] J.D. Megaw to W.S. Carter, Oct. 29, 1928, IHD, 1.1, 464, Box 5, f. 34, RAC.

[34] As an example, 'The old bearer who was told to boil the drinking water did so religiously everyday but added a similar quantity of dirty water to it so that it would be sooner ready for the memsahib to drink!' J.C. Hume Papers, GEN 2004, file H-20, Edinburgh University Library.

[35] IHB, 5/2/Sp. Report, Box 49, f. 304, RAC.

[36] IHB, 6.7, 1, 6, f.35, RAC.

[37] GO No. 755, P.H. dt. June 1, 1922, IHB, 5/3/Rep. Box 24, Hookworm Report, 1923, RAC.

[38] Han Mesters, *op.cit.*

[39] For interesting details see, Paul van der Veur, *Toward a Glorious Indonesia: Reminiscences and Observations of Dr. Soetomo,* Southeast Asia series 81, Ohio, Ohio Univ. Press, 1987.

[40] P.V. Sharma, *History of Medicine in India*, New Delhi, INSA,1992.

[41] Jan Meulenbeld's gargantuan *History of Indian Medical Literature* is an example.

[42] Ian Holliday, Traditional Medicine in Modern Societites,' *Journal of Medicine and Philosophy*, 28, 3, 2003,379-389.

[43] The first important patron of 'reformed' or 'scientificized' Chinese medicine was Yen His-Shan, the Governor of Shansi. In 1921 he set up a 'Research Society for the Reform of Chinese Medicine', which would try to combine the best features of the Chinese and Western medicine.

[44] For critical appraisal see, S. Cant and U. Sharma, A New Medical Pluralism?,UCL Press, 1999, 2014 reprint, London, Routledge; R. Porter (ed.) *The Popularisation of Medicine*, 1650-1850, London, Routledge, 1992.

[45] As Ernst argues, 'One has to steer between the Scylla of imposing the well-tried and supposedly superior scientific criteria of bio-medicine and the Charybdis of leaving the public exposed to potentially unprofessional, unethical and fraudulent practices'. W. Ernst, *Plural Medicine: Tradition and Medicine*, London, Routledge, 2002, 1-18.

[46] Warwick Anderson, 'Postcolonial Histories of Medicine', in Frank Huisman and John H. Warner (eds.), *Locating Medical Histories*, Baltimore, The Johns Hopkins University Press, 2004, 284-306.

[47] Thomas McKeown, 'A Sociological Approach to the History of Medicine', *Medical History*, XIV, 1970, 342-351; Reiterated in D. Porter, 'The Mission of Social History of Medicine: A Historical View', *Social History of Medicine*, 7, 3, 1995, 345-359.

[48] Paul Weindling (eds.), *The Social History of Occupational Health*, Croom Helm, London, 1985, p. 6.

[49] Lars Noath and Barbara Noah, *Medicine and Medical Technology*, New York, Fountain Press, 2002.

[50] Bjorn Hofmann, 'Medicine as Techne: A Perspective from Antiquity', *Journal of Medicine and Philosophy*, 28, 4, 2003, 403-425.

[51] An outstanding example is HormozEbrahimnejad (ed.), *The Development of Modern Medicine in Non-Western Countries: Historical Perspectives*, London, Routledge, 2009. See also, Andrew Cunningham and Bridie Andrews (eds.) *op cit.*, 1997; a recent addition is Hans Pols, *Nurturing Indonesia: Medicine and Decolonisation in the Dutch East Indies*, CUP, Cambridge, 2018.

XXII.

The DESIGN *of a* TREATISE *on the* PLANTS *of* INDIA.

By the PRESIDENT.

THE greateſt, if not the only, obſtacle to the progreſs of knowledge in theſe provinces, except in thoſe branches of it, which belong immediately to our ſeveral profeſſions, is our want of leiſure for general reſearches; and, as ARCHIMEDES, who was happily maſter of his time, had not *ſpace* enough to move the greateſt weight with the ſmalleſt force, thus we, who have ample ſpace for our inquiries, really want *time* for the purſuit of them. "Give me a place to ſtand on, ſaid the great mathe-" matician, and I will move the whole earth:" *Give us time*, we may ſay, *for our inveſtigations, and we will transfer to* Europe *all the ſciences, arts, and literature of* Aſia. "Not to have deſpaired," however, was thought a degree of merit in the *Roman* general, even though he was defeated; and, having ſome hope, that others may occaſionally find more leiſure, than it will ever, at leaſt in this country, be my lot to enjoy, I take the liberty to propoſe a work, from which very curious information, and poſſibly very ſolid advantage, may be derived.

SOME hundreds of plants, which are yet imperfectly known to *European* botaniſts, and with the virtues of which they are wholly unacquainted, grow wild on the plains and in the foreſts of *India*: the *Amarcòſh*, an excellent vocabulary of the *Sanſcrit* language, contains in one chapter the names of about three hundred medicinal vegetables; the *Médini* may com-

prize many more; and the *Dravyábhidhána*, or *Dictionary of Natural Productions*, includes, I believe, a far greater number; the properties of which are diſtinctly related in medical tracts of approved authority. Now the firſt ſtep, in compiling a treatiſe on the plants of *India*, ſhould be to write their true names in *Roman* letters, according to the moſt accurate orthography, and in *Sanſcrit* preferably to any vulgar dialect; becauſe a learned language is fixed in books, while popular idioms are in conſtant fluctuation, and will not, perhaps, be underſtood a century hence by the inhabitants of theſe *Indian* territories, whom future botaniſts may conſult on the common appellations of trees and flowers: the childiſh denominations of plants from the perſons, who firſt deſcribed them, ought wholly to be rejected; for *Champaca* and *Hinna* ſeem to me not only more elegant, but far properer, deſignations of an *Indian* and an *Arabian* plant, than *Michelia* and *Lawſonia*; nor can I ſee without pain, that the great *Swediſh* botaniſt conſidered it as *the ſupreme and only reward of labour* in this part of natural hiſtory, to preſerve a name by hanging it on a bloſſom, and that he declared this mode of promoting and adorning botany, worthy of being *continued with holy reverence*, though ſo high an honour, he ſays, *ought to be conferred with chaſte reſerve, and not proſtituted for the purpoſe of conciliating the good will, or eternizing the memory, of any but his choſen followers; no, not even of ſaints:* his liſt of *an hundred and fifty* ſuch names clearly ſhows, that his excellent works are the true baſis of his juſt celebrity, which would have been feebly ſupported by the ſtalk of the *Linnæa*. From what proper name the *Plantain* is called *Muſa*, I do not know; but it ſeems to be the *Dutch* pronunciation of the *Arabick* word for that vegetable, and ought not, therefore, to have appeared in his liſt, though, in my opinion, it is the only rational name in the muſter-roll. As to the ſyſtem of LINNÆUS, it is the ſyſtem of Nature, ſubordinate indeed to the beautiful arrangement of *natural orders*,

of which he has given a rough ſketch, and which may hereafter, perhaps, be completed: but the diſtribution of vegetables into *claſſes*, according to the number, length, and poſition of the ſtamens and piſtils, and of thoſe *claſſes* into *kinds* and *ſpecies*, according to certain marks of diſcrimination, will ever be found the cleareſt and moſt convenient of methods, and ſhould therefore be ſtudiouſly obſerved in the work, which I now ſuggeſt; but I muſt be forgiven, if I propoſe to reject the *Linnean* appellations of the twenty-four *claſſes*, becauſe, although they appear to be *Greek*, (and, if they really were ſo, that alone might be thought a ſufficient objection) yet in truth they are not *Greek*, nor even formed by analogy to the language of *Grecians*; for *Polygamos*, *Monandros*, and the reſt of that form, are both maſculine and feminine; *Polyandria*, in the abſtract, never occurs, and *Polyandrion* means a publick cemitery; *diœcia* and *diœcus* are not found in books of authority; nor, if they were, would they be derived from *dis*, but from *dia*, which would include the *triœcia*; let me add, that the *twelfth* and *thirteenth* claſſes are ill diſtinguiſhed by their appellations, independently of other exceptions to them, ſince the real diſtinction between them conſiſts not ſo much in the *number* of their ſtamens, as in the *place*, where they are inſerted; and that the *fourteenth* and *fifteenth* are not more accurately diſcriminated by two words formed in defiance of grammatical analogy, ſince there are but *two* powers, or two *diverſities of length*, in each of thoſe claſſes. *Calycopolyandros* might, perhaps, not inaccurately denote a flower of the *twelfth* claſs; but ſuch a compound would ſtill ſavour of barbariſm or pedantry; and the beſt way to amend ſuch a ſyſtem of words is to efface it, and ſupply its place by a more ſimple nomenclature, which may eaſily be found. Numerals may be uſed for the *eleven* firſt claſſes, the former of two numbers being always appropriated to the *ſtamens*, and the latter, to the *piſtils*: ſhort phraſes, as, *on the calyx*

or *calice*, *in the receptacle*, *two long*, *four long*, *from one baſe*, *from two*, or *many*, *baſes*, *with anthers connected*, *on the piſtils*, *in two flowers*, *in two diſtinct plants*, *mixed*, *concealed*, or the like, will anſwer every purpoſe of diſcrimination; but I do not offer this as a perfect ſubſtitute for the words, which I condemn. The allegory of *ſexes* and *nuptials*, even if it were complete, ought, I think, to be diſcarded, as unbecoming the gravity of men, who, while they ſearch for truth, have no buſineſs to inflame their imaginations; and, while they profeſs to give deſcriptions, have nothing to do with metaphors: few paſſages in *Aloiſia*, the moſt impudent book ever compoſed by man, are more wantonly indecent than the hundred-forty-ſixth number of the *Botanical Philoſophy*, and the broad comment of its grave author, who *dares*, like OCTAVIUS in his epigram, *to ſpeak with* Roman *ſimplicity*; nor can the *Linnean* deſcription of the *Arum*, and many other plants, be read in *Engliſh* without exciting ideas, which the occaſion does not require. Hence it is, that no well-born and well-educated woman can be adviſed to amuſe herſelf with botany, as it is now explained, though a more elegant and delightful ſtudy, or one more likely to aſſiſt and embelliſh other female accompliſhments, could not poſſibly be recommended.

WHEN the *Sanſcrit* names of the *Indian* plants have been correctly written in a large paper-book, one page being appropriated to each, the freſh plants themſelves, procured in their reſpective ſeaſons, muſt be conciſely, but accurately, *claſſed* and *deſcribed*; after which their ſeveral *uſes* in medicine, diet, or manufactures, may be collected, with the aſſiſtance of *Hindu* phyſicians, from the medical books in *Sanſcrit*, and their accounts either diſproved or eſtabliſhed by repeated experiments, as faſt as they can be made with exactneſs.

By way of example, I annex the deſcriptions of five *Indian* plants, but am unable, at this ſeaſon, to re-examine them, and wholly deſpair of leiſure to exhibit others, of which I have collected the names, and moſt of which I have ſeen in bloſſom.

I. MUCHUCUNDA.

Twenty, from One Baſe.

Cal. Five-parted, thick; leaflets, oblong.

Cor. Five petals, oblong.

Stam. From twelve to fifteen, rather long, fertile; five ſhorter, ſterile. In ſome flowers, the *unprolifick* ſtamens, longer.

Piſt. *Style* cylindrick.

Peric. A capſule, with five cells, many-ſeeded.

Seeds: Roundiſh, compreſſed, winged.

Leaves: Of many different ſhapes.

Uſes: The quality, refrigerant.

One flower, ſteeped a whole night in a glaſs of water, forms a cooling mucilage of uſe in virulent gonorrhœas. The *Muchucunda*, called alſo *Pichuca*, is exquiſitely fragrant: its calyx is covered with an odoriferous duſt; and the dried flowers in fine powder, taken like ſnuff, are ſaid, in a *Sanſcrit* book, almoſt inſtantaneouſly to remove a nervous head-ach.

Note. This plant differs a little from the *Pentapetes* of Linnæus.

II. BILVA or MA'LU'RA.

Many on the Receptacle, and One.

Cal. Four, or five, cleft, beneath.

Cor. Four, or five, petals; moſtly reflex.

Stam. Forty, to forty-eight, filaments; anthers, moſtly erect.

Piſt. *Germ*, roundiſh; *Style*, ſmooth, ſhort; *Stigma*, clubbed.

Peric. A ſpheroidal berry, very large; many-ſeeded.

Seeds: Toward the ſurface, ovate, in a pellucid mucus.

Leaves: Ternate; common petiole, long; leaflets, ſubovate; obtuſely notched, with ſhort petioles; ſome almoſt lanced.

Stem: Armed with ſharp thorns.

Uſes: The fruit nutritious, warm, cathartick; in taſte, delicious; in fragrance, exquiſite: its aperient and deterſive quality, and its efficacy in removing habitual coſtiveneſs, have been proved by conſtant experience. The mucus of the ſeed is, for ſome purpoſes, a very good cement.

Note. This fruit is called *Srip'hala*, becauſe it ſprang, ſay the *Indian* poets, from the milk of *Srì*, the goddeſs of abundance, who beſtowed it on mankind at the requeſt of ISWARA, whence he alone wears a chaplet of *Bilva* flowers; to him only the *Hindus* offer them; and, when they ſee any of them fallen on the ground, they take them up with reverence, and carry them to his temple. From the firſt bloſſom of this plant, that I could inſpect, I had imagined, that it belonged to the ſame claſs with the *Durio*, becauſe the filaments appeared to be diſtributed in five ſets; but in all, that I have ſince examined, they are perfectly diſtinct.

III. SRINGATACA.

Four and One.

Cal. Four cleft, with a long peduncle, above.

Cor. Four petals.

Stam. Anthers, kidney-ſhaped.

Piſt. *Germ*, roundiſh; *Style*, long as the filaments; *Stigma* clubbed.

Seed: A *Nut* with four oppoſite angles (two of them *ſharp* thorns) formed by the *Calyx*.

Leaves: Thoſe, which float on the water, are rhomboïdal; the two upper ſides unequally notched, the two lower, right lines. Their petioles, buoyed up by ſpindle-ſhaped ſpongy ſubſtances, not bladders.

Root: Knotty, like coral.

Uſes: The freſh kernel, in ſweetneſs and delicacy, equals that of the filbered. A mucus, ſecreted by minute glands, covers the wet leaves, which are conſidered as cooling.

Note. It ſeems to be the floating *Trapa* of LINNÆUS.

IV. PUTI CARAJA.

Ten and One.

Cal. Five-cleft.

Cor. Five equal petals.

Peric. A thorny legumen; two ſeeds.

Leaves: Oval, pinnated.

Stem: Armed.

Uſes: The ſeeds are very bitter, and, perhaps, tonick; ſince one of them, bruiſed and given in two doſes, will, as the *Hindus* aſſert, cure an intermittent fever.

V. MADHUCA. (*See Vol. I, page* 300.)

Many, *not* on the Receptacle, and One.

Cal. *Perianth* four, or five, leaved.

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Cor. One-petaled. *Tube* inflated, fleſhy. *Border* nine, or ten, parted.

Stam. *Anthers* from twelve to twenty-eight, erect, acute, ſubvillous.

Piſt. *Germ*, roundiſh; *Style*, long, awl-ſhaped.

Peric. A *Drupe*, with two or three *Nuts*?

Leaves: Oval, ſomewhat pointed.

Uſes: The *tubes*, eſculent, nutritious; yielding, by diſtillation, an inebriating ſpirit, which, if the ſale of it were duly reſtrained by law, might be applied to good purpoſes. A uſeful oil is expreſſed from the ſeed.

Note. It reſembles the *Baſſia* of KOENIG.

SUCH would be the method of the work, which I recommend; but even the ſpecimen, which I exhibit, might, in ſkilful hands, have been more accurate. Engravings of the plants may be annexed; but I have more than once experienced, that the beſt anatomical and botanical prints give a very inadequate, and ſometimes a very falſe, notion of the objects, which they were intended to repreſent. As we learn a new language, by reading approved compoſitions in it with the aid of a Grammar and Dictionary, ſo we can only ſtudy with effect the natural hiſtory of vegetables by analyſing the plants themſelves with the *Philoſophia Botanica*, which is the *Grammar*, and the *Genera et Species Plantarum*, which may be conſidered as the *Dictionary*, of that beautiful language, in which nature would teach us what plants we muſt avoid as noxious, and what we muſt cultivate as ſalutary, for that the qualities of plants are *in ſome degree* connected with the *natural orders* and *claſſes* of them, a number of inſtances would abundantly prove.

William Jones, "The Design of a Treatise on the Plants of India", *Asiatick Researches: or, Transactions of the Society,* Volume the Second, Calcutta, 1790, 345-352.

Nupur Dasgupta

The second volume of the *Asiatick Researches* carried a long proposal from the President of the Asiatic Society for compiling a well-researched treatise on Indian plants.[1] The first step, as Jones indicated, would be to draw up a comprehensive list of the plants of the country, still unknown or incompletely known among the European botanists. Their 'true' names were proposed by him to be written in Roman letters with correct orthography. By 'true' names, Jones argued for using the Sanskrit names which were found in the texts like the *'Amaracosh'* or the *'Dravyabidhana'*, which Jones termed as 'Dictionary of Natural Productions'. Jones would go on to publish four more tracts on Indian plants in the journal which have aroused the interest of historians if not the botanists. His urge for botany, which he termed as 'a bewitching study', stemmed both from natural inclination as well as external academic and political stimuli.

The study of botany was growing with scientific rigour since the publication of Carl Linnaeus' *Species Plantarum* (1753). Jones was informed of these developments and expressed his admiration for the works of Linnaeus.[2] But more than that he bore an innate love for nature and a natural inclination to enjoy the environs in India. Jones' personal life at the cottage at Krishnagar where he and his wife had planted a garden and closely studied the local plants were observed by scholars and his enthusiasm for botany was considered as representing a kind of romantic orientalism.[3] Jones' letters testify to his bearing almost a reverent attitude to the bounties of nature. Theresa M. Kelley comments on the rare combination in Jones of deism,

domesticity and love for botany which, as we see it, transcended the boundaries of rigid scientific parameters of study. But it was also a part of the orientalism that Jones represented. As we would observe, Jones bore a rather complex approach to Indian flora, where his romantic encounter with India and appreciation of her culture was equally balanced by his desire to enrich his own culture and country both intellectually and materially. In this latter goal he was following the command of his friend and that master navigator for the empire, Joesph Banks.

Jones' explorations into India's floral bounty was preceded by the long and extremely significant history of European ventures into documenting India's floral wealth, going back to the early, 16th century work by the Portuguese Jewish physician, Garcia da Orta[4] and the 17th century twelve – volume compendium, *Hortus Malabaricus*.[5] The *Hortus* had the greatest impact on the later-day scientific projects on plants from India. The rich and well- illustrated treatise became a rich mine for the botanists to dig in for tropical plants. This was especially so for Linnaeus, as the illustrations and minute morphological descriptions were important for identifying and naming of species.[6] Thenceforth Rheede's identifications repeatedly appeared in European works dealing in tropical plants, but with Linnaeus' systematized binomials after the publication of his *Species Plantarum* (1753). The study of Indian plants, even the processes of their identification thus began to veer away from vernacular knowledge.

In the late 18th century the main contributions to the field-based knowledge came from the German physician – naturalist and pupil of Linnaeus, J. G. Koenig and his associates, including William Roxburgh. They were in communication with various researchers in Europe and especially with Joseph Banks.[7] The knowledge of Indian flora was getting slowly incorporated into the order of botany although it was not comprehensive. But processes of institutionalized control over botanical knowledge and resources were under way, especially with the towering presence of champions of the empire like Joseph Banks. Banks was instrumental in gathering the valuable data from the researchers in India. He would be the main force behind the final

publication of the volumes on plants of Coromandel (1795) by Roxburgh, who would shortly go to steer the ship of imperial botany in the colony.[8]

Jones' proposal for the treatise came at a time when Banks' interventions into the East India company's botanical projects in India had successfully ended in the establishment of the Royal Botanic Garden in Calcutta (1787). Banks and Jones, schoolmates, fellow members of the Royal Society and cohorts of the same intellectual circuit, exchanged a stream of correspondences between the years 1788 and 1792. Garland cannon's meticulous analysis of these correspondences reveal how Jones was drawn deeper and deeper into the growing tide of what Richard Grove termed, Green Imperialism that Banks spearheaded.[9] The letters reveal both Banks and Jones engaging in discussions of India's flora. Banks was overt about his aim to import knowledge and specimens of plants from India for economic and other gains for the empire. Jones, on the other hand, exhibited an academic interest on a subject that was close to his heart. His chief interest was to garner the knowledge of Indian plants in a systematic manner that would go a long way in aiding the investigations. At the beginning Jones was quick enough to jump on board Banks' mega project. Cannon points to how Jones took the cue from Banks. By 1789 he was commissioning some of the members of the Asiatic Society to collect specimens and send descriptions of plants they encountered in various parts of British India and abroad where they chanced to be stationed. Roxburgh's article on Butea, the *Palasa* tree was published in the third volume of the *Asiatick Researches*.[10] The year-long (1788-89) association with Banks' project had perhaps been the major influence behind the grand design for the treatise Jones set out to propose in the second volume of the *Asiatick Researches* in 1790. The proposal indeed bore a strong imperialist tone when Jones asserted his aim to transfer all knowledge of Asia to Europe. Already since 1787 Jones took an active role in urging the Company for an official step towards facilitating the study of India's natural history. Richard Grove was of the opinion that the influences of both Banks and Jones were effective in initiating the system of botanical

gardens by the East India Company.[11] On the more academic side, however, Grove cites a letter from Jones to point out how his comprehension of the natural world directed him towards a tentative idea of ecology and its intimate relations with botany.[12]

But there was much more to Jones' proposal of 1790. Jones was retracing from his earlier appreciation for Linnaeus[13] and felt compelled to criticise Linnaeus' binomial classification as 'barbarous and pedantic'.[14] Tim Fulford, like Theresa M. Kelley saw a more intimate and morally intoned approach in Jones' plans for Indian flora. He was not only unhappy with Linnaeus' binomials based on the names of the first Europeans who 'discovered' them, but openly favoured naming them with local indigenous names, preferably using the Sanskrit names as these were standardised in India's textual tradition.[15] Jones rationalized his approach of privileging Indian names on the basis of the close knowledge the Indians possessed about what was their own and what the Europeans were not privy to. But he was also essentializing that knowledge and seeking to put them in the "classical sanskrit" frame that he had been particularly projecting since the early days of his reconnaissance of Indian culture and history. He will go on to employ the Sanskrit names as what has been termed "uninomials"[16] in his posthumously published article "Catalogue of Indian Plants"[17] where such "uninomials" would be followed by Linnaean or other scientific equivalents, wherever such equivalents were available. But in the last and most important of his botanical publications, entitled "Botanical Observations on Select Indian Plants",[18] Jones provided greater details, which illuminates his own epistemic comprehension of how the study of indigenous flora should be styled. He provided Sanskrit and common vernacular names as well as Latin names where available along with short mythological, literary and utility related information, including the medical which he specially mentioned at the outset.

Jones' project might have been a novel contribution. But his system could not be accepted within the epistemic frame of botany set in the order of Linnaeus. The rigours of botanical naming would be gathering force till the 1972 international code for binomial names fixed the rule

the world over. Late Brian Thomas Styles, the renowned botanist and late Senior Research Fellow of the Oxford Forestry Institute had regretfully recorded his surprise at the total neglect of Jones' articles by the botanists. Styles' arguments provide much food for thought and sets us pondering over the course of the historical evolution of rational knowledge.[19] Jones, however, did set a trend of putting together important information on plants that would be taken up by another line of researchers. Twenty years down the line John Fleming, a physician in the Company's service would compile data on the indigenous plant medicines quite on the lines of Jones but with richer scientific information which was published in the pages of the *Asiatick Researches*.[20] Others from the same profession like Whitelaw Ainslie[21] urged by similar concerns would follow suit.[22]

The alternate optics of history of knowledge and power[23] often lead us to search for the peripheral stories such as this in the history of knowledge.

Notes

[1] William Jones, "The Design of a Treatise on the Plants of India", *Asiatick Researches: or, Transactions of the Society*, Volume the Second, Calcutta, 1790, 345 – 352.

[2] Letter of 22 September 1787, *The Letters of Sir William Jones,* ed., Garland Cannon, (2 vols), Oxford, Oxford University Press, 1970, Vol. II, 776.

[3] Theresa M. Kelley, *Clandestine Marriage: Botany and Romantic Culture,* Baltimore, Maryland, The John Hopkins University Press, 2012, 179 – 182; Tim Fulford, "Indian Flowers and Romantic Orientalism", in Tim Fulford, Debbie Lee, Deborah Jean Lee, Peter J. Kitson, *Literature, Science and Exploration in the Romantic Era: Bodies of Knowledge*, Cambridge, University Press, 2004, 71 – 89.

[4] Garcia Da Orta, *Coloquios dos simples e drogas e cousasmedicinais da India, volume consulted: Colloquies on the Simples and Drugs of India By Garcia Da Orta,* New ed. (Lisbon, 1895) ed. and annotated, by the Conde De Ficalho, trans. with an introduciton and index by Sir Clements Markham, (2 vols.), London, Henry Sotheran and Co., 1913.

[5] Henricum Van Rhede Tot Draakestein, *Horti Malabarici, Notes and Commentaries, Joannes Commelinus,* (12 vols.), Amsterdam: Sumptibus viduae Joannis van Someren and others, 1678-1703.

[6] William T. Stearn, "Carl Linnaeus's Acquaintance with Tropical Plants", *Taxon,* vol. 37, no. 3, (Aug., 1988), 776 – 781.

[7] Rajesh Kochar, "Natural History in India during the 18th and 19th Centuries", Perspectives, *Journal of Bioscience,* vol. 38 no. 2, (June 2013), 201-224.

[8] Preface by Patrick Russell, in William Roxburgh, *Plants of the Coast of Coromandel*, Vol. I, London, The Court of Directors of the East India Company, 1795, i – v; K.M. Matthew, William Roxburgh's Plants of the Coast of Coromandel : An Enumeration of Species", *BLUMEA*, vol. 49 (Dec 2004), 367-405.

[9] Garland Cannon, "Sir William Jones, Sir Joseph Banks, and the Royal Society", *Notes and Records of the Royal Society of London*, vol. 29, no. 2 (Mar., 1975), 205-230.

[10] William Roxburgh, "A Description of the Plant Butea", *Asiatick Researches,* Volume the Third, London, 1799, 469-474.

[11] Richard Grove, op. cit., 1995, 340 – 341.

[12] Letter of 18 October, 1791, *The Letters of Sir William Jones,* Vol. II, 892, also cited by Grove, *op. cit.,* 1995, 341.

[13] Letter of 22 September 1787, *The Letters of Sir William Jones,*Vol. II, 776, also cited by Tim Fulford, "Indian Flowers and Romantic Orientalism", in Tim Fulford, Debbie Lee, Deborah Jean Lee, Peter J. Kitson, *Literature, Science and Exploration in the Romantic Era: Bodies of Knowledge*, Cambridge, University Press, 2004, 79.

[14] Letter of 18 October, 1791, *The Letters of Sir William Jones*, Vol. II, 892, cited by Tim Fulford, op. cit., 2004, 80.

[15] See *Asiatick Researches,* Vol. 2, 346.

[16] B. T. Styles, "Sir William Jones' Names of Indian Plants", *Taxon*, vol. 25, no. 5/6, (Nov. 1976), 671-674.

[17] *Asiatick Researches*, Vol. 4, 1795, 225-229.

[18] *Asiatick Researches*, Vol. 4, 1795, 231-301.

[19] Styles, op. cit., *Taxon,* Nov. 1976.

[20] John Fleming, "A Catalogue of Indian Medical Plants and Drugs, with their Names in the Hindustani and Sanscrit Languages", *Asiatick Researches*, Vol. 11, 1810, 153-196.

[21] Whitelaw Ainslie, *Materia Medica of Hindoostan and Artisan's and Agriculturalist's Nomenclature,* Madras, Government Press, 1813.

[22] Projit Bihari Mukharji points to the critical state of confusion regarding nomenclature of plants in India prevalent throughout the 19th century, especially pointing to the gap between the common market based vernacular knowledge and names in the official botanical/ scientific catalogues. He placed Jones' posthumously published article "Botanical Observations on Select Indian Plants" (*Asiatick Researches*, Vol. IV, 1795, 237-312) at the top of the list of official published English texts on Indian plants at the turn of the 19th century. Projit Bihari Mukharji, "What's in a Name? : The Crisis of Botanical Identification and the Production of 'Economic Man'", *Social Scientist*, Vol. 33, No. 5/6 (May - Jun., 2005), pp. 3-25.

[23] Kapil Raj, Introduction, *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650–1900*, Hampshire, New York, Palgrave Macmillan, 2007, 8-10.

Shinjini Das, *Vernacular Medicine in Colonial India : Family, Market and Homoeopathy*, Cambridge, Cambridge University Press, 2019, pp. xiv + 292, Hardcover $ 33.85.

Whenever a discussion on the endeavors of the indigenous or 'other' medicines and their encounters with the colonial framework occurs in the academia, there are a few cardinal issues popping up that require to be meticulously explored, such as, how far these approaches were perceived as trivial to the emerging 'modern' medicine in the Empire, to what extent these 'other' medicines were popularized through the labyrinthine relations of reception and response in the colonial medical markets and how the familial ties play a pivotal role in manufacturing or rather commercializing the 'other' medicines. Shinjini Das has succeeded in teasing out all these essentials extensively in her text while contextualizing homoeopathy as one of the 'vernacular' medicines in colonial Bengal. A recent trend is transpiring among the leading scholars working on colonial medicine which relates to the hitherto uncharted intricacies, complexities and dynamism of indigenous medicine in the contested medical environs of the British Raj. However, homoeopathy had received little attention so far. This book definitely ushers in the social history of homoeopathy in British India within the circle of serious scholarship. Homoeopathy was introduced in Germany as a 'distinct therapeutic ideology' since the 1790s by Friedrich Christian Samuel Hahnemann of Saxony (1755-1843). However, despite being a part of the western form of medical philosophy, homoeopathy had faced antagonism from the British colonial regime in India along with the 'other' therapeutic practices, such as phrenology, mesmerism, herbalism, hydropathy and naturopathy. Homoeopathy was also regarded as 'European medical and scientific heterodoxy' which was hardly attuned with the ideologies of the Raj. Therefore, it largely found itself estranged in the alien society until the intellectual convictions and objectives of the

colonized got tied to homoeopathy (pp. 2-3). It is true that Bengal was situated at the center of activities concerning ideas of homoeopathy, the manuals published for its propagation, the practitioners of the system as well as the pharmacies. Homoeopathy had arrived in the medical arena of Bengal with the English missionaries and the 'amateurs in the civil and military services' who appeared to be the early advocates of this medical knowledge (p. 4). The growth of homoeopathy was often disrupted even censured as a 'growing scandal' burgeoning inside the 'progressive' British imperial rule. This does not imply that the liaison between homoeopathy and the colonial state had been of unequivocal condemnation or negation. Instead, the way in which the system of opposition occurred indicated a multifaceted narrative of transactions, provenances and exploitations, shaping the *bhadralok* minds towards a preferernce for what was described by a section of them as a more plausible, 'rational', form of '*grihasthacikitsha*'. This was the reason that made homoeopathy a reliable field of 'scientific medicine' amongst considerable sections of the Bengali educated society from the mid Victorian period. The choice engendered a sort of medical culture, embracing the consumption of liquid mixtures, arguments over the theories of vitalism, interpretations and appraisals of the prime German texts, the preparation of the home-made drugs with local herbs and the study of ceremonial conventions about the ethical mechanization in quotidian life. Shinjini Das has intended to show that this particular cultural discourse that materialized in the name of 'homoeopathy', was perceived by different social groups in colonial India either as 'western, rational, progressive science' or as 'indigenous spiritual practice, often accused of quackery'. Notwithstanding these varied stands, the undefined quality of homoeopathy, which prospered in the long nineteenth century, turned out to be an omnipresent element of colonial and post-colonial modernity (p. 6).

Having an access to the rich collections or family archives of North Calcutta-based homoeopathic commercial houses, for example, Berigny and Company, M. Bhattacharya and Company, Hahnemann Publishing Company and Majumdar's Homoeopathic Pharmacy (now functions as J. N. M Homoeo Sadan), the author is able to reveal the embedded 'cultural and moral foundations' that delineated and made homoeopathy acceptable in Bengal. Low-cost drugs and publications and low fees of the physicians rendered an avenue even to the 'financially disadvantaged' sections. In contrast to the allopathic treatment, the placid nature of homoeopathic drugs appealed to the people seeking for 'cheap, affordable, and painless mode of therapeutics' that could be mastered by anyone who were not medical professionals *per se*. Homoeopathy produced a discrete outlook of 'egalitarian medicine' that would heal, as far as the claims of contemporary homoeopaths were concerned, not only the chronic ailments of individuals but also the epidemic diseases (such as malaria, cholera, plague, smallpox and venereal diseases) (p. 9). It was only in 1941 during the period of growing regional nationalism, that homoeopathy was officially recognized as 'scientific medicine' which led to the foundation of State Faculty of Homoeopathic Medicine in Bengal.

The book is divided into five chapters of which the first one, titled '*A Heterodoxy between Institutions: Bureaucracy, Print Market and Family Firms*', deals with the homoeopathic business houses and their practices and relations to the colonial bureaucracy and print market (pp.31-80). The second chapter, i.e. '*A Family of Biographies: Colonial Lives of a Western Heterodoxy*', focuses on the culture of biographies entombing a claimed heritage in the long nineteenth century (pp. 81-113). This is followed by the third chapter named '*A Science in Translation: Medicine, Language, Identity*'. In this chapter Das seeks to explore the genre of popular scientific translations of homoeopathic texts and trace the

ways in which western 'medical scientism' was adapted, modified and revised for the colonized. Undoubtedly, the entrepreneur-physicians along with their homoeopathic commercial ventures had endorsed the western origin of homoeopathy. This was reflected in the numerous publications like journals, manuals, medical monographs, biographies, memoirs which needed to disseminate the 'ceaseless transactions of ideas, drugs, people and pharmaceutical expertise' of the west. A sturdy sense of exhilaration of Bengali *bhadarloks* emanates in engaging with the very latest in 'modern science' (pp.114-154). The chapter four, titled '*Healing the Home: Indigeneity, Self-Help and the Hindu Joint Family*', probes into the daily health management which usually became an unalienable part of the medical lives of the *hindu* joint families. The very indigeneity, that influenced the *bhadralok* world of medicine, had provided a non-somber cultural trait in which homoeopathy could be integrated (pp.155-199). The last chapter, i.e. '*A Homoeopathic Public : Elections, Public Health and Legislation*' is on the familial cooperation and negotiation with the colonial law that made the 'Homoeopathic Public' emerge as a real presence in the medical market. (pp.200-245).

Initially in the early twentieth century, homoeopathy had faced various colonial prohibitions, regulations and disfavors until the late 1920s and 1930s when the familial business enterprises began to be enmeshed with the nationalist health propaganda that helped homoeopathy to gradually incorporate itself as an alternative medical practice in the institutionalized governmental public health register. With the formation of Provincial ministry in Bengal in 1937, homoeopathy came very much within official visibility along with the indigenous medicines, such as Unani and Ayurveda. The concept of restructuring homoeopathy suited to the project of 'national development'. However, the projection of an 'authentic homoeopathy' in India required a harmonious milieu guided by the standard scientific

factors of the state. The competence to negotiate the subtle power equilibrium in provincial politics between the Congress and Krishak Praja Party (KPP) gave homoeopathy the official recognition. In this process of 'recognition', the homoeopathic associations too were influenced by the thoughts that turned out to be more 'metropolitan' in nature in the reinforced medical hierarchies. The voices of the majority *mofussil* - based practitioners were systematically marginalized and portrayed as peripheral in the course of 'homoeopathic reformation'. Especially, the self-trained amateurs, those who were deemed to be the unique selling propositions in the early years of homoeopathy, were labelled as illegitimate. Finally, homoeopathic knowledge was radically modified through a dialogue with the elements of allopathic state medicine in terms of both curriculum and understanding. The author has problematized the concept of vernacular medicine in her text, inquiring the earlier definition. The question was not to what extent homoeopathy had been translated, domesticated or vernacularized in colonial Bengal between the 1860s and 1941, till the formation of State Faculty of Homoeopathy. Instead, it was the intent of the author to review the emergence and shaping of the realm of homoeopathic therapeutics into its specific field, from the functioning of elite practitioners, professionals, colonial legislators, provincial politicians to the activities of self-taught and lay practitioners in urban and suburban Bengal.

To Das, the vernacular medicine therefore was more than a 'subaltern, nationalist or Bengali-language domain'. It cut across the binaries of 'the western and the indigenous, the elite and the popular and the subaltern and the state', making the sphere of influence of vernacular homoeopathy a tangible presence in Bengal (pp. 246-255). The scholars such as Projit Bihari Mukherjee, Rachel Berger and Madhuri Sharma have pointed out that the enterprises of indigenous medicine in colonial India are difficult to comprehend without

understanding the dynamism of indigeneity embedded in the approaches of 'vernacular medicine' to the state, society and self. Shinjini Das has successfully charted the mechanisms through which this 'indigeneity' was displayed in its manifold forms and enterprises in the unfolding of 'homoeopathy' within the Bengali *samaj*. Therefore, homoeopathy, as a counter cultural and medical discourse did not attempt to replace the exclusivity of colonial medicine; rather, it had challenged the hegemony of allopathic medicine by entering into the inner domain of Bengali *grihasta*.

Apalak Das

Rohan Deb Roy and Guy N. A. Attewell, *Locating The Medical: Explorations in South Asian History,* New Delhi : Oxford University Press, 2018. pp. vi + 307. 950 ISBN - 13: 978-0-19-948671-7.

The book adds a freshness to the existing historiography of medicine in India. This freshness is brought about by the novel manner adopted in the understanding of the term 'medical'. Instead of studying the 'medical' in history as a category confined within strict walls of diseases, epidemics, institutions, practitioners, systems etc., the essays in the volume adopt a cross-disciplinary perspective and allocate multiple definitions to the term 'medical'. Taking up case-studies from different pockets of South-Asia between the nineteenth and the twenty-first centuries, these researches endeavor to trace the circumstances, events and agents to tease out a connotation of 'medical' and eventually interrogate the"*……medical about colonial medicine*'. The editors, Rohan Deb Roy and Guy N. A. Attewell, find the essays to represent a novel ontological approach to the History of Medicine within a conceptual paradigm influenced by Michel Foucault's *'historical ontology'* and Ian Hacking's idea of *'dynamic nominalism'*. This approach has been presented thematically under four heads.

The first group of essays has been placed under the theme, '*Production of the Medical*', where the 'medical' has been located amidst the social categories of gender and race. The section starts off with Durba Mitra's essay which has tracks the 'medical' in the mid-19th century medico-legal texts. Her study reveals how on occasions of crime against women or in crimes where women were held as key suspects, the scientific practice of medical examination of her private parts became an unavoidable part of the investigation. But, more than that, in fact, she digs out the history of this practice where state policy coalesced with the patriarchal social ideology concerning women's nature and created an officially validated tool for stigmatizing women's sexuality. We find how a non-medical actor, a *dhobi* (washer man) played a key role in this respect. Chandak Sengoopta finds the 'medical' in the colonial introduction of two scientific practices in Bengal in the nineteenth century, that is fingerprinting and mesmerism that aided in strengthening the colonial sociology concerning the 'dubious' nature

and the 'distressed and depressed' states of mind of the natives. Continuing with the story of the 'natives', Sudipta Sen finds how the discourse of 'enlarged spleen' was used to conjure up medical assessment of 'vulnerable, delicate and diseased body' of the native. He interrogates this discursive colonial pathology which was employed in covering up violence against the native poor in a racialized medical jurisprudence and represented the 'diseased body of the natives' as exhibits of 'tropical' weakness.

The second theme is 'Enactments of the Medical' wherein the essays have located the 'medical' in relation to the 'State'. Under this theme Jonathan Saha's essay takes up the case of the epidemic deaths in the Upper Burman jail at Thayetmyo in the nineteenth century. Saha shows how such deaths led to the disciplining of the prison regime and reveals how 'medical' at times was responsible in shaping the State's policy. The 'medical' element in State's policy-making has also been dealt with by Viswajit Pandya and Madhumita Mazumdar but in a different way. They dwell on how the 'medical' served as the core link for Dr. Ratan Chandra Kar in his medico-ethnographic account of the Jarawas and their interaction with the world outside their forest community. The authors in this essay argue that despite Dr. Kar's attempts in making western medicine acceptable to the tribal community, the State policy of protection enacted for the aboriginal tribes of Andaman and Nicobar Islands was in the way to its success and the traditional component was kept intact.

The third theme of this volume, entitled 'Rethinking Disconnections and Continuities' portray the 'medical' as an unstable category. This 'unstable' nature of the 'medical' has been dealt with by Clare Anderson in the light of J. P. Walker's unpublished and incomplete collection on 'eclectic medicine that owes its provenance in India during his service in the Indian jails in the nineteenth century. A glimpse reveals the collection to originate from diverse sources, from people belonging not only to Asia but also Europe and America and from different schools of medicine. Anderson commends the task of building up an archive with a universal approach but finds it to be inevitably unstable, stemming from an unknown part of Walker's life. Calum

Blakie's essay situates the unstable nature of the 'medical' in the Tibetan practice of medicine, the Sowa Rigpa. Blakie looks through the 1960s to 2010 and track show the Sowa Rigpa therapeutics works out within the domain of the 'medical' and emerged as a patient oriented, quality based medicine reaching the twenty first century transforming into at echnologically geared, market oriented therapeutic system. Blakie argues however, that the technological advancements and interaction with the outside world caused an instability and an indelible division within the Sowa Rigpa practitioners. In the last essay under this theme, James H. Mills traces the fate of cannabis, ranging from a commodity yielding high revenues, to its medical assaying as a medicinal plant by W. B. O'Shaughnessy to being declared a hazardous ingredient for health. Mills, an expert on the theme, shows how the unstable nature of the colonial policy on medicine and shifting connotations of medicine itself played out in this context. His essay emphatically revolves around the question, *'how medical was the colonial medicine?'*

Some novel aspects of study of the 'medical' have been discussed in the last section, highlighting diverse 'Contours of the Medical'. Shubha Ranganathan writes about a Maharashtrian temple complex, Mahanubhav and shows how this sacred site emerged as a healing centre for the common masses who are presumed to be down with unidentified illness caused by supernatural elements. The essay stresses on the blurring of boundaries between medical 'systems' and heterogeneous healing phenomena. Projit Bihari Mukharji's essay explores into the theme of diverse views on the 'medical' through the texts of Dr. Gopaul Chandra Ray and Rev. Lal Behari Dey, which represented the perception of health in the well-being of the inner self, calling attention to the importance of the mental well-being as crucial for a healthy body. Lastly, David Arnold's essay situates the 'medical' in the midst of the day-to-day activities of the people, especially in areas like streets, factories and homes. Arnold ties technological developments with the rise in mortality rates, especially calling attention to rates of accidents which have popped up in the context of poor infrastructural. To Arnold the 'medical' has to be

understood in a wider canvas and explored in these embedded man-made epidemics that evolved out of urbanization, industrial capitalism and technological developments.

The volume ends with an 'Afterword' by Mark Harrison, that puts up arguments to justify the logic initiated by the editors, that 'medical' cannot be held as a singular frame or 'analytical category'. As we go through the essays of this volume, we find how the 'medical' has been shown to get intersected with gender, race, colonial legislation and State policy. The essays also exhibit that the 'medical' is not necessarily required to be located in the hospitals, systems, or practitioners rather one could also locate it in unusual spots like correctional institutes, factories, workplaces and homes. The essays in the volume, taken together, assert a new 'medical' which cannot be ascribed a singular concrete meaning. At the same time, the account equally demonstrates how non-medical actors have played a 'pivotal' role in the'medical'. In Harrison's words it is more than a category, indeed 'a state of mind'. Overall, the volume bears a lucid tone and is successful to a great extent in broadening the concept of the 'medical', transforming the connotative contours of the history of medicine which will go a long way to inspire the young researchers and students of history to '*Locate the Medical*' in many of the untraversed spots of history.

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5. Concise Oxford Dictionary or Oxford Advanced Learners Dictionary (latest edn.) should be followed in spelling, punctuation and hyphenation. Where two spellings exist, use the British style not the American; for example, 'programme', not 'program' and 'colour', not 'color'.
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Books :
Rhys Davids, *Buddhist India,* London, 1933, 7.

Articles in Books :
H.V. Trivedi, "The Geography of Kautilya", *Indian Culture,* Vol. 1, 202ff.

Edited Volumes :
C.W. Troll, ed. *Muslim Shrines in India : Their Character, History and Significance,* Delhi, 1989.

Articles in Journals :
G. Hambly, "A Note on the Trade in Eunuchs in Mughal Bengal", *Journal of the American Oriental Society* (hereafter *JAOS*), Vol. 94(1), 1974, 125-29.

Articles in Edited Volumes
P. Gaeffke, "Alexander and the Bengal Sufis", in Alan W. Entwistle and Francoise Mallison, eds, *Studies in South Asian Devotional Literature, Research Papers, 1988-1991,* New Delhi/Paris, 1994, 278-84.

10. Book Reviews must contain name of the author/editor and the book reviewed, place of publication and publisher, year of publication, number of pages and price.

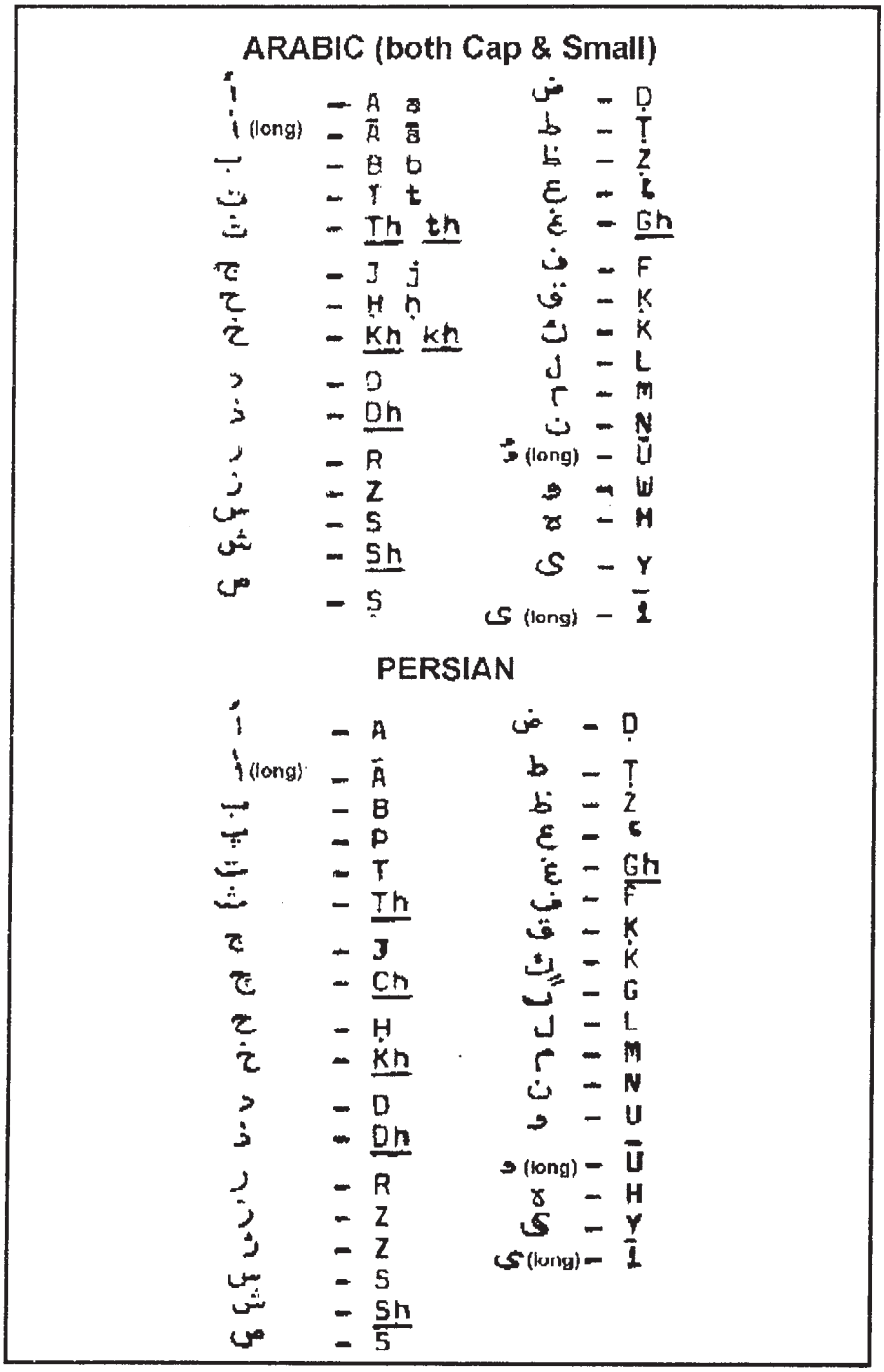
SYSTEM OF TRANSLITERATION

SANSKRIT

आ = ā		ई = ī	
ऊ = ū		ऋ = ṛ	
ङ = ṅa		च = ca	
छ = cha		ञ = ña	
ट = ṭa		ठ = ṭha	
ड = ḍa		ढ = ḍha	
ण = ṇa		श = śa	
ष = ṣa		ं = ṁ	

TIBETAN

ཀ = ka	ཁ = kha	ག = ga	ང = ṅa/nga
ཅ = ca	ཆ = cha	ཇ = ja	ཉ = ña/nya
ཏ = ta	ཐ = tha	ད = da	ན = na
པ = pa	ཕ = pha	བ = ba	མ = ma
ཙ = tsa	ཚ = tsha	ཛ = dza	ཝ = wa
ཞ = zha	ཟ = za	འ = 'a	ཡ = ya
ར = ra	ལ = la	ཤ = śa/sha	ས = sa
ཧ = ha	ཨ = a		


ARABIC (both Cap & Small)
PERSIAN

The Asiatic Society

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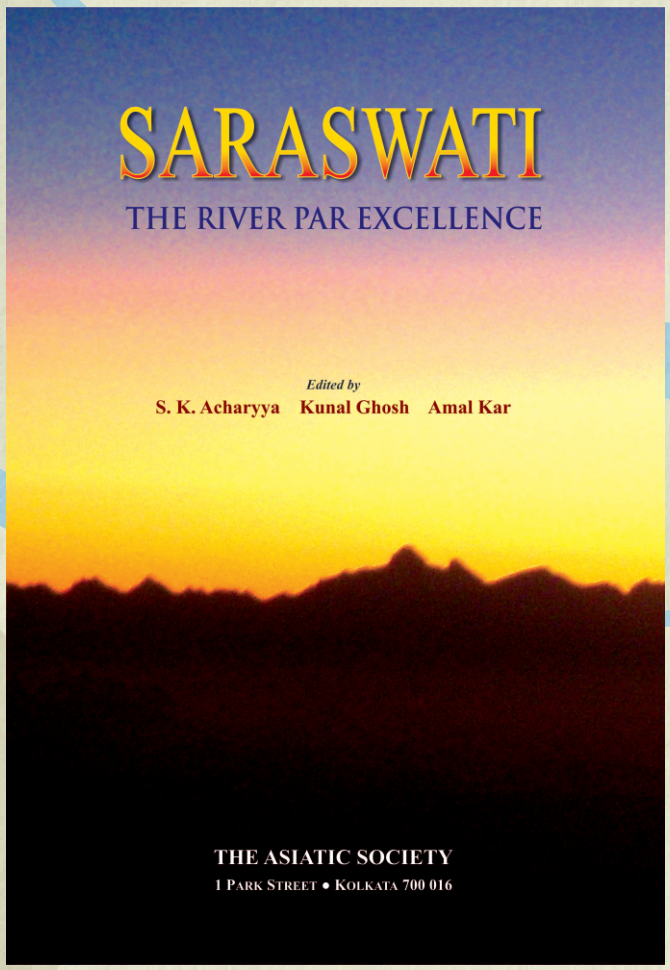

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It will flourish, if naturalists, chemists, antiquaries, philologers and men of science, in different parts of Asia, will commit their observations to writing, and send them to the Asiatick Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease.

Sir William Jones
on the publication of the Asiatic Society

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