

# **Environment, Disease and Medicine in Eastern India, 1900-1950s: Changes in Bengal's Western Frontier**

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Human intervention in transforming and refashioning the natural environment and its resultant ecological changes play a large role in the emergence of infectious disease. The effect of one's environment in the outbreak of disease and epidemics has been long recognized by scholars. In fact, the link between warm 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, starting with Enlightenment European scholars from the 17<sup>th</sup> and 18<sup>th</sup> centuries. The role of human beings in altering Nature is evident in the contemporary period of unprecedented human-induced global environmental changes, identified by some scholars as constituting the new geological age of the Anthropocene.<sup>1</sup> But alterations in the landscape can alter human bodies as much as human beings can alter places.<sup>2</sup> 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 lacked acquired or inherited resistance to unknown pathogens.

Since the 1990s, there has been considerable research on the histories of the environment and of medicine in India. These studies address wide-ranging issues such as environmental change since pre-colonial times, changing livelihoods, 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, there has been much less research on health and disease among India's Adivasi or 'tribal' population. Similarly, there have been few studies which explore the interaction of environment, health and medical history of people living in the margins.<sup>3</sup> My research project seeks to address this lacuna and investigates the relationship between environmental change, emerging diseases, and health practices in eastern and central India. Specifically, it concentrates on the Chotanagpur Division and Santal Pargana districts which formed part of the Bengal Presidency under British colonial rule, and which today are incorporated within

the Indian state of Jharkhand. Taking a long-term view, the project explores the fluid connection between landscape and health in pre-modern Adivasi society and analyses the interface between indigenous cultural beliefs and the state's medical intervention in colonial and post-colonial India.

My interest in this aspect of the Adivasi world of Chotanagpur arose out of my doctoral research on the socio-economic transition of an Adivasi community, the Hos of Singhbhum, under colonial rule.<sup>4</sup> I examined how the extension of cultivation, the spread of rice cultivation, and the increased restrictions upon the Adivasi people's access to the forest by the colonial government had resulted in famine, hunger, and migration. Chronic food shortages had also led to increased incidence of epidemic diseases in the region. Furthermore, forest restrictions impeded the age-old Adivasi practice of combatting disease by seeking refuge in the forest. From my research in the changing environmental and cultural landscape of the region in the 19<sup>th</sup> and 20<sup>th</sup> centuries, I began to look into how health and disease were conceptualized by the Adivasi people. Many of these indigenous understandings had been recorded both by Christian missionaries, such as P.O. Boddington, and by British colonial 'scholar-administrators,' like E.T. Dalton, W.W. Hunter and others. Seeking to understand how popular conceptions changed across time in the context of an altered environment and new forms of livelihood, I became interested in making a comparative study of Jharkhand in the colonial and post-colonial periods. In the latter period, there had been a number of studies on sanitation, health, hygiene, nutrition, women's health and reproductive health, conducted by both the government and non-governmental organisations, some of which were funded by Ford Foundation grants. I was also interested in tracing the environmental damage caused by mining and large-scale river valley projects (such as the Damodar Valley Project and the Subarnarekha River Valley Project) and their impact upon the health of the people of the region.

The research that I carried out at the Rockefeller Archive Center is part of a larger research project with four specific aims – first, to establish a general historical trajectory of climate and ecological change in Chotanagpur, the eastern part of the Deccan plateau, across the 19<sup>th</sup> and 20<sup>th</sup> centuries; secondly, to examine the means of livelihood in this region, together with cultural constructions of health and disease, emphasizing the convergences and

dislocations between the apparently divergent approaches represented by indigenous beliefs and modern medical practice; thirdly, to look into the emergence of a wide range of new diseases associated with the transformation of the political economy (for instance, new food habits, famine, hunger, the impact of mining and of radiation-related health issues due to uranium mining.) Finally, I wish to emphasize the link between agriculture, industry, nutrition and health, for which the project examines the post-independence health policies which were developed and implemented in line with the recommendations of international health organisations. My study will analyse the impact of these policies upon environmental management and promotion of healthcare.

At the Rockefeller Archive Center, I concentrated on reports concerning disease and health measures in the 20<sup>th</sup> century, particularly reports of the Rockefeller Foundation's International Health Board (IHB, later, the International Health Division) which throw light on multiple health-related problems and their probable solutions in India. The IHB undertook several schemes to combat malaria, hookworm, leprosy and other diseases in Madras, Mysore and elsewhere in India. In particular, the activities of the Rockefeller Foundation in eradication of malaria and hookworm were very much related to specific environments and stressed upon the need to spread awareness of the causes of the disease among the rural population. Since I could locate a number of documents dealing with the eastern part of Chotanagpur which today is located in the state of West Bengal, I decided to concentrate on locating the environment-related health issues of this zone and also broadened the scope of my research to include the health issues of the region as a whole, rather than focus only on the Adivasi population, about whom there were fewer Rockefeller Foundation records. This extension of my research area is also actuated by the understanding that the emergence of new diseases due to ecological change, as well as control of disease through control over one's immediate environment, affects both the indigenous and the immigrant population in a region. Supplementing this, in the records of the Ford Foundation archives, I found invaluable documents which highlight people's attitudes to their environment, indigenous medicine, local practices to ward off disease and people's attitudes to modern medicine.

Drawing upon these varied sources, I could develop an outline of the broad environmental and medical issues of this 'frontier' plateau zone between the plains of North India and Bengal in the first half of the 20<sup>th</sup> century which will be discussed in the following three sections. The first section gives an overview of the landscape and livelihoods of the region, the second discusses the changing nature of disease and their relation to the environment over the 19<sup>th</sup> and 20<sup>th</sup> centuries, while the third section gives an account of the Rockefeller Foundation's role in creating awareness over this area's health and hygiene.

## **Changing Landscape of Bengal's Western Frontier**

Located in the eastern end of the Deccan plateau where it merges into the plains of Bengal, the Chotanagpur constitutes an environmentally heterogeneous region. 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 complex spatial polities on the one hand, while on the other, climatic conditions and varied topographies generated multiple livelihood patterns and forms of social control.<sup>5</sup>

Within this agrarian environment, consisting of a hilly, forested terrain and a hot, dry climate with low rainfall for most parts of the year, multiple agricultural practices had arisen according to variations in landforms, control over landscapes, the nature of state power, and belief systems. By the end of the 18<sup>th</sup> century, settled agriculture had come to prevail among the dominant Adivasi groups who had already been absorbed into the revenue collecting apparatus of the indigenous states. They inhabited the open, fertile spaces in the plateau which had been cleared of forest cover. However, the swift-flowing, seasonal rivers and streams traversing the district were not of much use for irrigation of the uplands and the Adivasi peasantry devised various means to counter the problem of water shortage. 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. Small, temporary embankments were constructed across the bed of a stream which allowed water to be stored high up

on the slopes. These were useful in years of average rainfall, yet being dependent on rainfall, they could not be relied upon to prevent food shortage. The worship rituals of the Adivasis and their propitiation of mountain gods demonstrate their very real anxiety concerning annual rainfall. Together with settled cultivation, Adivasi communities also practiced various forms of shifting cultivation in the upland forested areas. Since it was based on a relatively backward technology, shifting cultivation was unsuited for intensive farming and usually inferior grains were grown in this manner. Smaller communities, living in more inhospitable areas, combined shifting cultivation with food gathering, hunting, and trade of forest produce.

Since pre-colonial times, the economy of the Adivasis was characterised by the interdependence between forest and agriculture. Food gathering and hunting were integrated with various forms of cultivation and as a result, Adivasi areas had been less susceptible to famines and food shortages. This interdependence was therefore central to their socio-economic life as it enabled a livelihood, which, although precarious, could ensure subsistence in the context of low population density.

Sedentarisation of the Adivasis was a significant change that occurred during the colonial period, particularly for larger communities; this was effected through curbs on shifting cultivation and through control over their intra-district migration. Till the mid-19<sup>th</sup> century, the colonial rulers had laid greater emphasis on clearing forest for cultivation and extension of cultivation was noted in almost all the districts controlled both by indigenous landlords and the colonial government. The extension of the agrarian frontier was accomplished both through the reclamation of new land as well as through the cultivation of wastelands. With the increase of population, a process of intensification of cultivation occurred whereby uplands were gradually embanked and converted to rice lands. As a result, the hardy upland cereals were replaced by wet rice cultivation. 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. By the end of the 19<sup>th</sup> century, rice had become by far the most important food crop in Chotanagpur.

The intensification of agriculture in the uplands was accompanied by restricted access to forests, starting in the last two decades of the nineteenth 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 indigenous people. The need to reserve forest was motivated by the enormously inflated demand for timber at the time, created by the advent of railways. While forests were restricted for the local people, they were commercialized on a massive scale in the interests of enabling sustained timber production. Since these forests lay in mineral-rich zones, the opening of mines further limited access to the forests. Restrictions on the use of forests also affected the traditional agricultural practices of the Adivasis as large areas of upland, usually used for growing hardy crops, were placed out of reach of ordinary cultivators. British rule thus brought about the separation of forest and cultivation, bringing an end to their complementarity in the Adivasi economy. The net result was an increasing incidence of famines under colonial rule. Severe droughts in the first half of the 19<sup>th</sup> century had not caused famines or high mortality as the Adivasi subsistence economy could draw sustenance from forest produce. However, from the mid-19<sup>th</sup> century, famine and hunger became endemic in Chotanagpur.

The gradual spread of rice cultivation in the nineteenth century together with the state's exploitation of forest and mineral resources thus reshaped the landscape significantly during the colonial period. Against this background, we see the emergence of new diseases as well as the development of medical surveillance systems.

## **Environment and Disease in Chotanagpur<sup>6</sup>**

British writings of the 19<sup>th</sup> century gives an account of the diseases which were to be 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. The cooler climate on the uplands, especially in winter, was more akin to that in Britain; it was in the plateau that English officers could find some respite from the relentless heat and oppressive

humidity of the Indian plains – and the unpleasantly hot summers held forth the threat of disease and death. As the link between disease, climate and landscape came to be established in the European scientific discourse of the mid-19th century, the causal relationship between health and environment became a common trait in the narratives on Chotanagpur. For instance, it was reported that the district of Singhbhum, located in the south-western part of Chotanagpur was annually ‘scourged by cholera, fevers and smallpox’.<sup>7</sup> British writers, however, attributed the virulent spread of smallpox during the mid-19th century to ‘outsider inoculators’ – i.e. outsiders who flocked into the region following British conquest – rather than being a natural phenomenon of the district.

Less spectacular than smallpox, but a more potent killer were the dreaded ‘jungle fevers’ of the region. The geologist Valentine Ball, who carried out a geological survey of the region in the mid-19th century, succumbed to these from time to time despite taking all preventive measures.<sup>8</sup> The indigenous people of Chotanagpur, i.e. the Adivasis, were observed to have been relatively free from disease. This was explained both in terms of their resistance to disease, as well as to the precautionary measures they took in building small, scattered villages and fleeing to the jungles to live apart from each other at the first appearance of any epidemic.<sup>9</sup>

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. Captain W.S. Sherwill, a surveyor in the Santal Parganas, had similarly noted that ‘the hillmen’ (i.e. the Paharias) and the Santals appeared to suffer little from this fever. However,

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’.<sup>10</sup>

With the recurrence of famines, starvation became endemic, a relatively new phenomenon resulting from the restricted access to forests for the Adivasis. As a result, they became more and more debilitated and vulnerable to epidemics.



The shift to rice cultivation during the 19<sup>th</sup> century and restrictions on hunting also had the effect of changing the diet of the people. Forest-based produce which supplemented their diets was no longer freely available. This forced the Adivasis to turn to the consumption of grain, leading to widespread hunger whenever the rice crop failed. Deprived of an essential part of their diets, Adivasis succumbed easily to disease, including maladies such as malaria, to which formerly they had developed some degree of resistance. Denudation of the hills and forests, along with the digging of mines, destroyed the ecological balance. As Ford Foundation records reveal, environmental pollution, together with overcrowding in the mining towns, resulted in many previously unknown diseases. Poor health and frequent epidemics weakened both the Adivasi and the non-Adivasi population. But the effect was greater among the Adivasis, who tended to avoid modern medical facilities, both because of the expense and also because of their deep-rooted cultural beliefs.

The construction of the Bengal Nagpur Railway running across the forests of Chotanagpur, which facilitated the influx of non-Adivasi peasantry and labourers, greatly exacerbated the outbreak of malaria in the region. As Paul Russell, an officer of the Rockefeller Foundation International Health Division noted, its route map, when superimposed on Christopher's malaria map of India, revealed that considerable portions of these lines ran through highly malarial country.<sup>11</sup> Around 25 species of anopheline mosquitoes had been traced along the Bengal Nagpur Railway. In the 1930s, the railway had employed a full-time malariologist to tackle the problem and 25 distinct control projects were set up at stations along the rail line. The control work, which was done as anti-larval campaigns, 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 which considered it to be part of its business expense.

The breeding grounds along the railway tracks included *nullahs*, paddy fields, sunlit pools, wells, sluggish streams, irrigation channels and also seepage. Wet fallow paddy fields with clear water were a menace, while paddy fields with muddy waters were less dangerous. Thus, in areas where the cattle were strong enough to plough the hard dry fields prior to planting just before the rains were not sites where the larva could breed. There, rain water became muddy thanks to 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, mosquito breeding occurred among the tops of the straw at the surface of the water. This study clearly revealed how the shift to wet paddy cultivation led to increased incidence of malaria, as *A. culicifacies* breeds well in such conditions. As a later report of a Rockefeller Foundation mission to India in 1957 showed, *A. culicifacies* was, in fact, one of the most important vectors in this region and responsible for 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 extends from August to December.<sup>12</sup>

Although R. Senior-White, the malariologist of Bengal Nagpur Railway, recommended a thorough study of the rice field problem in India, the problem of shortage of funds hampered research. Russell therefore recommended that both commercial organisations as well as governmental departments, in particular, the Forest Department, should collaborate to devise a method primarily directed towards improving agriculture. Such a plan, in turn, would then indirectly control malaria by destroying the breeding grounds.<sup>13</sup>

Some of the post-Independence developmental schemes involving environmental management undertaken by the Government of India had long-term implications for health and the 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. 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). It also had a barrage and a network of canals (2494 km), which naturally brought the focus back to malaria control. S.N. Mozumdar, the Chairman of the Damodar Valley Corporation, met E.L. Bishop of the Tennessee Valley Authority (TVA) on 10 February 1950 to discuss methods of malaria control on impounded

waters. Bishop impressed on the fundamental necessity of planning malaria control methods before impoundage of water, to ensure the effectiveness and economy of these measures. He also emphasized the basic importance of water level management.<sup>14</sup>

The surveys of malaria prevalence in the Damodar Valley showed that malaria tended to vary in different parts of the project area, reflecting the 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.<sup>15</sup> R.B. Watson, an officer of the International Health Division of the Rockefeller Foundation, pointed out that Indian irrigation and hydro-electric projects seldom included considerations of public health hazards in their overall project planning.<sup>16</sup> Fearing their inability to convince the DVC to organize proper health services, including malaria control work, some of the members of the DVC Board requested Watson to intervene and send a report on the matter. Watson visited the dam sites at Konar, Tilaiya and Maithon, inspected the medical care and health services provided, and also met with key personnel at these sites and at Hazaribagh. He concluded that the DVC had serious malaria problems associated with its operations and hence was obliged to undertake measures to prevent an increase of malaria in the Damodar Valley as a result of its operations.<sup>17</sup> The climate of the valley was such that development of the malaria parasites in mosquitoes was possible any time of the year. Watson identified three probable effects of the operations of the corporation: malaria among employees at the dam sites and other projects, malaria among the indigenous population directly associated with impounding of water, and malaria in populations associated with irrigation projects of the corporation. He also noted that malaria control operations of the DVC were at the time confined to employees at various dam sites. Watson outlined the necessity of organizing a detailed Malaria Control Programme for the Damodar Valley and suggested encouraging legislation which obliged the DVC to perform such activities.<sup>18</sup>

While malaria had been a recurrent problem, with varied 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 also in the neighbouring regions, where around 893 people were afflicted by an unknown fever.<sup>19</sup> 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 4 ½ 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 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.

Preventive measures taken included an immediate control of the arthropod population through the use of DDT and gammexane. Clinical and epidemiological information was collected not only from the patients who had been admitted in the hospital, but also from those who were not hospitalized. 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.<sup>20</sup> The outbreak occurred at a time when rainfall was poor and humidity lower than in previous years. However, it is difficult to ascertain whether the climatic factors had any specific role in the outbreak of encephalitis.

There was also some doubt as to whether the disease was entirely new to the region or not. According to Lt. Col. K. Najib Khan, the Chief Physician of Tata Main Hospital, the disease was a new entity which he had not previously encountered. The investigation into the disease was carried out by Dr. J. Austin Kerr of the Rockefeller Foundation Virus Research Centre in Poona which revealed certain anomalies.<sup>21</sup> For instance, in the two old and congested areas of Jamshedpur, Bistupur and Sakchi, it was seen that in spite of high incidence, fatality was rare. 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.

## The Role of the Rockefeller Foundation in Creating Rural Awareness

The need for the spread of awareness regarding everyday hygiene was an important issue in which the Rockefeller Foundation historically played a seminal role. Since the second decade of the 20<sup>th</sup> century, the International Health Board (later, the International Health Division of the RF) had assisted the Government of Bengal in organizing public awareness programmes and providing materials such leaflets, charts etc. to raise public consciousness. The Rockefeller Foundation had also produced specific films on public health care. Particularly useful was the film *Unhooking the Hookworm*, which emphasized steps to prevent hookworms, an essential treatment for Indian labourers who, as migrants, were believed to be spreading the infection throughout the world.<sup>22</sup> Other films dealt with malaria and were produced in languages specific to a region. Thus the film *How to Live Long and Well* was shown in Travancore in South India with Tamil and Malayalam sub-titles.<sup>23</sup> Later in the 1930s, the Rockefeller Foundation played an advisory role in the village health programme that started in Sriniketan, a town in Bolpur (the easternmost part of the area of my research), by Rabindranath Tagore and his two associates, Leonard Elmhirst and Harry G. Timbres. Timbres was keen to carry out some of the cooperative ideas which he had examined in Yugoslavia, a principle which he felt was of greater import than cheap medicines and availability of doctors. He wrote:

It is a self-evident fact that much of the poverty in the Indian village could be ameliorated if the villager would learn the secret of cooperation with his neighbour. The phenomenal growth of economic cooperatives in India during the last quarter century shows that the villager is learning this lesson. He is learning that by cooperative means he can improve his condition in many ways not possible for him as an individual. Then why not teach him to purchase good health the same way!<sup>24</sup>

Good health, he declared, meant education, sanitation and application of measures aimed at preventing disease. The villager, as an individual, could not do this, but as a group could carry out all these measures. Another of Tagore's associates, Leonard Elmhirst, had important links with the Rockefeller Foundation and was keen to enlist its help in the region's malaria eradication

programme. However, the IHB entered the field only upon government invitation and worked only in connection with governmental agencies which was ultimately responsible for the health of a country.<sup>25</sup>

How did people respond to the changes in their environment and to the diseases to which they were exposed? This is a crucial question which I address in my larger research project and in tracing this, the reports of various projects funded by the Ford Foundation have been of great importance. The Ford Foundation had funded several projects which studied various aspects of Adivasi culture and in particular emphasized the significance of the forest in their everyday life and in their health practices.<sup>26</sup> These reports reveal a complex situation where Adivasis show various contradictory responses to modern medicines. While a belief in traditional medicine continues to exist, their access to modern medical facilities is seriously hampered. These reports also demonstrate how Adivasi knowledge, especially of traditional herbs, had been systematically dismissed by non-Adivasis as belonging to the realms of superstition. Similarly, the Adivasi were scorned for their belief system which prioritizes the role of the *bongas* (spirits) in causing disease and epidemics. Yet, over the years, the simple health precautions that they traditionally practised, for instance of living apart from one another at the outbreak of any virulent disease, had to be abandoned in view of constant encroachments on their land by outsiders.

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<sup>1</sup> P.J. Crutzen and E.F. Stoermer (2000), "The Anthropocene," *Global Change Newsletter*, 41 (17).

<sup>2</sup> Linda Nash (2006), *Inescapable Ecologies: A History of Environment, Disease and Knowledge*, Berkeley and Los Angeles: University of California Press, p. 16.

<sup>3</sup> Some of the exceptional research in this field includes that of David Hardiman (2008), *Missionaries and their Medicine: A Christian Modernity for Tribal India*, Manchester: Manchester University Press and David Arnold (2012), '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.

<sup>4</sup> Published as a monograph entitled *Adivasis and the Raj: Socio-economic Transition of the Hos, 1820-1932*, Delhi: Orient Blackswan, 2011.

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<sup>5</sup> For details, see Sanjukta Das Gupta (2014), “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; Sanjukta Das Gupta (2009), “Accessing Nature: Agrarian Change, Forest Laws and their Impact on an Adivasi Economy in Colonial India”, *Conservation & Society*, 7(4).

<sup>6</sup> By ‘Chotanagpur’ I include not only the districts in the Indian state of Jharkhand, but also the eastern vestiges of the Chotanapur plateau in the districts of Birbhum, Purulia and West Midnapur in the state of West Bengal.

<sup>7</sup> S.R. Tickell (1840), ‘Memoir of Hodisum’, *Journal of the Royal Asiatic Society of Bengal*, Vol. 9, Part 2, p. 706.

<sup>8</sup> Valentine Ball (1880), *Jungle Life in India or the Journeys and Journals of an Indian Geologist*, London: Thomas De La Rue & Co, p. x.

<sup>9</sup> Tickell, op.cit., p. 706.

<sup>10</sup> Walter S. Sherwill (1851), ‘Notes Upon a Tour through the Rajmahal Hills’, *Journal of the Asiatic Society of Bengal*, Vol 20, p. 549.

<sup>11</sup> ‘Reports of Malaria Tours in India, 1934-35,’ RF, RG 1.1, Series 464, FA 386b, Box 11, Folder RUS 7, RAC.

<sup>12</sup> ‘Report on Mission to India’, RF, RG 1.2, Series 464, FA 387b, Box 72, RAC.

<sup>13</sup> Russell’s Confidential Report, RF, RG 1.1, Series 464, FA 386b, Box 11, Folder RUS 7, RAC.

<sup>14</sup> E.L. Bishop to R.B. Watson, 15 February 1950, RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, RAC.

<sup>15</sup> ‘Notes on the Development of Malaria Studies and Control Programme, DVC’, RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, RAC.

<sup>16</sup> R.B. Watson to E.L. Bishop, 27 March 1950, RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, RAC.

<sup>17</sup> 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, RAC.

<sup>18</sup> ‘Notes on the Development of Malaria Studies and Control Programme, DVC’, RF, RG 2, Series 1950/464, FA 759, Box 498, Folder 3336, RAC.

<sup>19</sup> ‘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, RAC.

<sup>20</sup> 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, RAC.

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<sup>21</sup> J. Austin Kerr to K.S. Master, 20 September 1954, RF, RG 6, SG 7, Series 113, FA 396, Box 146, Folder 1065, RAC.

<sup>22</sup> RF, RG 5, IHB/D, Series 1, Subseries 2, Box 232, Folder 2963, RAC.

<sup>23</sup> RF, RG2, 1936, Series: Publications, Subseries 464, Box 138, Folder 1030, RAC.

<sup>24</sup> 'A Village Health Programme', May 1932, RF, RG 2, 1924-1939, Series 1932/466, FA 308, Box 74, Folder 598, RAC.

<sup>25</sup> Victor G. Heiser to L.K. Elmhirst, 6 August 1923, RF, RG 5, Series 1.2, Subseries 464, Box 171, Folder 2203, RAC.

<sup>26</sup> For instance, see 'Report of the Indian National Trust for the Welfare of Tribals', FF, Grants S-Thel (FA 732G), Reel 8996; 'Report of the Society for Rural, Urban and Tribal Initiatives', FF, Grants S-Thel (FA732G), Reel 6601; 'Report of the Ranchi Consortium for Community Forestry', FF, Grants O-R (FA 732F), Series Ford Foundation Grants O-R, Reel 5231; 'Report of the Karree Society for Rural Action', FF, Grants H-K (FA 732D), Reel 8969, RAC.