

# From physiograms to cosmograms: Daktar Binodbihari Ray Kabiraj and the metaphoric of the nineteenth-century Ayurvedic body

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To be modern, in its most fundamental sense, is to be distinct from the past (if not actually opposed to it) and to be an inalienable part of the present. To call something 'traditional' is therefore to deny it a rightful place in the present: to reduce it to an exotic anachronism. Johannes Fabian has described the anthropological trope of 'primitiveness' as a 'denial of coevalness' by which people and institutions – the anthropologist and her subject who are very obviously contemporary to each other – are split up and rendered within their own discrete temporal envelopes.<sup>1</sup> This is largely the case when we speak of 'traditional medicine'. Therapeutic practices that are labelled 'traditional' are marked off as leftovers from a bygone era.

A 2012 report by the World Health Organization, however, confirmed that over 115 countries in the world, including such demographic giants as China, India, South Africa, and Nigeria – to name but four – now have official policies for 'traditional medicine'.<sup>2</sup> To varying extents, all these countries have carved out officially recognised spaces for various so-called 'traditional medicines' within their state health systems, albeit often at a level subordinate to biomedicine. The nomenclature notwithstanding, these allegedly 'traditional medicines' do share the contemporary present with biomedicine and have done so for some time now. Yet it is partly by their continued framing as 'traditional' that their official subordination to biomedicine and their frequent erasure from scholarly overviews of the medical present is ensured.

Nowhere is this refusal of coevalness more conspicuous today than in overviews of the history of medicine. A 2008 work entitled *Medicine and Modernism*, for instance, has this to say about the conundrum of the modern: “Modernity” and “modernization” are terms that historians use to refer to the interrelated series of economic, social, and political transformations that occurred in western societies during the period of the long nineteenth century. Urbanization, industrialization, and the spread of market capitalism were among the most salient features of these changes.<sup>3</sup> Both modernity and modernisation are thus made synonymous with ‘western societies’. A place like South Asia, though intimately connected to the developments in Britain and thus equally implicated in the dynamics of urbanisation, industrialisation, and the spread of market capitalism (though in different ways and at distinct rates), is yet expunged from the ambit of nineteenth-century modernity. In the same year that L. S. Jacyna wrote the above lines, William Bynum published *The History of Medicine: A Very Short Introduction*. Despite having deployed the definitive article in the title, and thus foreclosing any possibility of there being *Other Histories of Medicines*, Bynum’s account remained firmly focused on the story of biomedicine. Even in his final chapter, entitled ‘Medicine in the Modern World’, the possibility of the ‘modern world’ being inhabited by anything but biomedicine is never allowed to interrupt the narrative.<sup>4</sup> A few years later, in 2011, Roger Cooter contributed a fascinating chapter entitled ‘Medicine and Modernity’ in an *Oxford Handbook of the History of Medicine*. Once again, notwithstanding Cooter’s careful attention to how actors themselves used the notion of modernity and his just insistence that ‘not only the history of medicine, but the history of modern thought depends upon an understanding of modernity in medicine and medicine in modernity’, he completely eschews the possibility of their being *other modernities and other medicines*.<sup>5</sup>

I cite these authors not to single them out as somehow exceptionally blameworthy. Rather, I cite them for the exact opposite reasons. They are all eminent historians of medicine – amongst the very best in the field in fact – known for their archival rigour and their theoretical sophistication. Yet, and here’s the rub, they seem entirely unaware of the debate over multiple modernities. The latter debate is now close to two decades old and in many circles it is already a *fait accompli*; but alas, not in medical history circles.

The watershed moment for the debate over multiple modernities came in 2000 when S. N. Eisenstadt edited a special issue of the journal *Daedalus* on the subject.<sup>6</sup> The contributors to the *Daedalus* volume described many different types of modernity ranging through Israeli, Turkish, Confucian, Islamic, Indian, Diasporic, Communist, and many more. Even before the *Daedalus* issue, however, postcolonial scholars such as Partha Chatterjee had made a powerful case about the fractured and plural nature of modernity.<sup>7</sup> In fact, Chatterjee's entry point into the question had been precisely through the actor's category of '*adhunikata*' or 'modernity' amongst nineteenth-century Bengali intellectuals. Along similar lines and more recently, Dipesh Chakrabarty has called for the 'provincializing' of European modernity.<sup>8</sup>

The argument I want to pursue here, however, is not merely that there are many medical modernities. Of course there are and the introduction to this volume does a splendid job in underlining that modernity is 'a constantly changing accretion of history, social context, and material conditions'. What I want to add here in this chapter is a recognition that just as there are many modernities, so too are there many medicines. Western, or biomedicine, is not the only form of 'medicine' that confronted, negotiated, or developed its own figure of modernity. Neither did all non-Western forms of medicine simply oppose modernity. Yet these *parallel medical modernities* continue unfortunately to be largely ignored within mainstream histories of medicine.

My ambition in this chapter, therefore, is to pursue the history of a specifically Ayurvedic medical modernity.<sup>9</sup> I do not wish to claim that Ayurvedic modernity was the only South Asian medical modernity. There were certainly both Western-style biomedical forms of modernity and vernacularised South Asian versions.<sup>10</sup> There were also other medical modernities engendered in and organised around other medical traditions such as Unani Tibb, Siddha, and Sowa Rigpa, to name only the most prominent ones.<sup>11</sup> Each of these medical modernities had their own specific accents, politics, and, above all, their distinctive body imaginaries. They were each shaped by their own historically specific trysts with what the practitioners themselves conceptualised as modernity. Each of these merits a devoted historical exploration. But in the present chapter, I shall focus exclusively on the Ayurvedic tradition, which has today emerged as not only the largest and best funded non-biomedical tradition in South Asia, but also as a global therapeutic

option available in each of the major continents.<sup>12</sup> Moreover, my window into this Ayurvedic modernity will be the nineteenth-century Ayurvedic body.

In the interests of space, I have developed my account of Ayurvedic modernity through a discussion of the writings of one particular Ayurvedic author, Binodbihari Ray (1862–?). After a brief review of the extant literature on Asian medicines and modernity, I demonstrate how Ray developed an explicit and self-conscious discourse about Ayurvedic modernity. I follow this up with a more detailed interrogation of his descriptions of the Ayurvedic body and show how, through the use of metaphors, he radically refigured the Ayurvedic body. Finally, after another brief excursus contextualising the metaphors themselves, I conclude with a section on Ray's later cosmological writings and their relationship with his medical writings.

### Binodbihari Ray and Ayurvedic modernity

Not a whole lot is known about Binodbihari Ray. He was born around 1862 and in his youth, he trained in Western-style medicine and eventually earned a VLMS (Vernacular Licentiate of Medicine & Surgery) diploma. Unfortunately, there is no record of his subsequent professional life. In January 1890, he launched a short-lived medical journal. At the time he was based in Talanda, Rajshahi, in present-day north Bangladesh. He also claimed to have run into huge debt to finance the publication. Very few issues of this journal have survived, suggesting that it probably did not last very long (though we cannot be sure of this). We next hear of him in 1908 when he published a lengthy book on Ayurveda written entirely in verse titled *Podyo Ayurbbed Siksha* ('Medical Educational Verses'). Also interestingly, while in 1890 he had described himself simply as a *Daktar*, that is, the vernacularised form of address for a Western-style physician, in 1908 he styled himself as 'Daktar Binodbihari Ray Kabiraj' (Kabiraj being the designation used to refer to Ayurvedic physicians).

In 1908, the same year that he published his last medical writing, Ray published his first cosmological work. In the years to come he went on to publish three more erudite cosmological works devoted to the theme of 'creation-existence-apocalypse' (*srishti-sthiti-pralay*). In none of the books did he refer to his life as a doctor, nor use addresses like *daktar*

and *kabiraj*. Had it not been for his penchant for publishing photographs of himself in his books along with his birth year and his address in Rajshahi, there would be no way of knowing that the medical author and the cosmological author were one and the same person. Why he made such a clean and absolute break with his medical identity – at least in print – remains a mystery, as do the precise connections between his medical and his cosmological writings. These scant details are sadly the sum total of our knowledge about Ray's life.

We can add a little more to this by contextualising the sparse information we do possess. For instance, the VLMS diploma was a special qualification introduced in 1851 to cater to the colonial state's growing medical needs. The course followed for this diploma was shorter than the five years necessary for both the Bachelor of Medicine (MB) and the Licentiate of Medicine & Surgery (LMS) qualifications. Moreover, knowledge of English was unnecessary for the VLMS. Two separate classes of VLMS students were taught respectively in Hindustani and Bengali. Ray almost certainly read in the Bengali class. After a three-year truncated course, this would have rendered him eligible for appointment as either a Hospital Assistant or in one of the growing number of dispensaries under full or partial state funding. If Ray attended medical school in Calcutta, he would have attended classes at the Campbell Medical School in Sealdah where the Bengali class used to be held. There is, however, also a chance that he may have attended classes at the Dhaka Medical School that also offered VLMS diplomas from 1874 onwards.<sup>13</sup>

What we lack in circumstantial details for Ray is compensated by his own powerful voice. In explaining his decision to launch his short-lived medical journal, *Chikitshak* ('Physician'), Ray explained that 'Ayurveda, our national therapeutics' (*amader deshiya chikitsa byabostha*) had fallen on very bad times. 'Leave alone foreigners', he lamented, 'even our countrymen detest it and demean it by labelling it unscientific (*abaigyanik*)'.<sup>14</sup> Many 'great souls', he admitted, had already taken up the cudgels for Ayurveda and many Kabirajes too were making strenuous efforts to reverse the situation, but given the dire situation it was in, according to Ray, the 'help of locals trained as *daktars* was indispensable'. The likelihood of this happening, however, was remote. Many a local, Ray accused, began to hate Ayurveda the moment they entered through the gates of the Medical College. Yet he insisted that

it was the 'beholden duty' of every *daktar* to labour for the revival of Ayurveda.<sup>15</sup>

Not one to be satisfied with abstract statements, Ray also had a clear plan for what needed to be done. He insisted that one of the foremost tasks was to publish more Ayurvedic journals. He lamented that one of the earliest journals, *Ayurveda Sanjeevani*, had proved short-lived and another, *Chikitsha Sammilani*, while faring better was often irregular and dependent on the magnanimity of a single generous aristocratic patron. The bigger aim, however, was 'to explain the complexities of Ayurveda and make it easily accessible, to elaborate on those issues that are only briefly mentioned in Ayurveda, to search for and to incorporate from other therapeutic traditions what is missing in Ayurveda.'<sup>16</sup>

In explaining this further, Ray mentioned that medicine is 'improving day by day' (*din din unnati hoitechhe*) and newer things are being discovered. None of this was there in the 'olden days that is in the days of the Aryans' (*purbakale arthat Arjyaganer samay*).<sup>17</sup> This is clearly a framing in terms of modernity by positing a clear break with an 'older time' of tradition. Ray's espousal of a classical time identified with ancestral 'Aryans', was fairly widespread amongst late nineteenth-century Indian, especially high-caste Hindu, intellectuals.<sup>18</sup> But unlike many others, Ray did not see the present as merely a degeneration of that classical, Aryan antiquity. Rather, the contemporary moment was for him marked by 'improvements' (*unnati*) and new discoveries (*abishkar*) that necessitated new efforts within the specific realm of Ayurvedic medicine.

Ray further suggested that some of the things that were being discovered were already there in Ayurveda but perhaps in complex, difficult-to-comprehend forms or indeed too briefly. He would elaborate on these and demonstrate that what appeared new was after all not so new, and already there in Ayurveda. But there were also things that were simply absent in Ayurveda. Ray confessed, for instance, that biomedical diagnosis (*nidan*) was much superior to Ayurveda, just as anatomy (*shaarir*) and physiology (*sharirkriya*) were weak in Ayurveda. Though he hastened to add that this was not a grievous fault since Ayurvedic diagnosis and therapeutics were not as heavily dependent on a thorough knowledge of anatomy and physiology as biomedicine was, the confession of a lack was telling.<sup>19</sup> It was particularly significant because

he followed up this particular discussion with an entire serialised essay on physiology. Clearly, he was seeking to fill the gap here as he had promised to do in setting up the goals of his project.<sup>20</sup>

Ray's attitude towards modernity was further clarified when he intervened in a debate that had been taking place on the pages of another Ayurvedic journal, the *Chikitsa Sammilani* ('Meeting of Medicines'). The debate had originally involved a Bengali *daktar*, Pulinbihari Sanyal, and a Kabiraj, Prasannachandra Maitreya, and their respective definitions of the Ayurvedic notion of '*dhatu*'. Maitreya was opposed to Sanyal's attempts to interpret Ayurvedic concepts along biomedical lines and at one point had asserted that *pitta* (one of the key pathogenic principles in Ayurveda) was actually the 'Lord Brahma himself'. Ray summarised the debate in the *Chikitsak* and retorted that, 'if there is no other way of describing *pitta*, then Mr Maitreya's utterances are like the hollow boast of a child, for in the nineteenth century if we were to simply call *pitta* the god Brahma and left it at that, no one would accept it.'<sup>21</sup> Once more, in this exchange, we are given a clear sense in which Ray was thinking of his project as a modern project. His argument was a temporal one based on the attitudes of people in 'the nineteenth century'. People would not accept Maitreya's statement because it was incompatible with nineteenth-century horizons of belief and plausibility.

This horizon of plausibility seemed to be firmly linked, at least for Ray, to the idea of demonstrability. In every issue of his journal, he explained anatomical and physiological concepts by describing simple, do-it-yourself experiments or giving directions about the dissection of goats. One series of do-at-home experiments, for instance, was aimed at explaining to readers the chemical composition of the air and involved simple tools like candles, glasses, etc.<sup>22</sup> In another similar series of experiments, he demonstrated the chemical explanation for combustion.<sup>23</sup> Likewise, he advised readers to dissect a goat and conduct an experiment by blowing into the dead goat's trachea through a rubber tube and following the movements of the air.<sup>24</sup> Another similar demonstration involved dissecting the goat's stomach and examining the flexibility of the diaphragm by various simple experiments.<sup>25</sup>

As Steven Shapin and Simon Schaffer point out in their classical history of 'experimental life', there emerged towards the end of the seventeenth century in Britain a new paradigm of experimental knowledge,

which generated 'moral certainty' around 'matters of fact'. The production of such experimental knowledge 'commenced with individuals' acts of seeing and believing, and was completed when all individuals voluntarily agreed with one another about what had been seen and ought to be believed.<sup>26</sup> There were, therefore, two key moves involved in the production of such experimental knowledge. First, a faith that 'seeing is believing' and second, a consensus that everyone is seeing the same thing. The generation of this consensus, in turn, was premised upon the disciplining of the experimental community, that is the standardisation of the experiment itself as well as the ways of seeing. When 'Western' science and its oculo-centric ways of knowing were disseminated, therefore, it was not simply visual demonstration that was privileged. The eye of the seeing subject or experimentalist was also carefully trained and guided. Shigehisa Kuriyama's fascinating account of anatomical viewing amongst Japanese doctors amply illustrates that what distinguished older and new forms of anatomical knowledge in Japan was not so much cadaveric dissections per se, but rather what the dissector observed.<sup>27</sup> I would argue that Ray's detailed descriptions of do-at-home experiments were, in essence, attempts to disseminate a culture of visually anchored knowledge based upon standardised ways of seeing.

This experimental imperative, not to mention the actual experiments and demonstrations being recommended, was utterly new to Ayurveda but it seemed to be at the heart of the attitude that Ray thought necessary for the nineteenth century.<sup>28</sup> Ray was attempting not only to establish a novel, experimental basis of Ayurvedic knowledge, but also to create a community of experimentalists in the process. In an interesting early essay, Ray framed his new curiosity and quest for visual proof in terms of a generational difference in orientation. Structured as a dialogue between Ray and his aged grandfather around the chemical explanation of combustion, Ray repeatedly depicted his grandfather as lacking the curiosity to ask further questions. The grandfather seemed happy with the simple fact that the lamp stops burning when the oil runs dry, but deemed it foolish to ask why this should happen. Ray, on the other hand, urged his grandfather to ask more questions, while the latter feared that Ray was losing his mind. At one point in the exchange, the eponymous grandfather asked how Ray proposed to answer such absurd questions. Ray replied, 'We will ask nature (*prakriti*): Suitably

taken aback, the grandfather asked again, 'And where will you find her?' 'I shall bring her here, into this room,' explained Ray.<sup>29</sup>

There were a series of assumptions here about 'nature' as a discrete, rule-bound entity, about the ability to probe this 'nature' by way of experimentation, and of course, the alleged transparency of the meaning of these experiments. Carolyn Merchant argues that though the European idea of 'nature' as a discrete, frequently feminised, entity had roots in classical antiquity, it underwent one of the several crucial mutations at the end of the nineteenth century. An idea of 'nature' based on pure, idealised Forms, at this time, began to give way to a more 'materialist, process-oriented perspective'.<sup>30</sup> Whereas the idealised Forms derived their perfection from the Supreme Deity, the new natural laws were immanent in the regularity of the materialist world of nature. Rather than being plainly visible, they had to be made visible. Ray's dialogues sought to import this new, process-oriented, materialist nature into Ayurvedic thinking. By deploying the word *prakriti*, however, he also sought to braid this new idea of 'nature' with older notions of the cosmos available in Indic philosophies.

Being sensitive to this explicit recalibration of 'nature' by Ray is particularly important in view of Eduardo Viveiros de Castro's recent call to replace 'multi-culturalist' analysis – where nature remains ahistorical and universal and yet defined exclusively by the modern West – with a robust 'multi-naturalism' that acknowledges the different, historically specific ways in which people across the globe mobilised a sense of 'nature'.<sup>31</sup> As Ray made it clear through his trope of generational conflict, his 'nature' was a new one. It was this new 'nature' and its practical enactment that was constitutive of the modern present of the nineteenth century. Ray and his grandfather were clearly reified tropes standing in for 'tradition' and 'modernity', which, in turn, were themselves undergirded by distinct notions of the natural.

These themes were further elaborated in an essay Ray wrote in the third year of his journal *Chikitshak* on the scientificity of Ayurveda.<sup>32</sup> He mocked those who declared that Ayurveda was unscientific by saying that, when the ancient Aryan seers had composed the fundamentals of Ayurveda, those who now boast of science and claim to teach it to others (i.e. the British) had not even learnt to build the foundations of houses. The wisdom of such antiquity, he urged, ought not to be thrown away without some consideration. Notwithstanding

the rhetorical broadside against the British, Ray's plea for the respect of tradition seemed almost to be in the vein of asking for some consideration for an aged grandfather.

This was not all. Having thus pleaded for age being given its due respect, he then advanced a more systematic case for considering Ayurveda to be scientific. He asserted that anyone with a truly scientific mind investigates everything before passing judgement. Thus Newton, he argued, had been able to connect the falling of the fruit with gravity because he was both observant and possessed an inquiring mind. Upon investigation, he further declared that medicine is universally focused upon six objects: 1) place (in the sense of soil); 2) time (in the sense of seasons); 3) patient (in the sense of constitutions); 4) materia medica; 5) air; and 6) water.

Ray's proposal of this six-fold classification bears some clarification. It seems to superficially resemble the robust Hippocratic tradition of *Airs, Waters, and Places*.<sup>33</sup> Here, it is also worth recalling that such an 'ecological theme' was also available in classical Ayurvedic texts.<sup>34</sup> What Ray was saying, however, was quite distinct from both of these. Summing up the Hippocratic tradition, at least in its medieval and early modern form in Europe, Andrew Wear points out that, a 'central assumption in *Airs, Waters, Places* is that there is a causal connection between a place, including its climate, season, water, and food, and the people born into it.'<sup>35</sup> Ray, by contrast, neither posits a fixed causal connection between place and the temperament, nor indeed does he insist that native-born people are the only ones whose health is shaped by their milieu. Ray's point was simply that medicine universally has six objects of enquiry.

Moreover, the link that connected all these six objects of medicine, according to Ray, was the Ayurvedic *doshas*. In subsequent sections we shall see why *doshas* are distinct from the Hippocratic notion of humours. This, in turn, will introduce another level of distinction between the superficially similar *Airs, Waters, Places* tradition and Ray's position. Though, here again, it is worth pointing out that Ray's version of the *doshas* was not identical to the classical *doshas* found in Sanskrit texts. Ray in fact, glossed his description of the three *doshas* as 'nervous influence' or 'electricity', 'body heat', and 'lymph'. This is again something I shall discuss more fully later, but for now it is worth noting the distinctive idea of *doshas*, transcreated by braiding together classical

Ayurvedic definitions with concepts such as electricity drawn from the nineteenth-century 'Western' scientific tradition.

Ray's argument, therefore, had two basic propositions. First, that medicine everywhere was defined by its attention to six objects of study, and Ayurveda did in fact focus on these six objects. Second, that in order to be scientific, any medical tradition had to explore these six objects systematically through an experimental framework. Again, he argued, Ayurveda had done this for longer than any other therapeutic tradition. Hence, he posited that Ayurveda was eminently scientific. In so doing, of course, he also subtly repositioned Ayurveda itself. He inserted into the Ayurvedic framework a new experimental orientation premised on observation and demonstration and linked it to late Victorian ideas of 'natural laws'. The new 'Ayurvedic nature' that emerged through Ray's braiding of Indic and Western ideas was a distinctive one. Just as it differed from classical Ayurvedic understandings of reality through its emphasis upon the experimental and the demonstrable, as well as its refractions through notions of electricity, lymph etc., it differed also from contemporary Western ideas by insisting on the three *doshas* as the basis of all reality. This latter insistence, in turn, as I will show later, pushed Western notions such as 'lymph' to acquire entirely new meanings as a heat-storing substance immersed in the blood.

### The reticulated body

In 1908, Ray's versified text depicted the Ayurvedic body he had been describing in prose in his journal nearly twenty years earlier. This is what he wrote:

Bayu Pitto Koph name dhatu tin jon,  
 Jibdehe thaki' kore tahare dharon.  
 Tripodi upore jotha thake drobyochoy,  
 Todrup dehoti thake koriya ashroy.  
 Morttyodhame shantiram telegraph jotha,  
 Jei shoktite songbad bohe jotha totha.  
 Temni tarit-shokti ache norodehe,  
 Tahari bayu naam ayurbede kohe.  
 Snayusutro ache dehe tarer soman,  
 Tarit tahate – shanti, kore obosthan.

Mostishko janibe ta'r aphis prodhan,  
 Odhin aphis ache bohu-poriman.  
 Jalsomo dehe snayu royechhe beriya,  
 Tarit tahate ache dehoti dhoriya.  
 Tariter poriman kom beshi hole,  
 Songbader karjyo nahi somobhabe chole.  
 Dehete tarit jodi kom beshi hoye,  
 Karjyobighno ho'ye rog koribe ashroy.  
 Reler koler gari thanda jotokkhon,  
 Mritobot eksthane thake totokkhon.  
 Jol-ognijoge ushno hoibe jokhon,  
 Hoibe shojib dekho kolti tokhon.  
 Ognir obhabe thanda mritosomo ro'be,  
 Shojibota-bhab ta'r kotha cho'le ja'be.  
 Temni manob-deho ushno jotokkhon,  
 Shojib shey deho, shanti, thake totokkhon.  
 Roktomajhe ek drobyo diyachhi rakhiya,  
 Tahatei tap shoda rakhi'chhe dhoriya.  
 Bohiya shey tap rokto shorbottro chhoraye,  
 Tahate ushnota dehe shomobhabe boye.  
 Je drobyo roktete thaki' tap dhori' rakhe,  
 Ayurbbed-mote, shanti, pitto bole ta'ke.<sup>36</sup>

[Vayu, Pitta, Kapha are the names of three people,/ Residing in the  
 bodies of the living they bear it./ Just as objects are placed on a three-  
 legged table/ So the body remains upon them./ Just as on earth, Shan-  
 tiram there is the Telegraph,/ The power that bears news here and there/  
 Similar electric-power is in the human body/ Ayurveda tells us its name  
 is Vayu./ Nerve-threads are in the body akin to wires/ In them, Shanti,  
 resides electricity./ The Brain is its main office, this you ought to know,/  
 There are many subordinate offices./ A web-like nerve encircles the  
 body,/ Electricity in it bears the body./ Should the electricity increase  
 or decrease,/ The work of news does not function smoothly./ So long as  
 the railway engine remains cold,/ It remains stationary like a corpse./  
 When it heats up on adding water and fire,/ See the machine comes alive  
 then./ Lacking fire it remains cold as a corpse,/ Its liveliness will disap-  
 pear./ Likewise so long as the human body is warm,/ It is alive, Shanti,  
 only so long./ I have kept a substance in the blood,/ That is what stores  
 heat at all times./ Flowing in the blood, the heat spreads everywhere,/  
 Thus the body remains uniformly hot./ This, Shanti, is called Pitta in  
 Ayurveda.]

Ray's metaphors were surprisingly stable over the period of nearly two decades between his journal and his versified text. In 1890 he had described the Ayurvedic body along almost identical lines. In the very first issue of his journal he had stated that, 'All our present glory is down to the single theory that the Aryans had discovered long ago in the distant past ... That theory is *vayu*, *pitta*, and *kapha* the three *doshas*'.<sup>37</sup>

Having established the centrality of *vayu*, *pitta*, and *kapha*, he then went on to describe what these three entities were. In living bodies, he explained there was a 'white-coloured bunch of threads'. They emanate from the brain and the spine before branching into numerous branches and sub-branches and covering the entire body. These were called *snayus*.<sup>38</sup> *Vayu* was the 'force' or *shakti* in these thread-like *snayus*. Explaining this mechanism Ray wrote that, 'we notice when a telegraph wire lies on the ground it lacks the power to transmit messages. But when it is connected to an electricity-producing machine, then news can be transmitted by it. That is why we call the telegraph wires things made by electricity-conducting materials and not simply electricity'.<sup>39</sup> Furthermore, 'Just as we have described the *snayus* as the pathway for electricity, so we will dub blood the conductor of heat'.<sup>40</sup> Explaining the importance of body heat, Ray wrote, 'The railway engine runs so long as it is hot, not when it goes cold. Our body is exactly like the railway engine'.<sup>41</sup> The description is almost identical to the one he versified eighteen year later in the 1908 text. In these descriptions heat is *pitta* and it is something akin to, but not identical to, electricity. It is the vital essence in the body.

Laura Otis has pointed out that railways and the telegraphs were frequently used as metaphors that allowed the worlds of physics and physiology to be connected.<sup>42</sup> Here we notice a third partner joining the duo in the form of Ayurveda. These metaphors in Ray's writings functioned to create a three-way connection between physics, physiology, and Ayurveda. Thus not only was electricity rendered as a force within the body, hence bridging the worlds of physics and physiology, but was also aligned with the Ayurvedic idea of *vayu*. Likewise, the heat of physics and the blood of physiology had to further induct the *pitta* of Ayurveda into their tightly knit families.

By thus redefining Ayurvedic ideas in terms of ideas from physics and physiology, a new Ayurvedic body was being crafted. This new body was essentially a reticulated body, crisscrossed throughout by

*snayus* through which *vayu*-electricity and *pitta*-heat submerged in blood were constantly circulated. The newness of this body can only be fully appreciated once we compare it to earlier Ayurvedic bodies.

This is easier said than done. Two initial problems impede any efforts at clear comparison with earlier Ayurvedic bodies. First, Ayurveda is almost unique amongst the classical medical traditions of the world in not having developed a significant tradition of visually representing the body.<sup>43</sup> Second, from what we know about medical education in pre-colonial Bengal (which is the region Ray came from), for centuries – if not millennia – erudite Kabirajes seemed to have studied compilations based on the older canonical texts rather than the canons themselves. These compilations, of which Madhavakara's *Rogavinishchaya* was the best regarded, were organised according to diseases and gave no single crisp definition of the three *doshas*, namely, *vayu*, *pitta*, and *kapha*.<sup>44</sup>

If we look back to the core Ayurvedic canon with these caveats in mind, we find in the *Charaka-samhita*, the oldest and most canonical of Ayurvedic works, multiple, fairly distinctive meanings for each of the three *doshas*. The chapter on *vayu*, for instance, is framed as a conference of sages where different sages offer distinct definitions of *vayu* without contradicting each other. Thus one sage describes *vayu* as 'Rough, light, great, cold, sharp, and elaborate – these are the six normal qualities of Vayu'. A second sage, without in any way contradicting the former, has this to offer: 'The Lord Vayu is the primal cause of creation, the cause for the rise and demise of the mortal and immortal, he is the dispenser of joys and sorrows, he is death, he is Yama, he is the controller, he is the father of his subjects.'<sup>45</sup> The chapter makes no attempt to reconcile these two positions. Both definitions, along with others, are equally valid. This polysemy allows both substantive and deific meanings of *vayu* to co-exist. It is both a specific 'moribific entity', to use a term coined by Sanskritist G. Jan Meulenbeld, as well as a deity. It was this polysemy and the agentic/deified set of meanings that Maitreya was deploying when, to Ray's mild vexation, he insisted that *pitta*, another one of the *doshas*, was actually the god Brahma.<sup>46</sup>

Another aspect of premodern discussions of *doshas* was that, unlike the humours of classical Greek medicine, each of the three *doshas* had their own particular 'seats' or *doshasthanas*. Thus *vayu* is generally localised in the large intestine, *pitta* in the navel, and *kapha* in the chest.<sup>47</sup> Pathogenesis was not merely the result of increase or decrease of *doshas*

but rather their displacement. The *Madhukosha*, a famous premodern commentary on the *Rogavinishchaya*, thus states that, ‘when a [*dosha*] that maintains its proper measure is dragged away from its receptacle by the wind and moved to another seat, it generates even if maintaining its proper measure, a morbid alteration.’<sup>48</sup>

Finally, the *doshas* themselves are not monolithic, homogenous entities. Each of the three, *vayu*, *pitta*, and *kapha*, are internally differentiated by location and function into five subordinate types.<sup>49</sup> In some cases even the direction of their movement, that is, upward, downward, or lateral, is taken into consideration.<sup>50</sup>

Premodern ideas about *doshas* therefore had three significant aspects that I have highlighted here. First, they existed on a spectrum between being deified/agentic and substantive things in the body. Second, while they were capable of motion, they had very specific seats in the body. Finally, they were not homogenous entities. Their translation as either electricity or heat elided all these meanings and rendered them into fluid energies cognisable by Western physics and physiology. In so doing it also homogenised and rationalised the space inside the body. Instead of being an internally variegated and, one might say, ‘suprational’ space where deities could reside, it was rendered into a mundane and uniform space organised around a reticulated network of *snayus*.

These *snayus* themselves are no less interesting. In Ray’s writings they acquired a strong resemblance to nineteenth-century ideas about nerves. Sanskrit scholar Dominik Wujastyk points out, however, that ‘Faced with the word *snayu*, one is virtually obliged to use its English cognate term “sinew”. But the *snayus* seem sometimes to refer to what are today called nerves rather than to sinews or tendons.’<sup>51</sup> Ray’s translation then, while not entirely wrong, is at best a partial reading. Structures that could simultaneously be sinews, tendons, or nerves are certainly different from what nineteenth-century physiology described as ‘nerves’.

Elsewhere I have described the image of the body crafted by Ray and his contemporaries as a *Snayubik Man*.<sup>52</sup> I think of such images as ‘physiograms’, that is, ‘materialized physiologies’ or ‘middle-level inchoate generalities (about the body) embedded in everyday forms of medical practice.’<sup>53</sup> In Ray’s repeated descriptions of the workings of the body we catch a glimpse of this physiogram of the *Snayubik Man*. The reticulated and rationalised physiological space it occupied had

been fashioned out of a three-way exchange between physics, physiology, and Ayurveda through the shared metaphors of the railway and the telegraph.

### The *Snayubik Man*

Interestingly, the *Snayubik Man's* fluid, undifferentiated energies did not last long in practice. Long-entrenched Ayurvedic belief in the internal subdivisions of the *doshas* re-emerged in Ray's writings, thereby complicating, if not undermining, his metaphors of electricity and heat. Yet these subdivisions did not re-emerge in their classical form. They, too, acquired new locations and functions.

*Pitta*, which Ray had equated with heat, is a good example of the new subdivisions within the *Snayubik Man*. According to the *Susruta Samhita*, the second oldest Ayurvedic treatise, *pitta* has five subtypes, namely, *pachaka-pitta* situated between the *pakkashaya* (stomach) and the *amashaya* (mucous receptacle in the belly), *ranjaka-pitta* located in the liver and spleen, *sadhaka-pitta* located in the heart, *alochaka-pitta* located in the eyes, and *bhrajaka-pitta* located in the skin.<sup>54</sup> Ray's description of the location of these five subtypes of *pitta* was different. He located *pachaka-pitta* in the gall bladder, *ranjaka-pitta* in the liver and spleen, *alochaka-pitta* in 'that part of the brain (*mastishka*) which is known as the optic thalamus', *aadhaka-pitta* in the brain (*mastishka*) more generally, and *bhrajaka-pitta* on the surface of the skin.

There is clearly a general tendency in Ray to map the location of the five types of *pittas* onto a biomedical anatomic space. While preserving a broad locational symmetry, he therefore tries to be more bio-anatomically specific. Instead of placing *pachaka-pitta* somewhere in between the *pakkashaya* and the *amashaya*, he located it precisely in the gall bladder. Similarly, in the case of *bhrajaka-pitta* he located it specifically on the surface of the skin. But in some cases Ray's attempts to find precise bio-anatomical correlates led him to radically alter the original location. Thus in the case of *alochaka-pitta*, he located it in the 'optical thalamus' – a bio-anatomic structure that made little sense in a classical Ayurvedic imagination of the body. What seems to have motivated him is his general reading of the Ayurvedic tradition to make this type of *pitta* responsible for visual cognition of form. Since the bio-anatomical body of Western medicine held that the actual act of visual cognition

took place in the brain and not the eyes themselves, he had to relocate *alochaka-pitta* from the eyes to the optic thalamus. Even more dramatically, but motivated undoubtedly by a similar quest to reconcile the bio-anatomic body with the Ayurvedic body, he located *sadhaka-pitta* away from the heart and in the brain.

These relocations are significant in themselves. By depriving the eyes and the heart of cognitive functions and by consolidating these cognitive actions in the brain, Ray affected a significant shift in Ayurvedic anatomy. The 'mind' in Ayurveda had never been exclusively identified with the brain. As the *Charaka-samhita* stated, 'The mental faculty is indeed independently produced. It is what binds the life together with the experiencing body, and just before it departs, its behaviour alters, affection mutates, all the senses suffer, strength drains away, and diseases wax strong.'<sup>55</sup> It continues further that, it is this mind that is the apprehender of the senses. Clearly then, the act of cognition is not located in the brain, but rather in this independent mental faculty.

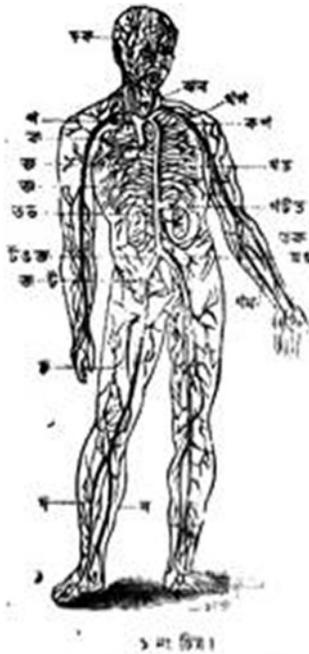
In fact, the close identification of the self with the mind, and the mind with the brain, is novel even within the Western tradition. Regarding this ascendancy of the brain as the prime location of selfhood under modernity, Fernando Vidal has dubbed it 'brainhood'. Vidal argues that the 'cerebral subject' was an anthropological figure inherent in modernity and one that ideologically motivated much of modern neuroscientific research, rather than emerging from such research.<sup>56</sup> Clearly, Ray was being driven by the same ideological propensities that were inspiring the emergence of Western 'brainhood' precisely at this time.

Yet, what is interesting is that this emergent brainhood in Ray is disrupted and left inchoate by his insistence of the circulatory nature of *pitta*. If *alochaka-* or *sadhaka-pitta* were the quintessential cognitive forces, their location in the brain must be balanced with their understanding as a form of 'heat' that can flow throughout the body. There was thus a fundamental contradiction in the *Snayubik Man* between its cerebral subjectivity that resonated with contemporary Western explorations in neurology and the more holistic subjectivity engendered in the hydraulic metaphors of electricity and heat.

The *Snayubik Man* was in effect pulled in two different directions. On the one hand, there was a bodily imagination that was clearly centred on the brain. On the other hand, there was an image of the body that was circulatory and did not privilege any one part over another.

Neither of these two possible imaginations had been available in this form in classical Ayurveda. They had both emerged through Ray's tryst with modernity. The fluid metaphors he drew from the physical sciences were as modern as the brainhood. But yoked together they did not always work in unison. As a result the *Snayubik Man* was an unstable, effervescent entity constituted in the cauldron of two opposing tendencies.

The contradictory pulls engendered in the *Snayubik Man* are clearly noticeable in the visual representations of the modern Ayurvedic body. While a familiar Western image of the circulatory system was progressively incorporated into modern Ayurvedic texts, these images conspicuously lacked a discrete brain, showing only a tangle of nerves in the skull, whereas the Western templates they were drawn from invariably possessed a distinct brain.



**Figure 9.1** Nagendranath Sengupta, *Sachitra Susruta Samhita*.

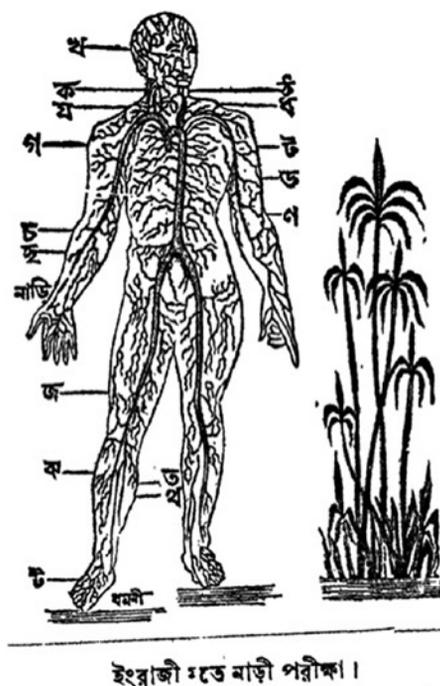


Figure 9.2 Gopalchandra Sengupta, *Ayurveda Samgraha* (Calcutta, 1871).

### Experience and metaphors

By the time Ray began writing, the ‘kinship of nineteenth-century physics and physiology’ was well established through such eminent authors as Hermann von Helmholtz.<sup>57</sup> This kinship was engendered in a constant flow of metaphors, and a host of leading European scientists of the nineteenth century used the same metaphors of electricity, telegraphs, railways, and so on that Ray deployed. It was highly likely then that Ray himself had merely stumbled upon these metaphors in the course of his *daktari* education and redeployed them. Such a purely textual genealogy of Ray metaphors, however, would be misleading. Even if he had indeed picked up these metaphors from his readings in

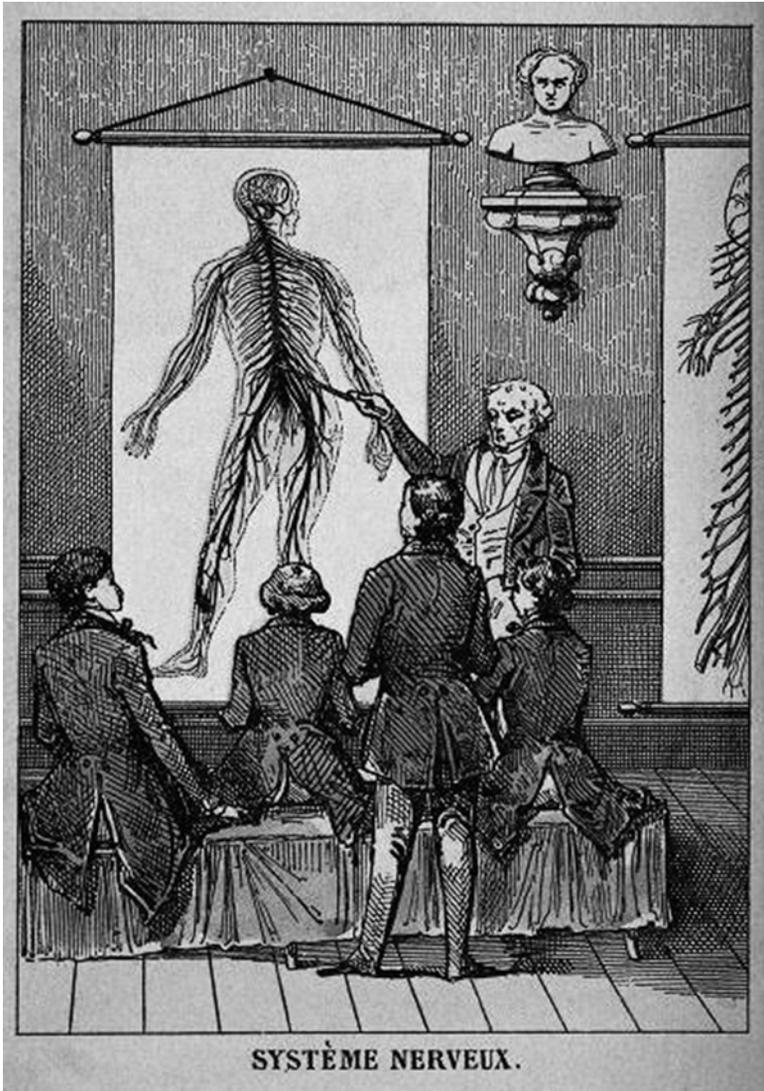


Figure 9.3 Lecture on the Nervous System from 1860. Wellcome Images.

Western scientific literature, how he used them was shaped by his own experiences of the material realities of colonial infrastructure.

Railways had been introduced in Bengal in the early 1850s and were quite well established by the 1890s.<sup>58</sup> After 1870, precisely the time when Ray was growing up, the railways began to grow at an exponential rate. Route mileage grew from a mere 4,771 in 1870 to 26,955 in 1905. Passenger traffic went up from 19,283,000 in 1871 to 231,283,000 in 1905.<sup>59</sup> The story of the telegraph system was broadly similar. After early experiments by the talented W. B. O'Shaughnessy in the 1830s, the first telegraph networks in India began to be built by 1851. By 1851, 4,000 miles of cables had been established in the major seats of British power. It was the great mutiny and rebellion of 1857 that spurred the British to speed up the building of telegraphic lines. Thus, within two years of the rebellion, and despite the damage done during that time, the mileage of telegraph lines had jumped to 11,000 by 1859. Like the railways, the telegraph had also been heartily embraced by the local people. In 1855 Kalidas Maitra, a Bengali intellectual, penned the first Bengali book on telegraphy which also gave detailed explanations about electricity.<sup>60</sup>

Ironically, even as the usage of the railways and the telegraphs grew, most Hindu Bengalis, such as Ray, were barred from technical proximity with these technologies. Particularly after the rebellion of 1857, anxious to keep the channels of communications in the hands of social groups whose loyalty the imperialists felt more confident about, the British followed a deliberate policy of employing Eurasians in both the railways and the telegraphs.<sup>61</sup> The scope for men such as Ray to get closely acquainted with these technologies was therefore limited by official policy. They were only allowed to consume the services provided by these technologies, not work with them closely.

Ray therefore knew of these communication networks as a consumer, not as an operator. Yet these communication networks remained the only ways he could interact with electricity. Domestic electricity was still a long way off in the 1890s for most people, even in the capital city of Calcutta, not to mention the village of Talanda in Rajshahi where Ray was based. Moreover, the consumer's relationship with this kind of large technological system could never be as intimate as the relationship of users with smaller, everyday technologies.<sup>62</sup> As a result,

when Ray turned the railways and the telegraph into metaphors, his usage was marked by his own distant and mediated experience of these technologies.

Two major features of Ray's metaphoric usage mark him off from European men of science who also deployed such metaphors. For Helmholtz, and most of the other Europeans interested in such metaphors, the metaphoric interest in networks, circuits, and electricity led putatively to actual experimentation. This concrete experimental ethos, in turn, progressively produced a sense of electricity as something measurable. Measurements of time became particularly important.<sup>63</sup> They began to ask questions about how long it took for bodily impulses to travel through the body or produce a reflex action, etc. None of this happened in Ray's case, despite his overt enthusiasm for conducting experiments.

Over the years, Ray, as we have seen above, carried out numerous experiments. But not one of them involved electricity. All his experiments were essentially chemical experiments involving gases and liquids or anatomical dissections of goats and rats. The mismatch between his experimental vigour and his broad-stroke, impressionistic description of the railways and telegraphs is a testament to how his own mediated experience of these technologies from afar influenced his thinking. As Otis points out with reference to Charles Babbage, 'The better one got to know machines, the better one understood the body and mind. Technology suggested not just what questions to ask about the nervous system but how to perform the experiments and what sort of answers one might expect to find.'<sup>64</sup>

In the absence of hands-on experience with the technologies, Ray's metaphors remained overly generalised. Otis has demonstrated with great acuity how Helmholtz's researches led not only him, but also Friedrich Nietzsche, to eventually evolve a new theory of knowledge itself as being metaphorical.<sup>65</sup> In Ray's case, none of this happened. But what did happen was rather surprising.

### From physiograms to cosmograms

In 1908, the same year that he published his versified Ayurvedic text, Ray also published his first cosmological text. Over the subsequent decades he went on to publish three more such texts with the last

volume appearing as late as 1941, when Ray would have been touching eighty. These books were audaciously ambitious works wherein Ray attempted to recover the history of those 'times of which there are no records'.

He himself divided the themes covered in these books into four broad areas: first, the mysteries of creation and the end of the world; second, the question of the origin of man and his early history until records could be found; third, the history of the planetary system and the cosmos; and finally, the history of the origin of language and writing. When he published the first of these books in 1908, he claimed that he had already been working single-mindedly on these themes for fourteen years. If this were true – and there is no reason to doubt him – it would probably explain why so little of his thinking on the body had changed between 1890 and 1908. It would also mean that he spent nearly forty-seven years – from around 1894 to 1941 – completely ignoring his medical interests and dwelling instead on these large cosmological issues.

Why did he do so? How were these interests connected? And why did he make no effort to connect the cosmological writings to his earlier medical ones? I argue that it was precisely because of the mediated, distant, and hands-off way in which he began to use the technological metaphors that led him down this track. Unlike men such as Helmholtz, for whom the metaphors led to experimentation and experimentation led to a theory of knowledge itself as being metaphorical, Ray's metaphors led him down a very different path. Since he never experimented with his metaphors upon the human body, there was little that the body could reveal to him. His metaphorical deployments thus became completely one-way. He used the world to understand the body and not the other way around. Thus, to him, the world at large increasingly seemed to be the source of all knowledge and secrets. There was nothing to be learnt within the body that could not be fathomed without it. This was in stark contrast to the centrality that Ayurveda affords to the body in thinking about the cosmos.<sup>66</sup>

Similarly, whereas Helmholtz, and following him Nietzsche, began to move away from a strictly referential and denotative idea of knowledge precisely because they began to interrogate the workings of the mechanisms of perception itself, Ray once again went in the opposite

direction. Not only did he not interrogate how perception worked, he increasingly arrived at a strongly positivist idea that knowledge was to be gained, as he put it, by ‘breaking through metaphors and allegories.’<sup>67</sup> Repeatedly, Ray reiterated the need to ‘break through metaphors and allegories’ to ‘reveal the true history of nature.’ Reading widely and eclectically from the texts of Pierre-Simon Laplace to Charles Darwin on the one hand, and a wide array of religious literature from across the world ranging from the Zoroastrian Zend Avesta to the Christian Bible as well as the Quran and the Indic Vedas on the other, Ray pursued his key strategy of ‘breaking metaphors’. The fascinating cosmology he arrived at through his strategy and his elaborate mathematical calculations are too rich and complex to unpack here. But it included, amongst other things, an ancient race of man-lions, an extremely dark-skinned Aryan race inhabiting the Arctic regions at a time when the rest of the planet was simply too hot to sustain life, a global climate change attended by large-scale migrations, life on the moon, and much else. He even attempted to start a new calendar which, according to him, would be pegged to the actual geological age of the earth.

This elaborate cosmology that Ray worked out throughout his life was, of course, not simply an aimless, benign, and apolitical set of musings. It was as political as his physiograms of the *Snayubik Man* had been. It was in fact a ‘performative assertion, [an] entr[y] into debates, points of reference for further elaboration.’<sup>68</sup> It was, in other words, what John Tresch has called a ‘cosmogram’, a materialised cosmology that bore the political and historical imprint of the milieu in which it was created.<sup>69</sup> Throughout these cosmological texts Ray sought to reveal the validity of what he called ‘ancient Aryan knowledge’. To do so, he repeatedly spoke of ‘Nature’ as an objective entity out there whose ‘history’ had to be revealed by the application of ‘science’ to break open the ‘metaphors and allegories’. Yet, all that this ‘science’ eventually proved was the glory of the ‘ancient Aryans’. But along the way it also completely recast traditions about those ‘ancient Aryans’. The movement from the modern to the ancient and back to the modern – in a way that created an alternative modernity orthogonal to the hegemonic colonial modernity which also managed to heap glory on the ancient Aryans – was almost identical to how the *Snayubik Man* had been figured. The only difference was that Man, *Snayubik* or otherwise, had now disappeared in the mists of the cosmos.

What led from the alternately modern man to the differently modern cosmos were metaphors. In the absence of experimental possibilities, and with the body being rendered a mere screen upon which metaphors played out their stories, Ray had come to seek knowledge not through, but beyond metaphors. Metaphors would be what would then connect the knowledge back to the body. But the truth itself stood beyond the reach of the metaphors, and without the confines of the body, in the depths of the cosmos. This position also broke with the earlier pattern of his embrace of a late nineteenth-century European notion of 'nature' and 'natural laws'. Whereas the former had consistently included the human body as a crucial constitutive element, Ray's cosmological writings entirely abandoned it.

Whilst Ray's early medical writings are fairly representative of late Victorian trends in Bengali Ayurvedic circles,<sup>70</sup> his abandoning the body altogether in the pursuit of a new cosmology is highly quixotic. In their idiosyncratic singularity, however, they illuminate how an enthusiastic engagement with Victorian technologies, without the possibility of hands-on access to them, could lead Ayurvedic modernity away from the concrete practicalities of the body and towards purely speculative contemplation of the cosmos.

Distinctive modernities were not simply imaginal formations engendered by the creativity of particular intellectual agents. Neither distinctive intellectual inheritances nor the mere fact of geographic distance were in themselves sufficient to produce alternative medical modernities. They were developed within particular social, political and material contexts. In colonial Bengal it was these practical exigencies that shaped Ray's singular version of an Ayurvedic modernity. On the one hand the colonial state's need for cheap medical manpower created the educational institutions that acquainted him and numerous others like him with new ideologies of scientific medicine. At these institutions Ray and his peers imbibed new ideals of curiosity and observation and embraced new images of 'science' and 'nature'. Likewise, it was the colonial state's economic and political interests that produced the large technological infrastructures, such as the railways and the telegraph, which informed Ray's thinking. On the other hand though, the possibilities for conducting original medical research or gaining practical operative experience with technological equipment were severely limited for lowly Bengali VLMS doctors like Ray. They were neither encouraged

to undertake such experiments nor given access to material resources to pursue experimental programmes that Western scientists of the day could pursue.

The colonial state had hoped that these doctors would imbibe a modicum of 'Western science' and then be happy to apply their training in the service of state in either a military or civil posting in the vast subcontinent hinterland. For the state, these were not really men of science. They were just a cheap fix for a large administrative responsibility. But men like Ray had other ambitions. As upper-caste men who had enjoyed social status through their links to precolonial traditions of learning, they saw themselves as unique inheritors of two distinct traditions of knowledge. It was their self-appointed task to compare, contrast, translate, and evaluate these two traditions to which they alone seemed to have access. Both the eponymous 'grandfather' and the ghostly figure of the 'Western scientists' who flitted through Ray's writings were limited to only one tradition. But as legatees to both traditions, Ray, and quite a few like him, saw themselves as distinct from either. The colonial state's diminutive sense of Ray's role and his own grandiose sense of purpose were hence constantly forced to rub against each other. His singular medical modernity was cooked in the cauldron of these contradictory material realities established by the colonial regime.

Medical historiography, like the colonial state before it, imagines a singular medical modernity because it imagines the non-West as a *tabula rasa* upon which Western scripts could be authored. As we see in Ray's case, however, the non-West was not an intellectual *tabula rasa*. The script of Western medicine had to be written upon the palimpsests that bore the distinct marks of earlier therapeutic traditions. The way historical agents such as Ray read these two scripts, one slightly fading and another still emergent, depended upon the social, political, and material context within which they encountered the therapeutic palimpsest.

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