

1 'Fairest of Peruvian Maids' Planting Cinchonas in British India

The real Eldorado of India is Cinchona.¹

Where Andes hides his cloud-wreathed crest in snow
And roots his base on burning sands below;
Cinchona, fairest of Peruvian maids,
To health's bright goddess, in the breezy glades
Of Quito's temperate plains, an altar reared,
Trilled the loud hymn, the solemn prayer preferred.²

Europeans owed their initial encounters with cinchona plants to the consolidation of Spanish imperial rule in the interiors of South America. As objects of commerce and knowledge, cinchonas had been made to travel from South America to various corners of Europe and beyond since the mid-seventeenth century.³ However the mid-nineteenth century was particularly significant in the history of the cinchonas as the Dutch, British and French colonial governments began to express a new interest in these plants. The 1850s, as many historians have shown, witnessed the beginnings of organised attempts to collect and transport cinchona seeds and plants from 'natural' South American forests towards the sites of 'experimental plantations' in colonial Africa and the East and

¹ F. C. Daukes to Secretary, Government of Bengal, Medical and Municipal Department, 27 June 1881, Simla. *Home, Medical*, June 1881 47–49 A (NAI).

² Cited in the title page of W. D. Hooker, *Inaugural Dissertation upon the Cinchonas, their History, Uses and Effects* (Glasgow: Edward Khull, Dunlop Street, 1839).

³ S. Jarcho, *Quinine's Predecessor: Francesco Torti and the Early History of Cinchona* (Baltimore and London: Johns Hopkins University Press, 1993); M. J. Crawford, *Empires Experts: The Politics of Knowledge in Spain's Royal Monopoly of Quina, 1751–1808* (unpublished doctoral dissertation, University of California, San Diego, 2009); A. Holger Maehle, *Drugs on Trial: Experimental Pharmacology and Therapeutic Innovation in the Eighteenth Century* (Amsterdam: Rodopi, 1999), 223–309; D. Bleichmar, 'Atlantic Competitions: Botanical Trajectories in the Eighteenth-Century Spanish Empire', in J. Delbourgo and N. Dew (eds), *Science and Empire in the Atlantic World* (New York and Abingdon: Routledge, 2007), 242–244.

West Indies, particularly, Dutch Java, British India, Ceylon and Jamaica and French Algiers.⁴

In the wider histories of colonialism, plants have figured variously as objects of collection, classification, profit, intrigues and collaboration,⁵ as sources of military prowess,⁶ as nodes of resistance,⁷ as markers of geographical distinction and cultural difference,⁸ as emblematic of rural social life, livelihoods, adaptations and reinventions,⁹ and even as signifiers of memory amongst postcolonial refugees.¹⁰ Plants have often been situated at the interstices of the histories of imperial science, evangelism, commerce and politics.¹¹ Drawing on these broader concerns, historians like Richard Drayton and Kavita Philip, who have commented on the establishment of colonial cinchona plantations, have shown how the globalised networks of economic botany, plantation capital and imperial ideology informed one another.¹²

⁴ R. Drayton, *Nature's Government: Science, Imperial Britain, and the 'Improvement' of the World*, (New Haven: Yale University Press, 2000), 207–211; K. Philip, *Civilising Natures: Race, Resources and Modernity in South Asia* (Hyderabad: Orient Longman, 2004), 240; A. Mukherjee, 'The Peruvian Bark Revisited: A Critique of British Cinchona Policy in Colonial India', *Bengal Past and Present*, 117 (1998), 81–102; L. H. Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens* (New Haven: Yale University Press, 2002), 104, 117–125. See also, M. Honigsbaum, *The Fever Trail: The Hunt for the Cure for Malaria* (London: Macmillan, 2001); F. Rocco, *Quinine: Malaria and the Quest for a Cure that Changed the World* (London: Harper Collins, 2003).

⁵ Bleichmar, 'Atlantic Competitions', 225–252; D. P. Miller and P. H. Reill (eds), *Visions of Empire: Voyages, Botany and Representations of Nature* (Cambridge and New York: Cambridge University Press, 1996); J. Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2008), 1–30.

⁶ D. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (Oxford: Oxford University Press, 1981), 58–79.

⁷ L. Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge Mass.: Harvard University Press, 2004), 142–149.

⁸ D. Arnold, 'Envisioning the Tropics: Joseph Hooker in India and the Himalayas, 1848–1850', in F. Driver and L. Martins (eds), *Tropical Visions in an Age of Empire* (Chicago and London: University of Chicago Press, 2005), 142–143.

⁹ W. Beinart and L. Worschla, *Prickly Pear: Social History of a Plant in the Eastern Cape* (Johannesburg: Wits University Press, 2013), 8–10.

¹⁰ R. Dasgupta, 'Justice in a Landscape of Trees', <http://humanitiesunderground.wordpress.com/2012/08/05/justice-in-a-landscape-of-trees/> [retrieved on 29 April 2013].

¹¹ S. Sivasundaram, *Nature and the Godly Empire: Science and Evangelical Mission in the Pacific, 1795–1850* (Cambridge: Cambridge University Press, 2005), 175; M. T. Bravo, 'Mission Gardens: Natural History and Global Expansion, 1720–1820', in L. Schiebinger and C. Swan (eds), *Colonial Botany: Science, Commerce and Politics in the Early Modern World* (Philadelphia: University of Pennsylvania Press, 2005), 49–65.

¹² Drayton, *Nature's Government*, 207–210, 230, 231; Philip, *Civilising Natures*, 240–267. See also L. Veale, *A Historical Geography of the Nilgiri Cinchona Plantations, 1860–1900* (unpublished doctoral dissertation, University of Nottingham, 2010); A. R. Hoogte and T. Pieters, 'Science in the Service of Colonial Agro-Industrialism: The Case of Cinchona

This chapter builds upon these existing histories to examine the ways in which the image of cinchonas as valuable plants were historically produced and maintained.¹³ It follows the historical efforts to circulate and plant cinchonas in British India in the 1850s and 1860s to reveal how and why a set of material properties was ascribed to these plants. These decades marked, I argue, an occasion for the reconstitution of cinchonas as a political symbol, as a valuable commodity and as an object of botanical knowledge. The commodity status of cinchonas was reinforced through various 'localised negotiations'.¹⁴

Colonial geographers, planters, botanists and bureaucrats reaffirmed, shared and sustained amongst themselves the impression that the cinchonas were valuable plants through certain recurrent vocabulary, strategies and practices. The discourses, techniques and predicaments associated with circulating and planting cinchonas in British India during this time suggests the production of a colonial bureaucratic consensus about these plants. Further, this consensus was internalised beyond the confidential files of the imperial state. Interest in cinchonas was reflected not only in widely cited memoirs, unpublished travel narratives and routine bureaucratic correspondence, but also in the aspirations of private planters, local Rajas, distant newspaper reporters, contending vernacular advertisements, photographers and illustrators amongst others.

The commodification of cinchonas in British India of the 1850s and 1860s was achieved through the official detailing of the intense physicality of these plants. Cinchonas were projected not as vacuous, unresponsive objects but as variously living, surviving, changing, decaying, dying, corporeal entities. Cinchonas figured as rare, distant, alien, brittle, sensitive, delicate, feminine beings which were difficult to tame in British Indian plantations. Yet, the construction of cinchonas as invaluable rarities coalesced with programmatic visions about the plausibility of managing and naturalising cinchonas in British India, and these plants appeared suitably malleable. Thus in various plantation records in the 1860s, cinchonas could appear as both enchanting and profane, both exotic and accessible, as a symbol of the distant and also of the everyday.

Cultivation in the Dutch and British East Indies, 1852–1900', *Studies in the History and Philosophy of Biological and Biomedical Sciences*, 47, PA (September 2014), 12–22.

¹³ Philip mentions the word 'commodification' in pages 240, 268, 270, but does not elaborate. For maintenance and repair, see B. Latour, 'Whose Cosmos, Which Cosmopolitics? Comments on the Peace Terms of Ulrich Beck', *Common Knowledge* 10, 3 (2004), 459.

¹⁴ For 'localised negotiations' see E. C. Spary, 'Of Nutmegs and Botanists: The Colonial Cultivation of Botanical Identity', in L. Schiebinger and C. Swan (eds), *Colonial Botany: Science, Commerce and Politics in the Early Modern World* (Philadelphia: University of Pennsylvania Press, 2005), 203.

The history of the imperial production of such a liminal plant can be variously meaningful. First, it makes possible an engagement of approaches in the cultural histories of (particularly botanical) knowledge production with insights available in the existing histories of commoditisation.¹⁵ It also enables a deeper conversation with newer works, which have begun to analyse the historical ascriptions of lifelike properties to politically significant plants.¹⁶ Efforts to commodify cinchonas were intimately linked to the assertions about their lively properties. Secondly, human and nonhuman assemblages enabled the making and sustenance of the cinchonas in British India. Cinchonas were as much shaped by some of the necessary constituents of the 'material culture of colonial botany' in the mid-nineteenth century like Wardian cases, steamers, small pots, herbariums, plantations, royal gardens and so on, as they were by the priorities of human actors like planters, bureaucrats, botanists and geographers.¹⁷ Thirdly, circulation from one part of the world to another appears to have been a transformative experience for these plants. Cinchonas not only adapted to newer habitats, but also acquired newer experts, identities and functions. In what follows, cinchonas are revealed as a mutating entity rather than stable and unchanging. Finally, in various ways, cinchona plants and Empire shared a symbiotic relationship. The apparatuses and exigencies of imperial rule predominantly occasioned the status of cinchonas as valuable objects of plantation in the 1850s and 1860s. Efforts to plant cinchonas in British India, in turn, reinforced and sustained an imperial network of ideologies, protocols, travels, connections, botanical rivalries, correspondence, exclusions and prejudices.

Discovery of an Event

In 1820, French chemists Pierre Joseph Pelletier (1788–1842) and Jean Bienaime Caventou (1795–1887) claimed to have detected the presence of two distinctly different alkaloids in the grey, yellow and red varieties of cinchona barks. They named these two different 'salifiable bases', cinchonine and quinine. In 1820 it was uncertain whether this constituted a

¹⁵ Ibid; Spary, 'Of Nutmegs', 187–203; P. Anker, *Imperial Ecology: Environmental Order in the British Empire, 1895–1945* (Cambridge, Mass.: Harvard University Press, 2001).

¹⁶ L. Totelin, 'Botanizing Rulers and their Herbal Subjects: Plants and Political Power in Greek and Roman Literature', *Phoenix*, 66, 1–2 (2012), 122–144; S. Gibson, *Animal, Vegetable, Mineral? How Eighteenth-Century Science Disrupted the Natural Order* (Oxford: Oxford University Press, 2015), 149–178.

¹⁷ L. Schiebinger and C. Swan, 'Introduction' in Schiebinger and Swan (eds), *Colonial Botany*, 13–15.

momentous achievement. Immediate responses from the scientific community in Paris were lukewarm. Pelletier had to wait for another five years before he was promoted. He became a professor at the School of Pharmacy in Paris in 1825. Formal recognition in the form of an award reached them after seven years in the form of the Montyon Prize, which they shared in 1827, the first and perhaps only award they ever received. Pelletier was made a member of the Academy of Sciences in Paris twenty years later in 1840. That was two years before he died at the age of fifty-four. Caventou was promoted to professorship fifteen years later in 1835.¹⁸

Amongst contemporary studies on the chemistry of cinchona barks their accomplishment appeared significant but unexceptional. From the mid-eighteenth century cinchona barks had attracted the attention of many reputed continental phytochemists. Histories of these studies tend to be teleological success stories, dotted with big names.¹⁹ Knowledge about the chemistry of cinchona barks has been shown in these narratives to proceed from one significant milestone to another, with each breakthrough tending to verify, build upon, refine or correct previous understandings. For instance, it has been shown how Pelletier derived hints from studies about morphine and opium by the Hanoverian apothecary F. W. Serturner (1783–1841) between 1806 and 1818.²⁰ It has been pointed out that in 1820 Pelletier and Caventou's success lay in 'reinvestigating'²¹ and correcting 'a mistake'²² in the chemical characterisation of cinchonine by Bernardino Antonio Gomes. Gomes, a Portuguese naval surgeon, had apparently treated a cinchona extract with caustic potash and obtained an alkaloid product, which he named cinchonino in 1810.²³ Gomes, in turn, was trying to 'purify'²⁴ an almost similar vegetable substance detected in the bark of the cinchona trees by Andrew Duncan Junior (1773–1832) of Edinburgh. At the beginning of the nineteenth century, Duncan Junior called that vegetable substance cinchonin. Similar studies concerning the alkaloid-chemistry of different varieties of cinchona barks did not end in 1820. In 1829, Pelletier himself claimed to refine his earlier findings and suggested the presence of a third alkaloid aricine in the cinchona barks. In 1852, Louis Pasteur named two newer alkaloids as quinidine and cinchonidine. Pasteur

¹⁸ L. F. Haas, 'Pierre Joseph Pelletier (1788–1842) and Jean Bienaime Caventou (1795–1887)', *Journal of Neurology, Neurosurgery and Psychiatry*, 57 (1997), 1333; G. E. Trease, 'Pierre-Joseph Pelletier (1788–1842): The Discoverer of Quinine', *British Journal of Pharmaceutical Practice*, 2, 7 (1980), 32–33; Maehle, *Drugs on Trial*, 282–283.

¹⁹ LaWall, 'The History of Quinine', *Medical Life*, 38, 4 (April 1931), 195–216.

²⁰ Maehle, *Drugs on Trial*, 282–283. ²¹ Trease, 'Pierre-Joseph Pelletier'.

²² Maehle, *Drugs on Trial*, 282–283. ²³ Trease, 'Pierre-Joseph Pelletier'.

²⁴ Maehle, *Drugs on Trial*, 282–283.

suggested that quinidine had earlier been located in the cinchona barks by L. Henry and Auguste Delondre in 1833, while F. L. Winckler had 'isolated' cinchonidine in 1844.²⁵ By 1871, phytochemists had already traced the presence of around eleven such alkaloids in the barks of different varieties of cinchonas.²⁶ Besides, from the early 1840s considerable attention had been devoted towards analysing the constituents of the roots of the cinchonas.²⁷

In retrospect, amongst innumerable such analyses into the chemistry of cinchona barks since the late eighteenth century, the accomplishment of Pelletier and Caventou in 1820 stands out. Such recognition results from the extensive market response to quinine in particular. Commercial considerations had from the late-seventeenth century necessitated studies of cinchonas. A wide range of healing qualities was attributed to the barks of the cinchona trees in Europe since then. Physicians and pharmacologists had around this time begun analysing whether certain species of cinchona barks were more medically efficacious than others. It was hoped that by identifying particular cinchona species which were best endowed with therapeutic properties, these analyses would provide a rationale for the traders in making profitable choices. European traders dealing in cinchona barks, it was believed, could then invest in the most valuable trees.²⁸

The historian Andreas Holger Maehle has shown how the therapeutic properties of the barks were examined through *in vitro* and animal experiments, chemical tests and microscopic observations, and clinical case histories in the hospitals, army, navy and private practices.²⁹ By the early eighteenth century some general criteria for the assessment of barks became known: considerable emphases were, for instance, laid on 'colour, consistency and taste' of the barks.³⁰

The belief that the curative potentials attributed to cinchona barks could most reliably be explained in terms of 'an active principle' emerged in the late eighteenth century. This was made possible by the gradual entrenchment of a new language of science, evident in the sustained confidence expressed by commercial interests in the emerging discipline of organic chemistry. It was suggested that the curative agent inherent in cinchona barks could be a chemical, an alkaloid or a salifiable base.

²⁵ LaWall, 'The History of Quinine', 210.

²⁶ J. Broughton, 'Chemical and Physiological Experiments on living Cinchonae', *Philosophical Transactions of the Royal Society of London*, 161 (1871), 1–15.

²⁷ T. Anderson, to W. Grey, No. 333, 11th February 1862. *Home, Public*, 22nd February 1862, 54–58 A. (NAI).

²⁸ S. Tomic, 'Chemical Analysis of Plants: The Case of Cinchona', *Annals of Science*, 58, 3 (2001), 287–309. Also Bleichmar, 'Atlantic Competitions', 243.

²⁹ Maehle, *Drugs on Trial*, 268–273. ³⁰ *Ibid.*, 275.

In its 'pure form', it was hoped, it could be 'chemically analysed', 'isolated', 'discovered' by the phytochemists. Fifty years between 1779 and 1829 witnessed the publication of more than three hundred monographs about the chemistry of the cinchona barks.³¹ These studies were published from various parts of Europe – including present-day France, England, Germany, Scotland, Russia, Sweden and Holland.³² These appeared inseparably bound up with the necessities of commerce, especially in providing advice to investors in selecting more valuable species of cinchonas.³³ To ascertain the pharmaceutical properties inherent in different varieties of cinchona barks, the Harveian Society of Edinburgh 'laudably decreed two prize medals'.³⁴

Late eighteenth century onwards, alkaloid chemistry had a symbiotic relation with the market. Traders in the cinchonas depended on phytochemists for ratification of their business decisions. At the same time, alkaloid chemistry established its legitimacy by deriving patronage from commercial interests. It is unsurprising then that some of the early breakthroughs in the field of alkaloid chemistry were attained in relation to articles which would eventually be considered commercially viable. The first alkaloid was claimed to be isolated in Paris in 1803. It was later named as narcotine. Morphine was isolated from opium in 1806; strychnine was isolated from *Nux Vomica* in 1818; caffeine was 'found' in 1821.³⁵

The disparate roles of alkaloid-chemist and trader often overlapped. It has been pointed out that most of the early researchers of alkaloids were pharmacists and many discoveries were made in their shops. Charles Deronse, who is attributed with the glory of isolating narcotine, was a French pharmacist. F. W. Serturmer, a Hanoverian apothecary, isolated morphine. Pelletier followed the footsteps of his father in directing the Pelletier Pharmacy. K. E. W. Meissner (1792–1855), who 'found'

³¹ H. Hobhouse, *Seeds of Change: Five Plants that Transformed Mankind* (New York: Harper Collins, 1987), 14.

³² *Ibid.*

³³ For instance, R. Kentish, *Experiments and Observations on a New Species of Bark, Showing its Great Efficacy in Very Small Doses, also a Comparative View of the Powers of the Red and Quilled Bark; Being an Attempt Towards a General Analysis and Compendious History of the Valuable Genus of Cinchona, or the Peruvian Bark* (London: J. Johnson, 1784); W. Sanders, *Observations on the Superior Efficacy of the Red Peruvian Bark, in the Cure of Fevers* (London: J. Johnson, 1782); J. M. H. Moll, 'William Saunders, 1743–1817', *Journal of Medical Biography*, 1 (November 1993), 235.

³⁴ J. Relph, *An Inquiry into the Medical Efficacy of a New Species of Peruvian Bark, Lately Imported into this Country Under the Name of Yellow Bark Including Practical Observations Respecting the Choice of Bark in General* (London: James Phillips, 1794).

³⁵ Trease, 'Pierre-Joseph Pelletier'.

sabadilline in the Cevadilla seeds, was a Prussian apothecary; F. F. Runge, who 'found' caffeine, was a German pharmacist.³⁶

The first and the most sustained effort towards propagating the virtues of quinine came from an experimental physiologist based in Paris, Francois Magendie, in the 1820s. It is hardly surprising that in successive texts he overtly addressed the market. In his *Formulary*, published first in 1821, he was inspiring druggists to initiate extensive manufactures of quinine. He however did not confine himself into advertising the virtues of quinine alone, and was equally emphatic in asserting the medicinal attributes of almost every other 'newly isolated alkaloids', such as iodine, bromine, morphine, strychnine, veratrine and emetine besides quinine.³⁷ This text went into several editions and was translated into several languages.

Even before the first North American edition of this book, which was translated by Dr Robley Dunglison, was published in 1824, businessmen Farr and Kunzi had started selling quinine to customers at 16 dollars per ounce. In 1823, a company based in Philadelphia named Rosengarten and Sons claimed to manufacture quinine from cinchona barks on a commercial scale.³⁸ A physician, Dr John Sappington (1776–1856), who practiced medicine on a farm near Arrock Rock in central Missouri, claimed to sell pills of quinine sulphate as John Sappington's anti-fever pills. He is reported to have made a fortune out of such business.³⁹ In London, Luke Howard, a retail pharmacist since 1795, set up a quinine factory in 1823.⁴⁰ In the same year, a pharmacist named Pietro Peretti (1781–1864) set up a quinine factory in Rome.⁴¹ In 1826, Riedel, a Swiss apothecary, began selling quinine at eight dollars an ounce in Berlin.⁴² Thus, by the mid-1820s, drug manufacturers of varying statures, backgrounds and pedigrees in Europe and North America had started investing in quinine production.

³⁶ Ibid.

³⁷ F. Magendie, *Formulary for the Preparation and Mode of Employing Several New Remedies: Namely, Morphine, Iodine, Quinine* (London: Thomas and George Underwood, 1824). Translated from the French of the third edition of Magendie's 'Formulaire' by C. T. Haden.

³⁸ LaWall, 'The History of Quinine', 206–209.

³⁹ W. A. Strickland, 'Quinine Pills: Manufactured on the Missouri Frontier (1832–1862)', *Pharmacy in History*, 25, 2 (1983), 61–68.

⁴⁰ J. H. Kirkwood and C. H. Lloyd, *John Eliot Howard: A Budget of Papers on His Life and Work*, (Oxford: Lloyd, 1995), 13–14.

⁴¹ *A Ledger of Peretti's Pharmacy, Rome dated 1823, in Which Are Entries of the Method of Preparation of Quinine Salt, the Purchase of Quinine, Pulverization, Price etc... 1823* (WL).

⁴² LaWall, 'The History of Quinine', 195–216.

In 1839, William Dawson Hooker, eldest son of the influential botanist William Jackson Hooker and brother of Joseph Dalton Hooker, the future director of the Royal Botanic Gardens at Kew, had applied for induction into the faculty of physicians and surgeons at the University of Glasgow. He wrote his inaugural dissertation on 'Cinchonas, their history, uses and effects'. This dissertation explained the extensive currency of quinine in pharmaceutical businesses in the 1830s.⁴³ Hooker attributed 'knowledge of the virtues of the Peruvian barks' solely to 'modern chemistry'. He suggested that modern chemistry brought precision and clarity of knowledge about the therapeutic properties of cinchona barks. Quinine, he argued, removed the uncertainties that characterised cinchona trade. By projecting quinine into the fore, it appears, 'modern chemistry' provided a definite indicator for measuring the values of each individual cinchona tree. Hooker suggested that quinine could be clearly measured, identified and distinguished from less valuable alkaloids by certain precise features.⁴⁴ He provided details of chemical tests to detect adulterated versions of quinine. He suggested separate tests (with sugar, sulphate of lime, boracic acid, margaric acid, stearine, starch etc) for detecting adulterations of quinine.⁴⁵

However, such promising laboratory manifestoes should be read with caution, as they do not necessarily indicate quotidian commercial practice. Existing histories have shown that different alkaloids inherent in cinchona barks were 'in all practical possibilities' indiscriminately referred to as quinine.⁴⁶ Many medics continued to believe that the combined effects of all the constituents of the cinchona barks made it an effective remedy.⁴⁷ Hooker himself suggested that quinine, cinchonine and aricine were closely similar alkaloids in their chemical composition. They seemed to minutely vary only in their content of oxygen.⁴⁸

It appears then that quinine, most generally, circulated in the market as well as in clinical practice as a convenient point of reference. Since the 1820s, quinine was projected to signify the collective virtues of cinchona plants. Quinine figured as a symbol, which defined enduring pursuits of a myriad of individuals, interests and institutions relating to the cinchonas. It emerged as an acceptable category around which different correspondences, negotiations, comparisons and competitions could revolve.

⁴³ Hooker, *Inaugural Dissertation*, 18–19. ⁴⁴ *Ibid.*, 19. ⁴⁵ *Ibid.*, 24.

⁴⁶ Hobhouse, *Seeds of Change*, 14–15. ⁴⁷ Machle, *Drugs on Trial*, 283.

⁴⁸ Hooker, *Inaugural Dissertation*, 19–20.

Quinine, since the mid-1820s, revealed considerable overlap between men of knowledge and men of commerce. The physician John Sappington, who made enormous money from selling pills of quinine in the early 1820s, eventually turned his medical business over to his sons in 1838 and began to devote more time in dealing in livestock, finance and land speculation. In 1844, he wrote a book called *The Theory and Treatments of Fevers*.⁴⁹ By 1826, Pelletier himself started manufacturing quinine on a commercial scale.⁵⁰

Botanical knowledge and commercial aspirations, however, converged most emphatically in the careers of different members of the Howard family in London. Throughout the nineteenth century the Howards were arguably the most influential business interests in quinine.⁵¹ Luke Howard had been a retail pharmacist since 1795. However his main interest lay in meteorology and his work on cloud formations over London earned him a Fellowship of the Royal Society in 1821. In 1823, however, he claimed to have dissociated pure form of quinine from other less valuable alkaloids present in the cinchona barks.

It was left to his son, John Eliot Howard, who initiated large-scale profitable manufacture of quinine on a commercial sense in the late 1850s (see Figure 1.1). By then, the Howards had advertised themselves as leading experts in England of knowledge about cinchona and its various extracts. Howard was in immediate correspondence with an elaborate network of travelling botanists from Europe who had ventured into the South American forests of Bolivia and Peru. He participated in an epistolary world of botanical knowledge production, and regularly exchanged letters and ideas with Hugh Algernon Weddell in Paris, Clements Markham in London and Hermann Karsten in Berlin.⁵² In such an exclusive world the correspondents endorsed themselves as experts by referring to or citing from the works of one another.⁵³ In 1857, in recognition of his status as an expert on quinine he was inducted into the Linnean Society. In 1858 he purchased an entire collection of cinchona barks from Professor Pavon of Madrid. In 1862 Howard translated the professor's manuscript into English and edited a pictorial representation of his collections. He called it *Illustrations of Nuova Quinologia*

⁴⁹ Strickland, 'Quinine Pills'. ⁵⁰ Trease, 'Pierre-Joseph Pelletier'.

⁵¹ Kirkwood and Llyod, *John Eliot Howard*, 13–14.

⁵² Weddell, Markham and Karsten were French, British and German botanical explorers in the 'Cinchona forests' of South America from the early to mid-nineteenth century.

⁵³ J. E. Howard, *Illustrations of Nuova Quinologia of Pavon* (London: Lovell Reeve and Co, 1862). See also C. R. Markham, 'Preface', *Travels in Peru and India* (London: John Murray, 1862), v–x.



Figure 1.1 Photograph of a bottle of quinine bearing the label Howards and Sons, c.1860–1910, Credit: Wellcome Library, London.

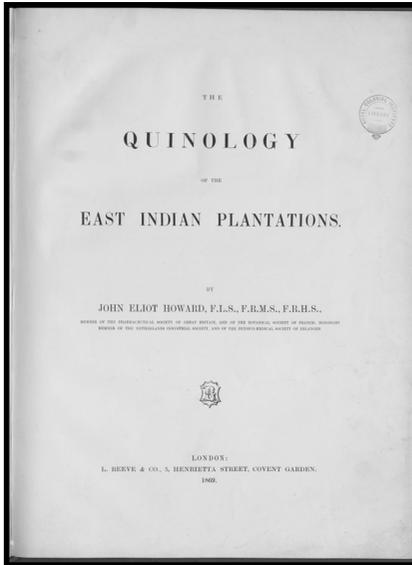


Figure 1.2 Title page of John Eliot Howard's *The Quinology of East Indian Plantations*, 1869. Reproduced by the kind permission of the Syndics of Cambridge University Library.

of *Pavon*. It was considered amongst the most important works available on the subject in English, and this was one amongst the many books on the cinchonas that he would eventually write. Howard maintained close ties with the Royal Botanic Gardens at Kew. *Neurva Quinologia of Pavon* was dedicated to the then-director of the Kew Gardens, Hooker senior. Incidentally, he dedicated his subsequent work (see Figure 1.2) published in 1867, entitled *The Quinology of the East Indian Plantations*,⁵⁴ to Hooker's son who had by then become influential at Kew.

Howard could also boast of thriving political connections. He acted as an advisor to the British Government in India for considerable lengths of time. Howard's nephew joined Howard and Sons in 1871.⁵⁵ He was the founder of Society of Chemical Industry as well as the Royal Institute of

⁵⁴ J. E. Howard, *The Quinology of the East Indian Plantations* (London: Lovell Reeve and Co, 1869).

⁵⁵ Nineteenth-century sources referred to this firm either as 'Howards and Sons' or 'Howard and Sons'. India Office correspondence that this book engages with used 'Howard and Sons' while referring to this firm. For the sake of consistency, in this book, I have used 'Howard and Sons' or 'the Howards' to refer to the firm, and 'Howard' to refer to the individual, John Eliot Howard.

Chemistry. His son David Lloyd Howard joined the family business in 1888. He followed the footsteps of his predecessors and set up the Association of British Chemical Manufacturers, Drug and Fine Chemical Manufacturer's Association and Wholesale Drug Trade Association.⁵⁶ The successes of the family in the field of quinine manufacture and circulation can only be studied in reference to such interconnected networks amongst the worlds of chemistry, commerce and politics. Over much of the nineteenth century the Howards were recognised as amongst the leading authorities in the science of quinine manufacture in the British Empire. They were also predominant players in most of the commercial ventures involving that commodity. I will explore in Chapter 4 the ways in which this explicit nexus between pharmaceutical capital and botanical knowledge played itself out.

In the late 1850s and early 1860s, quinine began to attract the attention of colonial governments in French Algeria, Dutch Java and British India. Medical commerce and colonial rule had long shared an intimate relationship.⁵⁷ The establishment of experimental cinchona plantations at various locations in these colonies converged with attempts to write credible histories of cinchona trees. Such histories formed parts of memoirs written by officials who were associated with the transfer of cinchona seeds and plants from South America to these British, Dutch and French colonies. Clements Robert Markham's *Travels in Peru and India* and Gustav Planchon's *Peruvian Barks* are amongst the most detailed texts in this genre of writing.⁵⁸ These narratives revealed themselves as long hagiographies of quinine. Different episodes involving two centuries of European association with forests in South America were repackaged variously as stories, legends, facts, rumours and incidents associated with quinine. The 'history' of the Peruvian forests that emerged from such narratives effectively conveyed the impression of indispensability of cinchona barks in curing various maladies. Quinine emerged retrospectively in these narratives as the precise cause that made cinchona trees valuable. Existing anecdotes from the annals of Spanish colonisation of Latin America were retold in the mid-nineteenth century as necessary components of broader pre-histories of quinine. Even when medical science was unaware of its existence, it was suggested, patients had benefited from quinine.

⁵⁶ Kirkwood and Lloyd, *John Eliot Howard*, 14.

⁵⁷ For instance P. Chakrabarti, *Materials and Medicine: Trade, Conquest and Therapeutics in the Eighteenth Century* (Manchester and New York: Manchester University Press, 2010).

⁵⁸ Markham, *Travels in Peru and India*, v-x. See also, G. Planchon, *Peruvian Barks* (London: George E. Eyre and William Spottiswoode 1866).

'An interval of only forty years intervened between the pacification of Peru and the discovery of its most valuable product', Markham wrote.⁵⁹ A Jesuit priest's recovery in 1600 mentioned by J. de Jussieu at Malacotas was now attributed to the curative powers of quinine. Similarly, quinine was retrospectively recognised in the writings of Clements Markham or Gustave Planchon as the unknown agent which famously cured Don Juan Lopez de Canizares, the Spanish Corregidor of Loxa in 1630 and the wife of the Fourth Count of Chinchon at Lima in 1638. Nineteenth-century narratives rewrote the penetration of Jesuit Acuna's fraternity into the forests bordering on the upper waters of the Amazon and subsequent formation of settlements as disinterested explorations in search of quinine.⁶⁰ Different varieties of drugs attributed to the cinchona barks (i.e. salutory powder, Countess's Powder, Jesuit's Powder,⁶¹ cinchona red, 'sel essentiel febrifuge')⁶² were now appropriated within the expansive history of quinine. These were now recognised as imperfect and lesser versions of 'pure, raw quinine'.⁶³

Quinine was also invoked to explain various contemporary political developments. Quinine was described as that medical wonder which could explain British military successes in expeditions in the Walcheren and along the river Niger, and the sustenance of troops from Peshawar to Pegu.⁶⁴ The use of quinine in earlier centuries, it was conjectured, could have '[change(d)] the history of the world'. Markham lamented that the 'greatest and most patriotic of England's rulers' could have lived longer had the use of quinine been current: 'Oliver Cromwell was carried off by ague'.⁶⁵ Even the death of Alexander the Great was explained in terms of the 'want of a few doses of quinine'.⁶⁶ Such overemphasis on the glory of quinine often led to the renaming of the tree and the landscape with which it was associated. In the mid-nineteenth century cinchona trees were often referred to as 'quinine trees'.⁶⁷ South American forests that were considered the natural home of cinchonas were designated as 'quinine forests'.⁶⁸ The cinchona-growing provinces of South America began being mentioned as the 'quinine region'.⁶⁹

At the same time, quinine was advertised as the cure for not only an extensive range of fevers, but also dysentery,⁷⁰ sore throat,⁷¹ alarming

⁵⁹ Markham, *Travels*, 3. ⁶⁰ *Ibid.*, 6. ⁶¹ Planchon, *Peruvian*, 1.

⁶² Markham, *Travels*, 17. ⁶³ Planchon, *Peruvian*, 34. ⁶⁴ Markham, *Travels*, 519.

⁶⁵ *Ibid.* ⁶⁶ *Ibid.* ⁶⁷ Planchon, *Peruvian*, 4–6.

⁶⁸ Anderson to Grey. *Home, Public*, 22 February 1862, 54–58 A., (NAI).

⁶⁹ Planchon, *Peruvian*, 6.

⁷⁰ J. Macpherson, *On Bengal Dysentery and Its Statistics* (Calcutta: Thacker, 1850).

⁷¹ D. J. Brackenridge, 'On the Use of Quinine as a Gargle in Diphtheritic, Scarlatinal, and Other Forms of Sore Throat', *Practitioner*, 15, 86 (August 1875), 110–114.

head symptoms,⁷² impotence,⁷³ and toothache⁷⁴, amongst other conditions. In view of such prestige subsequently endowed on quinine, the accomplishments of Pelletier and his colleagues in 1820 began to be considered a moment of great discovery in the standard histories of medicine. Markham wrote, 'This medicine, the most precious of all those known in the art of healing, is one of the greatest conquests made by man over the vegetable kingdom'.⁷⁵ The memory of the discovery of quinine in 1820 was carefully restored and magnified. To commemorate eighty years of the discovery a bronze statue of Pelletier and Caventou in their academic robes was erected in Paris in the Boulevard Saint Michel in 1900.⁷⁶ Figure 1.3 shows that Ernest Board celebrated the discovery again in the 1910s in an oil painting. Soon thereafter original samples of quinine and cinchonine attributed to Pelletier and Caventou began being displayed as a museum relic in exhibitions across London.⁷⁷ Further in 1970, a stamp was released to commemorate the 150th anniversary of the discovery of quinine.⁷⁸

'Pleasantest Episode of British Rule in India'⁷⁹

In the early 1860s, the event of discovery was invoked in many imperial narratives, which sought to justify the transfer of cinchona plants and seeds from various corners of South America towards possible destinations of colonial plantations in British India, French Algeria and Dutch Java. Published in 1862, Clements Robert Markham's *Travels in Peru and India* is one of the earliest and most widely cited amongst these accounts.⁸⁰ As a professional geographer, Markham was credited with having explored the forests of Peru and the frontiers of Bolivia much before the project had been conceived. In 1859, he was entrusted by the British government to lead an exploration into the interiors of the South American forests. The purpose of the expedition was to identify different

⁷² R. L. Bowles, 'Alarming Head Symptoms After Violent Exercise in Hot Weather, Relieved by Quinine', *BMJ*, 1, 34 (22 August 1857), 711.

⁷³ L. J. Jordan, *Specification of Lewis Jacob Jordan: Tonic* (London: Great Seal Printing Office, 1861) (WL).

⁷⁴ M. A. F. Mannons, *Specification of Marc Antoine Francois Mannons: Elixir* (London: Great Seal Patent Office 1862) (WL).

⁷⁵ Markham, *Travels*, 20. ⁷⁶ Trease, 'Pierre-Joseph Pelletier'.

⁷⁷ 'Original Preparations by Pelletier', (Credit: Wellcome Library, London. M0011461).

⁷⁸ Haas, 'Pierre Joseph Pelletier'.

⁷⁹ D. Hanbury, 'Review of a Memoir of the Lady Ana de Osorio, Countess of Chinchon and Vice-Queen of Peru with a Plea for the Correct Spelling of the Chinchona Gneus by Clements R. Markham' in D. Hanbury, *Science Papers: Chiefly Pharmacological and Botanical* (London: Macmillan and Co, 1876), 475.

⁸⁰ Markham, *Travels*, v-x.

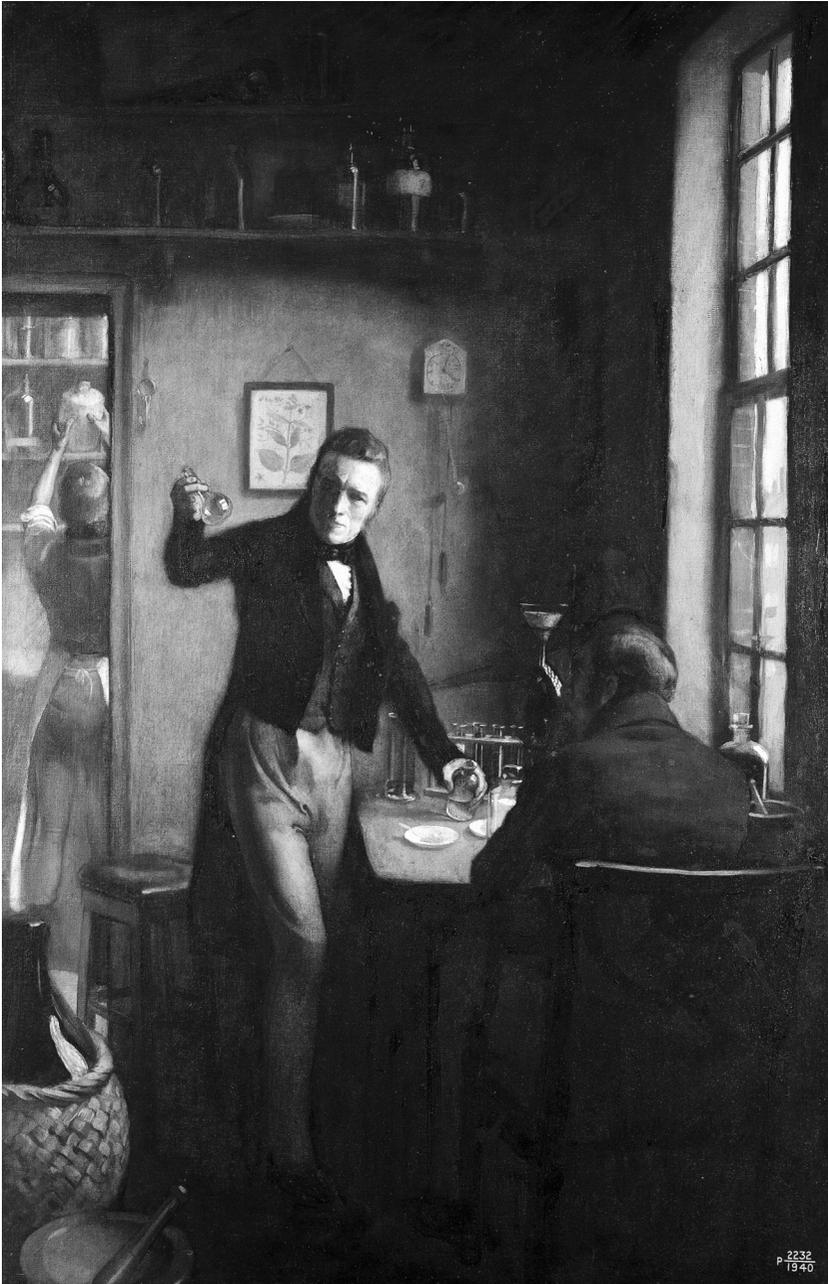


Figure 1.3 Oil painting of Pelletier and Caventou discovering quinine by Ernest Board, c. 1910–20. Credit: Wellcome Library, London.

species of cinchonas in their natural habitats. Seeds and plants belonging to these different varieties were then to be shipped towards the British ports in India. Markham spent most of his time exploring the forests of the Peruvian province of Carabaya. Botanists claiming almost equal experience in the region assisted Markham. Richard Spruce engaged himself in Chimborazo, Robert Cross explored New Grenada while G. J. Pritchett traversed the forests of Huanuco and Huamalies.⁸¹ Existing works have already explored in great detail the challenges faced by them during this expedition.⁸² This section closely reads from *Travels in Peru and India* to reveal the ways in which Markham was justifying efforts to establish cinchona plantations in British India. It argues that travel accounts like this reinforced the image of cinchonas as valuable items.

In Markham or Planchon's accounts these plants figured not only as objects of enduring botanical interest, but also as commodities which were in great demand in the 1850s. Cinchonas were described as sources of enormous revenue. For instance, Markham mentioned that from the four Bolivian ports of Arica, Islay, Payta and Guayaquil, the export of cinchona barks in 1859 amounted to around 912,900 lbs, which was valued at £59,076.⁸³ Such obvious commercial significance was further underscored by predictions that the world's only natural cinchona reserves (in South America) were on the verge of extinction. Markham blamed the Spanish governments in South America and the republics that succeeded them for their mismanagement of the only natural cinchona reserves in the world. These governments had allegedly failed to control an unbridled trade in cinchona barks.⁸⁴ This, he argued, had set the stage for the exhaustion of the cinchona trees. He projected the fear of the depletion of the cinchona trees altogether in view of enormous yearly exports of cinchona barks. Markham suggested that the British were not alone in their concern about the possibility of imminent extinction of the cinchona trees in their natural homeland. French, Dutch and Spanish explorers in the South American forests since the mid-eighteenth century (beginning with La Condamine, Humboldt and Ruiz) had supposedly predicted the exhaustion of cinchona trees.

Markham argued that many French, Dutch and British botanists and explorers, amongst his contemporaries, had proposed the cultivation of cinchonas in colonial plantations elsewhere as a means to protect these

⁸¹ Planchon, *Peruvian*, 45–46.

⁸² Philip, *Civilising Natures*, 238–272; Brockway, *Science and Colonial Expansion*, 112–117.

⁸³ Markham, *Travels*, 571–572.

⁸⁴ C. Perez, *Quinine and Caudillos: Manual Isidoro Belzu and the Cinchona Bark Trade in Bolivia, 1848–1855* (unpublished doctoral dissertation, University of California at Los Angeles, 1998); Brockway, *Science and Colonial Expansion*, 111.

plants from extinction. Dr Forbes Royle, reporter on Indian Products to the East India Company, as early as 1839 in his *Illustrations of Himalayan Botany*, recommended the introduction of cinchona plants from South America to different parts in India.⁸⁵ Markham pointed out that similar experiments were recommended by botanists and explorers Dr Weddell, M. Delondre and M. Fee in the French colonies, particularly in Algeria in the 1840s, and that earlier amongst a host of Dutch botanists, Blume had insisted on the introduction of cinchona plants into Dutch Java.⁸⁶ Thus, Markham described the transplantation of cinchonas in the Dutch, French and British colonies as a response to a shared imperial anxiety.

The arrival of these valuable sources of quinine within a few years after the Sepoy mutiny of 1857, it was claimed, would initiate the 'pleasantepest episode of British rule in India'.⁸⁷ Cinchonas were upheld as objects which symbolised the benevolent transition of imperial power in British India from the East India Company to the Crown.⁸⁸ By being a part of the process of bringing cinchonas to India, Markham imagined himself as engaged in an everlasting service to the colonial poor in India:

Thus England will leave behind her by far the most durable monument of the benefits conferred by her rule. The canals and other works of the Moguls were in ruins before the English occupied the country; but the melons which the Emperor Baber, the founder of the Mogul dynasty, introduced into India, and which caused him to shed tears while thinking of his far-off mountain home, still flourish around Delhi and Agra. Centuries after the Ganges canal has become a ruin, and the great Vehar reservoir a dry valley, the people of India will probably have cause to bless the healing effects of the fever dispelling chinchona-trees, which will still be found on their southern mountains.⁸⁹

He suggested that the British imperial project of extracting cinchonas from the interiors of South American forests was not only justified, but also legitimate. Markham refused to view the introduction of cinchona plants from South America to South India as a radical break from the past. It appeared to be part of a longer history of continuous travel of commodities from South America and their subsequent domestication in India:

India owes to South America the aloes which line the roads in Mysore, the delicious anonas, the arnotto-tree, the sumach, the capsicums so extensively used in

⁸⁵ D. Williams, 'Clements Roberts Markham and the Introduction of the Cinchona Trees into British India, 1861,' *The Geographical Journal*, 128, 4 (December 1962), 432.

⁸⁶ Markham, *Travels*, 46. ⁸⁷ Hanbury, 'Review of a Memoir', 475.

⁸⁸ Philip, *Civilising Natures*, 240, 256–267; Drayton, *Nature's Government*, 231.

⁸⁹ Markham, *Travels*, 61.

native curries, the pimento, the papaw, the cassava which now forms the staple food of the people of Travancore, the potato, tobacco, Indian corn, pine-apples, American cotton, and *lastly, the chinchona*: while the slopes of the Himalayas are enriched by tea-plantations, and the hills of Southern India are covered with rows of coffee trees.⁹⁰

At the same time, he dispelled apprehensions that the establishment of cinchona plantations in British, Dutch or French colonies would injure the cinchona trade controlled by Peru and Ecuador.⁹¹ On the contrary, Markham argued that the setting up of the colonial plantations in distant parts of the imperial world was conceived as pedagogical measures, which would eventually benefit the South Americans themselves. Competitions with the barks produced in the Indian and Javanese plantations, he hoped, would teach them to appreciate the value of the cinchona trees more than ever before. This in turn would inspire them to carefully preserve and protect these trees in their immediate locales. Once the cinchona plantations in Java and South India bloomed, Markham envisioned, the South Americans would benefit from such experiences. Beyond the enclaves of naturally sprouted forests, Markham thought, the South Americans would then learn to grow and rear cinchonas within enclosed and manicured spaces of plantations. Therefore in the abstruse logic of colonial exchange, he eventually situated the South Americans as beneficiaries:

Hitherto they have destroyed the chinchona trees in a spirit of reckless short sightedness, and thus done more injury to their own interests than could have possibly arisen from any commercial competition; but it may be that the influence of peace and education will inaugurate a new system in time to come, that more enlightened views will prevail, and that they themselves may undertake the cultivation of a plant which is indigenous to their forests, but which up to this time they have most foolishly neglected. It will then be a pleasure to supply them with the information which will have been gained by the experience of cultivators in India, and thus *to assist them in the establishment of plantations on the slopes of the eastern Andes*.⁹² (Emphasis mine.)

Moreover, cinchonas were situated by Markham at the heart of an unwritten contract. He argued that the British government in India exercised a legitimate right over the cinchonas that grew in South America:

Under any circumstances the South Americans, who owe to India the staple food of millions of their people, and to the Old World most of their valuable products – wheat, barley, apples, peaches, sugar cane, the vine, rice, the olive, sheep, cattle,

⁹⁰ Ibid., 60. ⁹¹ Ibid., 338. ⁹² Ibid.

and horses- have *no right to desire to withhold* from India a product which is so essentially necessary to her welfare.⁹³ (Emphasis mine.)

Representing the British Empire in South America, Markham could hardly afford to be sympathetic to the memory of Spanish colonialism. He dedicated three chapters in his *Travels in Peru and India* towards detailing the exploitative aspects of Spanish rule.⁹⁴ Markham claimed to read the minds of the Peruvian Indians better than their immediate or erstwhile rulers. He suggested that the Peruvians had communicated to him their will 'to promote a friendly interchange of the products of the New and Old worlds'.⁹⁵ He explained that the many acts of resistance to these British, French and Dutch ventures were results of shrewd instigations engineered by short-sighted, local officials:

The foolish decree issued in Ecuador on the 1st of May, 1861, as well as the numerous obstructions thrown in my way in southern Peru, may be imputed either to the narrow minded selfishness of half educated officials; or to the ignorant patriotism of backwoodsmen. These are feelings that are not shared by either the educated few, or by the Indian population.⁹⁶

As an object of circulation, cinchona plants performed considerable commercial, epistemological and ideological functions for the British Empire in India in the late 1850s and early 1860s. In the memoirs of imperial handlers like Markham, these plants figured as what Harold Cook calls a 'matter of exchange', which South Americans could share with the wider imperial world in return for necessities, knowledge and goodwill.⁹⁷

Distant and Delicate

Travel memoirs, bureaucratic reports, sketches and paintings were amongst the sites where the journey of the cinchonas from South America to various parts of British India was narrated. These narratives entwined intimate descriptions of the fragile physicality of these plants with ceaseless suggestions about their exalted status as valuable commodities in British India. Detailed accounts of the hardships involved in transporting a delicate plant from a distant part of the world tended to underscore the exotic value of the cinchonas. To that extent, cinchonas were hardly exceptional amongst attention-seeking commodities

⁹³ *Ibid.*, 338–339. ⁹⁴ *Ibid.*, vi. ⁹⁵ *Ibid.*, 339. ⁹⁶ *Ibid.*

⁹⁷ H. J. Cook, *Matters of Exchange: Commerce, Medicine and Science in the Dutch Golden Age* (New Haven: Yale University Press, 2007).

in nineteenth-century British India. Drugs that were preferred as reliable in the official files were often projected as exotic items. Such items were shown to bear strains of travel from distant places. Colonial officials often reported on 'local medicines' circulating in the interior bazaars of India. These reports claimed that because these drugs remained confined within the immediate locality, the charm associated with them was often depreciated by quotidian access. Easy rejections of these conveniently accessible drugs were based on the claim that their uselessness had been revealed or exposed.⁹⁸ In contrast, drugs that were advertised as exotic confidently carried with them the untested promise of offering more effective cure. One of the most common tropes in Bengali medical advertisements in the 1850s, for instance, involved stating the names of distant places from where certain drugs were imported. Such advertisements even mentioned the names of the ships and vessels that carried them into British Indian ports. The value of drugs was often asserted by hinting at the journeys they had undertaken.⁹⁹

Similarly, the distant origins of cinchonas were recurrently reemphasised in course of the second half of the century. Increasing circulation across British Empire of sketches of the interiors of cinchona forests (see Figure 1.4) and maps of the extensive 'cinchona region' in South America converged with descriptions by geographers like Markham of various stages of the long, and often perilous journey which the plants underwent.¹⁰⁰

... When the unprecedented length of the voyages and the numerous transshipments are taken into consideration, the wonder is that any of the plants should have been successfully conveyed from the slopes of the Andes in South America to the Ghats in Southern India, over thousands of miles, through every variety of climate, subject to the risk of crossing the isthmus of Panama, of changing steamers at the island of St Thomas, at Southampton, at Suez, and at Bombay, and of the journey through Egypt... The most important introduction of plants into India...¹⁰¹

⁹⁸ A. Smith, *Notes on the Principal Plants Employed in India, on Account of their Real or Supposed Febrifuge Virtues*, quoted in Markham, *Travels*, 546–565. See also J. Macpherson, *Quinine and Antiperiodics in Therapeutic Relations Including an Abstract of Briquet's Work on Cinchona and a Notice of Indian Febrifuges* (Calcutta: R. C. Lepage, 1856).

⁹⁹ For example see the following advertisements published in the Bengali newspaper *Sambad Purna Chandroday*. 'Messrs Nosky and Co Druggists', *Sambad Purna Chandroday*, (8 May 1850), 1 and 'D N Paul and Co', *Sambad Purna Chandroday* (25 December 1850), 1.

¹⁰⁰ 'Map showing Cinchona region of the Andes, South America' from C. R. Markham, *Peruvian Bark* (London: John Murray, 1880). Credit: Wellcome Library, London, L0025458.

¹⁰¹ Markham, *Travels*, 324, 334–335.



Figure 1.4 Wood-engraving by Charles Laplante, c. 1867. Credit: Wellcome Library, London.

Such narratives of global travel revealed the cinchonas as invaluable and mortal. The physical stresses suffered by these plants in circulation were elaborated rather than concealed. The transformation of these cinchonas' corporeal properties during transit upheld them as lively, responsive, sensitive organisms and not as eternally stable and vacuous objects. These travelling cinchonas were ascribed various anthropomorphic features in the official files: they often died, but when they didn't die, they lived; even if they barely survived, got injured, turned sickly and got their identities messed up.¹⁰² At the same time, these hostilities encountered by the plants were indicative of the length of the difficult journey. For instance, Mr Pritchett, an agent engaged by Markham, had transmitted a 'valuable assortment of seeds', consisting of varieties denominated as *cinchona micrantha*, *cinchona nitida* and *cinchona peruviana* from Lima to Bombay. It was reported that the seeds had to wait at Lima for six weeks and at Bombay for another twenty-seven days, and in the process lost some of their vital properties. D. Macpherson, the Inspector

¹⁰² Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

General of Hospitals, on special duty at Ootacamund found it difficult to distinguish between them.¹⁰³

The reports conveyed a sense of precision involving the meagre numbers of plants that survived the journey. Such frequent reference to numbers reinforced the impression that cinchonas were not only therapeutically invaluable but also numerically rare and exotic items in British India. It was reported, for instance, that only 400 plants belonging to the *Cinchona Calisaya* species collected by Markham in South America made it to Ootacamund in South India. Even these died shortly thereafter. Amongst the first batch of plants and seeds shipped from South America by collectors Cross and Spruce only 463 of the *Succirubra* species and six belonging to the Calisaya species survived the journey and reached Ootacamund on 9 April 1861.¹⁰⁴ These indicated that plants which had shown extraordinary resilience to survive the vagaries of the journey were noteworthy, rare and valuable commodities, and commanded careful attention. Thus, the value of cinchonas seems to have been aggravated by awareness of the distance which they were made to traverse. The impression about the indispensability of the cinchonas in British India was produced and reconfirmed by the desperation of the government to access these plants despite such numerous difficulties.

Besides, the firmer recognition of cinchona in the official records as a valuable commodity was also closely linked to its feminisation. The ascription of feminine attributes to these plants was not restricted to William Dawson Hooker's description of the cinchonas as 'the fairest of Peruvian maids',¹⁰⁵ or to the designation of carefully showcased cinchona barks on display in London exhibitions as beautiful.¹⁰⁶ In bureaucratic correspondence they were often projected as delicate plants. This was the most recurrent trope to reinforce the femininity of the cinchonas. The value of cinchonas was reinforced by its representation as a delicate item. The word *delicate* could have multiple connotations: fragile and subtle; vulnerable and graceful. Thomas Anderson, the then Superintendent of the Botanic Gardens at Calcutta, for instance, seems to have had knowledge 'of the difficulties attending the transporting of so *delicate plants* by long sea voyages and especially of the trying journey in the Red Sea [emphasis mine]'.¹⁰⁷ However, the cinchonas could as

¹⁰³ D. Macpherson, to J. Boudillon, No. 7, 5 February 1861, Ootacamund. Home, Public, 25 April 1861, 34–35 A (NAI).

¹⁰⁴ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

¹⁰⁵ Hooker, 'Title page', *Inaugural Dissertation*.

¹⁰⁶ Anonymous, 'The Cinchona Plant', *The Brisbane Courier* (Saturday, 8 February, 1868), 6 <http://trove.nla.gov.au/ndp/del/article/1318474> [retrieved on 26 December 2012].

¹⁰⁷ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

well display their delicate character whilst in transit through more tranquil waters. The image of cinchona as a delicate plant survived till the late 1860s. Captain W. J. Seaton, Conservator of forests, British Burma, informed: 'A fresh batch of plants was received from Ootacamund, and the glasses, in crossing, were again broken and the plants killed . . . finally 12 only reached Tounghoo alive, most of them having been killed by *over watering* on the way up the Sittang river . . . Eight were at last planted in Bogalay [emphasis mine]'.¹⁰⁸ In view of the 'delicate' nature of cinchona plants, Anderson had prescribed strict instructions for carrying them during inland transit. 'Each case requires *eight men*. It is of greatest importance that the plants should not be shaken in the transport, nor should be exposed to the sun [emphasis mine]'.¹⁰⁹ The delicate features of these plants were underscored by projecting them as 'sensible' to variations of temperature and altitude. 'They are extremely *sensible* to a greater or lesser degree of heat, humidity, shade etc so that the slightest departure from the mean of these influences (for example, a height more or less elevated by 500 feet) exercises a visible influence on the condition of trees, and this *sensibility* varies with each species of the Cinchona [emphasis mine]'.¹¹⁰

Cinchonas were designated as feminine plants, which required careful handling by imperial men almost at every step. The imperial gestures of possessing, rescuing, collecting, protecting, transporting and receiving cinchona plants, it was suggested, were chivalrous and masculine. The imperial projection of cinchonas as invaluable commodities was sustained and invigorated by the recurrent description of the physicality of these plants as distant, rare and delicate in myriad sources. The circulation of this 'Peruvian maid' to distant corners of the colonial world was advertised as an accomplishment more glorious than even the introduction of tea from China into India in 1849.

Geographies of Plantations: Anderson in Java

The imagining of cinchonas as rare and valuable was not restricted to narratives describing the journeys of these plants from South America to British India. Bags containing cinchona seeds and plants reached South India from different ports in Peru, Bolivia, Ecuador or New Grenada by

¹⁰⁸ W. J. Seaton to Secretary, Chief Commissioner, British Burmah, PWD. Home, Public, 4 July 1868, 57–63 A (NAI).

¹⁰⁹ T. Anderson to E. H. Lushington, 6 March 1862. Home, Public, 14 April 1862, 122–125 B (NAI).

¹¹⁰ Dr Junghuhn to the Governor General of Netherlands India, 23 October 1861, Lombok. Home, Public, 16 December 1861, 26–30 A (NAI).

the early 1860s. The construing of the physicality of cinchonas as distant, sensitive and delicate persisted through the course of the 1860s. The enduring impression that these exotic mortals survived only in certain specific geographical situations meant that they could not be planted just anywhere in British India. The selection of suitable sites for the cinchona plantations was a long, complex and contested process. It preoccupied botanical debates, bureaucratic travels and plantation experiments over much of the decade. Such elaborate efforts to 'maintain'¹¹¹ cinchonas in British India conveyed the impression that these plants were not only fragile, but also invaluable.

The issue of where cinchona plantations could be established in British India became a contested topic. Thomas Anderson, the Superintendent of the Botanic Gardens in Calcutta, in an early official correspondence drafted in 1859, tended diligently to conform to the opinions of best known explorer-botanists in India who had visited the cinchona forests in South America.¹¹² This led to the search for localities in India that could be thought to resemble the landscapes and climates where cinchonas were 'indigenous'. This was preceded by two puzzling questions. The one asked what the climates prevalent in the natural cinchona forests were like, and the other, how could the landscape that was supposed to support such forests be accurately described.

The opinions of botanists, explorers and agents who had visited the natural cinchona forests in South America were solicited. The perceived delicate physicality of the cinchonas, in turn, conferred on Markham, Cross, Spruce, Pritchett unforeseen authority. Their roles did not end with despatching different varieties of cinchona plants and seeds to India. Instead, their status graduated from bearers of seeds and plants to custodians of knowledge about the cinchonas in British India. They were entrusted with locating sites in British India, which apparently resembled South American forests closest. In this process, Markham emerged as one of the most influential figures associated with cinchona planting endeavours in South India in the 1860s. Markham's travel accounts bore elaborate justifications for selecting certain locations in the Madras presidency as suitable for the survival of the cinchonas.

Meanwhile cinchonas continued to acquire newer sets of authorities. The expertise of explorers like Markham in the geographies of cinchonas was effectively contested since Thomas Anderson's return from his deputation to Java in February 1862. It began as a clash over authority

¹¹¹ Latour, 'Whose Cosmos'.

¹¹² T. Anderson to the Secretary, Government of Bengal, No. 193, 6 September 1859. Home, Public, 13 January, 1860, No. 18–27 A (NAD).

between explorers who had known the cinchonas in the 'natural forests' of South America and officials who were aware of the conditions in which artificial plantations in Dutch Java thrived. In 1862, Dutch Java was the only place in the world, other than South America, where cinchonas grew. Only in Dutch Java were cinchonas cultivated in plantations. In successive reports, Anderson revised his earlier opinions, emphasising the relevance of lessons acquired in the cinchona plantations in Java in deciding upon suitable sites in British India. Anderson was one of the very few British officials deputed to visit Java, and he underscored the relevance of this precious experience in determining the possible locations of plantations in British India.¹¹³

Anderson reported that as early as 1862 about 8000 plants of *Cinchona Calisaya* and more than half a million plants of the species *Cinchona Pahudiana* were already thriving in the Javanese plantations. He further noted that some of those, which had been planted five or six years earlier, had already grown up to acquire a height of about 25 or 30 feet. The successes witnessed in these plantations were explained in terms of the exceptional characteristics of Javanese landscape and climate. In his travel account, the cinchonas reappeared as a valuable breed of plants because the terrain that housed the plantations in Java was relatively rare. Anderson's journeys in search of the cinchona plantations in Java brought him to the foothills of volcanoes, and his narrative showed his experience of the interiors of Java as an engagement with an active landscape. While travelling between plantations he appeared to be moving from one volcanic site to another.¹¹⁴

The causes behind the proliferation of cinchona trees in Java, Anderson suggested, was inherent in the natural history of the region. The 'meteorology, botany and geology' of the Javanese mountains seems to have been characterised by strange blends. Such features appeared distant and different from Anderson's familiar world. These rare enmeshes, it was claimed, were typical of the regions where the cinchonas survived. The rarity of such regions in British India, it was suggested, made cinchonas a precious group of plants.

Anderson pointed out that the principal plantations were located on the Kendeng and Malabar range of mountains in the southern portion of the islands in the vicinities of the plateau of Bangdong. The altitude of such mountains varied from 2000 to 7000 feet above the sea.

¹¹³ Anderson to Grey, Home, Public, 22 February 1862, 54–58 A (NAI).

¹¹⁴ Ibid.; T. Anderson to W. Grey, No. 326, 4 December 1861. Home, Public, 16 December 1861, 26–30 A (NAI).

He found the landscape equally conducive for the sustenance of dense 'natural forests' and plantations. The 'natural' and the 'agricultural' conveniently merged to constitute the surrounding vegetations. Gigantic trees, typical of the Malayan archipelago, formed the bulk of the vegetations of these forests. Anderson thought that such trees were often 150 or 180 feet high. He found that 'beautiful and extensive coffee plantations' and craters of active volcanoes frequently broke continuities of these dense forests. Anderson noted that as he ascended along the plantations 'through the dripping forests', the eclectic features of the existing vegetations struck him. Tropical forms of trees appeared to intimately mingle with the temperate species like the rhododendrons. Trees ascribed to the American genus *Gaylussacia* and those apparently belonging to the Himalayan genus *Astilbe* appeared to closely coexist with 'gregarious volcanic plants'.

Anderson noted that such curious blends could also be witnessed in the weather prevalent usually in the cinchona plantations of Java. Anderson found them similar to what Karsten had written about the Andes or the way Mr Pritchett described the forests of Huanaco. 'At one moment, a raging tempest of rain and wind; at another, the calm, tranquil, laden atmosphere of chilling cloud and fog...' 'The misty regions of the Andes, where . . . constant rain is interrupted in the day by interchanging sun rays and fog clouds . . .'. It appears from Anderson's account that the weather prevalent in the Javanese plantations witnessed a constant interplay of light and shade: frequent rainfall, interrupted by dazzling beams of sunlight, followed once again by steady formations of gloomy clouds. The weather compatible with the sustenance of the cinchonas in the plantations, according to Anderson's engaging narrative, revealed such rigidly repetitive patterns.¹¹⁵

In the travel narratives of this British Superintendent of the Botanic Gardens in Calcutta, Javanese cinchona plantations thrived on a landscape which bore the scars of numerous volcanoes. It was represented as a rare region where apparently contradictory features in weather and vegetations could conveniently coexist. These features, he claimed, conformed to his readings of what botanists and explorers wrote about the 'natural cinchona forests' in South America. Anderson attributed the successes of the cinchona plantations in Java to these exceptional features in its landscape. Anderson's narrative suggested that the cinchonas were not merely a distant and delicate group of plants. The landscape, the weather and surrounding vegetation, which sustained their survival,

¹¹⁵ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

would be difficult to locate in British India. In the relative absence of such geographic characters, Anderson sounded uncertain about the prospect of cultivating cinchona in British India:

There can be no doubt that, on the whole, there will be greater difficulties to contend with introducing Cinchona into India than have been experienced by the Dutch in Java. Dense forests possessing a moist climate do not occur extensively in South India at elevations from 3000 to 6500 feet high, which may be taken roughly as the two extremes at which the cultivation of the species of Cinchona would be most successful.¹¹⁶

Tours of Ambition

Thus, on his return from Dutch Java, Anderson questioned the selection of Dodabetta and Neddivattum as sites for cultivating cinchonas in the Nilgiris in South India by Markham and his associates. Anderson argued that these selections followed neither the lessons learnt from the 'natural cinchona forests' in South America nor the plantations in Dutch Java. Opinions varied as to what were the ideal conditions for cinchonas to thrive. Anderson's understandings often clashed with those of Markham, Spruce or Cross, and he emphasised the relevance of the knowledge learnt from Java over the experiences of those others. Anderson considered, for instance, the practice initiated by Markham of planting the cinchonas in the open, without any form of shade to guard them from the scorching rays of the sun, unacceptable. He confirmed from the writings of travellers into South America like Weddell and Karsten as well as the experiences of the Dutch in Java that cinchona plants only survived when they were accommodated within an existing 'natural forest'. At Neddivattam, Markham had instructed the clearance of 50 acres of forest from trees to plant cinchonas without shade. Thus, Markham was about to deprive Neddivattam, feared Anderson, of one of the essential conditions for the survival of the cinchonas, that is, continuous luxuriant vegetation.¹¹⁷

Anderson argued that the selection of Dodabetta and Neddivattum as sites for plantations were based on 'a very erroneous idea of climate'. Unlike South American cinchona forests or the Javanese plantations, the vegetation in the Nilgiris, Anderson thought, suffered from long continued droughts. Here, Anderson missed the large luxuriant sections of *Dendrobium*, *Cymbidium* and *Vanda*, as well as the perennial terrestrial orchids of the moist Java forests. He found the climate in Dodabetta and

¹¹⁶ Anderson to Grey. Home, Public, 16 December 1861, 26–30 A (NAI).

¹¹⁷ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

Nedivattam ‘too dry’ in comparison to the data furnished by Markham himself on the Caravayan forests in South America. The altitudes of the selected sites, noted Anderson, were much higher than what suited these plants. He alleged that the site selected for planting *Cinchona Calisaya* at Ootacamund by Markham was 1500 feet above the highest elevation at which that species survived in Bolivia, and 2000 feet above the highest limit at which it had been possible to cultivate it in Java.

Anderson’s prediction about the fate of those plants was precise: ‘The young plants will most certainly be lost’.¹¹⁸ Similarly, he pointed out that plants belonging to the *Succirubra* species at the government garden at Ootacamund turned ‘sickly’. Those were planted ‘at least 2500 feet above their highest limit’, he reasoned.¹¹⁹ Anderson argued that exposure to adverse climatic conditions were reflected in the poor health of these plants. It was suggested that in comparison to the plants grown in Java, the South Indian cinchonas suffered from a lack of vitality. After having received a group of cinchona plants each from Java and Ootacamund in Calcutta in August 1862, Anderson wrote:

Out of fifty nine plants obtained from Java only one death occurred, while of the 170 plants from Ootacamund no less than thirty were completely lost. *This difference in the healthiness of the plants from the two places* becomes more striking when it is known that the plants from Java were brought by Coolies from the mountains in the interior of the Island to Batavia and thence by steamer to Calcutta; while those from Ootacamund were transported in twelve hours by Railway over most of the land journey, and the Sea voyage only lasted three days. The plants from Java were in addition exposed for two months longer than the others to the confinement of small pots and wardian cases as they arrived in Calcutta two months before them . . .¹²⁰

Thus, Anderson’s enchantment with cinchonas was, yet again, founded on the invocation of the delicate physicality of these plants. The puzzlement with locating suitable sites for rearing cinchonas in British India augmented them not only as an exclusive group of plants, but also as sensitive and living bodies which survived only in specific geographical conditions. The incorporation of the cinchonas within the colonial plantation economy, Anderson implied, was an intimately corporeal experience for these plants. As in the case of displaced indentured labourers, Indian soldiers in the British Indian army, or European colonisers, efforts to acclimatise cinchonas in an alien landscape was informed by

¹¹⁸ Anderson to Grey. Home, Public, 16 December 1861, 26–30 A (NAI).

¹¹⁹ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

¹²⁰ T. Anderson, ‘Report on the Cultivation of the Quineferous Cinchonae in British Sikkim from the 24 March to the 1 August 1862’. Home, Public, 13 September 1862, 30–31 A (NAI).

concerns of preventing deaths and sickness, and ensuring 'healthiness' and productivity. I will continue to explore in the following section how mystification of cinchonas persisted with attempts to assist these plants to survive in an unfamiliar landscape.

Anderson's scathing remarks regarding the efforts of Markham performed other functions. Such acts of contrasting the climates and landscapes of South India with Java and South America were not disinterested exercises in comparative geography or a selfless clash of botanical opinions. It also reflected a clash of ambitions in a struggle over whose expertise was best suited to the management of the cinchonas in British India.¹²¹ Thus, cinchonas revealed tensions within the botanical establishment in British India.

Anderson's remarks were carefully framed towards contesting Markham's claims as the leading authority of knowledge about the cinchonas in British India. Dr Junghuhn was the Principal Inspector of the cinchona cultivation at Dutch Java. In view of the highly advertised successes in the Javanese plantations, he had begun to command enormous prestige in the world of knowledge about the cinchonas. He wrote the following letter in support of Anderson's abilities. Anderson attached excerpts from this letter ahead of the detailed account of his trip of Java.

... Dr Anderson, ... now understands the climate and the character of the forests in which the Cinchonas at Java grow in great fertility; ... is acquainted more than any other person in British India with all the peculiarities of our method of cultivating and transplanting the Quinine trees in the forests, and ... in consequence possesses all the necessary qualifications for the superintendence and general direction of the Quinine culture in British India.¹²²

In response, Spruce, one of Markham's associates in South America wrote from Guayaquil in 1862 defending the latter. He implicitly alleged Anderson for his ignorance of the 'native conditions' that reared the cinchonas in South America.

... Mr Markham's notions on the cultivation of Cinchonae entirely coincide with my own ... If some empiric who has never seen the Cinchonae in their native country, has sufficient influence to inform the Indian government to attempt to cultivate Cinchona plants accordingly then let him be responsible for the result ...¹²³

¹²¹ Ibid.

¹²² Junghuhn to Governor General of Netherlands India. Home, Public, 16 December 1861, 26–30 A (NAI).

¹²³ Mr Spruce, 'Note on the cultivation of Cinchonae', (Chandug near Guayaquil, June 1862). General, General. 14–16 A, September 1862 (WBSA).

Hetero-Genus: Cinchona 'Experiments' in British India

Published in the same year, Markham's *Travels in Peru and India* was much less polemical. He was more interested in the eclectic facets of the landscapes through which he travelled in and around the Nilgiris. Each new spot in the Nilgiris reminded him of different places he had encountered during his extensive travels as an explorer. As he travelled from the port at Calicut towards Ootacamund he felt that 'the whole scene bore a close resemblance to one of Sandwich or Society Islands'.¹²⁴ Further into the interior, rows of betel nut plants reminded Markham of palm trees on familiar settings in 'the South Sea Islands or the forests of South America'.¹²⁵ On reaching Dawson's hotel at Ootacamund he found it difficult to persuade himself that he was 'not again in England'. The hotel was located amidst gardens and plantations of Eucalyptus, with trees introduced from Australia around them.¹²⁶ However, such 'English associations' faded as he walked merely a few miles away from Ootacamund. Instead, 'there was much' that made him feel that he had returned amongst the Pajonales in the 'Chinchona region of Caravaya'.¹²⁷

Bureaucratic exoticisation of cinchonas in British India converged with the realpolitik of plantations. In the process, the cultivation of cinchonas was projected as both difficult and yet plausible. Cinchona plants figured in the official files as both alien and yet increasingly adaptable in British Indian landscapes. Material properties of cinchonas as well as the textures of certain landscapes appeared suitably malleable.

In Markham's writings the Nilgiris figured as a landscape with myriad facets and possibilities, which the European investor could intervene and mould at his will. He mentioned that with the aid of 'an East Indian foreman and labourers from the Mysore plains', William G. McIvor, the Superintendent of the Botanic Gardens at Ootacamund, had converted 'the wild mountain sides into a beautiful public garden', consisting of English fruits, flowers, vegetables and grasses.¹²⁸ Similarly, Markham indicated how several extensive European estates of coffee had emerged near Coonoor. He therefore found no reason to doubt that the 'English capitalist would make large and rapid profits' by cultivating cinchonas in the Nilgiris.¹²⁹

Such hope converged with attempts to characterise the cinchonas as a widely heterogeneous family of plants. It has already been shown how official narratives presented the cinchonas as delicate plants. They were shown to grow in climates that were relatively unfamiliar to British

¹²⁴ Markham, *Travels*, 341. ¹²⁵ *Ibid.*, 349. ¹²⁶ *Ibid.*, 356–357. ¹²⁷ *Ibid.*
¹²⁸ *Ibid.*, 371. ¹²⁹ *Ibid.*, 378.

officials in India. These plants appeared as rare and exotic in India. Such projections added to the aura associated with them. At the same time, officials continued to explore the possibility of cultivating cinchonas in British India. To that end, cinchonas figured as a botanical genus that comprised of different varieties of species, which survived in diverse conditions. Such understandings questioned the apparent rigidities within certain prevalent geographies of cinchona.

Official files mentioned at least twenty different varieties of cinchonas.¹³⁰ Basic physical attributes were supposed to vary extensively amongst the different species of cinchonas. Thomas Anderson was delighted to note the 'profusion of flowers' in certain varieties of cinchonas. He was, however, amazed by the absence of flowers in some others.¹³¹ J. Broughton, the Government Quinologist at Ootacamund, pointed out a few years later that the vigour of growth, size of trees and content of quinine varied in the different varieties of cinchonas, adding that such qualities might manifest differently within the same species when exposed to different conditions.¹³²

In official correspondence, such inherent diversities were frequently invoked. This enabled officials to assert that different varieties of these plants thrived in an extensive range of climatic conditions.¹³³ There could hardly, then, be any specific locality in British India that could rear every variety of cinchonas within the shared space of a single plantation. However, different localities in British India, it was hoped, might prove suitable for the survival of different species of cinchona. The difficult task confronting the officials was to suggest comfortable localities for every species considered rich in quinine.

A report was solicited in September 1859 from W. Jameson, the Superintendent of the Botanic Gardens, North Western Provinces, on the 'best localities for cultivating cinchonas in North Western Provinces'. He recommended a range of different sites suitable for each variety of cinchona.¹³⁴ Anderson was also drawn into these discussions and speculated on possible sites for different varieties:

There is an abundance of localities obtainable in the Neilgherries for the cultivation of the less temperate species of Cinchona, such as *C Succirubra*,

¹³⁰ W. Jameson to F. B. Outram, No. 439, 11 September 1859. Home, Public, 13 January 1860, 18–27 A (NAI).

¹³¹ T. Anderson to Secretary, Government of Bengal, 30 June 1868, Home, Public, 29 August 1868. 34–35 A (NAI).

¹³² J. Broughton to Government Fort St George, Revenue department, 31 August 1870, Ootacamund. Home, Public, 13 May 1871, 99–100 A (NAI).

¹³³ Jameson to Outram. Home, Public, 13 January 1860, 18–27 A (NAI).

¹³⁴ *Ibid.*; Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

C Calisaya, and probably *C Nidita* and *Peruviana*, as well as *C Pahudiana*. For the temperate species of which we now possess *C Micrantha* and *C Lancifolia*, . . . *C Peruviana* . . . that will almost withstand a slight fall of snow, we must look for a proper home in the moist region of Darjeeling and the damp deep inner valleys of Eastern Kumaon.¹³⁵

Such confident and precise recommendations were often followed by cautious caveats. Once again, various 'idiosyncrasies'¹³⁶ of the material life of these plants were elaborated to suggest how the sustenance of cinchona plants in British India continued to be both plausible and difficult. Various reasons were extended to explain why the identification of suitable sites for cultivating different species of cinchonas in British India remained arduous. First, knowledge about the physical characteristics of different varieties of cinchonas was shown as far from clear. It made the search for suitable localities appear as difficult. For example, D. Macpherson, the Inspector General of Hospitals, Madras Presidency, was amazed by the striking differences amongst 'authorities' and 'best informed writers' regarding the altitude where the species *Josephiana* thrived.¹³⁷ The cinchona trees were described as extremely sensitive to changes in altitude. An error of 500 feet could have had an adverse impact on the health of the trees.¹³⁸ Such varied understandings of the altitude conducive to the survival of these plants, Macpherson predicted, would make the search for suitable sites in India prolonged and difficult. Secondly, these converged with considerable confusions involving the precise identities of the seeds and plants that were transmitted to British India. Such confusions were manifested in official accounts in different ways. Superintendents of different botanical gardens in India or Ceylon tended to doubt the projected identities of certain varieties of cinchonas they received. It appears from the official correspondence that different species of cinchonas were not always absolutely rigid, inflexible categories. Instead, these appeared more as subjective labels. The identities of different varieties of cinchonas could often be a subject of debate amongst contending officials.¹³⁹ Thirdly, it was suggested that the

¹³⁵ Anderson to Grey. Ibid. (NAI).

¹³⁶ G. E. Shaw, *Quinine Manufacture in India* (London: Institute of Chemistry of Great Britain and Ireland, 1935), 3.

¹³⁷ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI); Anderson to Grey. Home, Public, 16 December 1861, 26–30 A (NAI); D. Macpherson to J. Boudillon, No. 7, Fort St George Ootacamund, 5 February 1861. Home, Public, 25 April 1861, 34–35 A (NAI).

¹³⁸ Junguhn to Governor General of Netherlands India. Home, Public, 16 December 1861, 26–30 A (NAI).

¹³⁹ T. Anderson, 'First Annual Report on the Experimental Cultivation of the Quiniferous Cinchona in British Sikkim from 1 April 1862 to 30 April 1863', 'Appendix'. Home Public, 19 August 1863, 85–87 A (NAI).

'vital properties' of seeds and plants were often lost in transit. This was mainly caused by unexpected delays during the long journey from South America. As principal distinguishing features became obscured by these changes, the identities of different groups of seeds in bags or Wardian cases often blurred.¹⁴⁰ Finally, careless receiving officers in the Calcutta or Bombay ports were often warned against ignoring labels and mixing up different species of cinchonas together. These made the selection of suitable sites difficult as 'the locality that suits one species may be quite unfitted for another'.¹⁴¹

Government files therefore predicted inevitable delays in the selection of suitable sites for cinchona plantations. It was proposed that the planting of every variety would be tried in different locations.¹⁴² Sites, which were found unsuitable for most species would be discarded, and the trials would shift to another location. These trials would be pursued until the most suitable sites for the different species of cinchonas were identified. These efforts to locate 'suitable spots' for cultivating different varieties of cinchonas in the 1860s were shown to constitute a series of 'experiments'. As part of these experiments (see Figure 1.5), Anderson suggested the 'immediate establishment of nurseries on all the mountain ranges . . . where large tracts of forests are available, such as the Khasia hills, Eastern Himalayas, the mountains extending from Chittagong down to the Malayan peninsula'.¹⁴³ He got sheds erected at three different altitudes in Darjeeling.

Sheds have been erected at the plantation at three different heights, at 3743, 2500 and 1760 feet above the sea. In these I have placed a considerable number of all species i.e. *Succirubra* 100, *Officinalis* 100, *Micrantha* 50, *Calisaya* 2, *Pahudiana* 21; a total of 273 plants . . . They will afford at the same time some data concerning the comparative rate of growth of the species at different altitudes.¹⁴⁴

In British Sikkim as well as the Nilgiris several sites were chosen and then discarded in the early 1860s. In search of compatible altitude, temperature, humidity, shade and vegetation, the 'experiment' travelled from Sinchan in British Sikkim to neighbouring Sinchal. 'Cold of the

¹⁴⁰ Macpherson to Boudillon. Home, Public, 25 April 1861, 34–35 A (NAI).

¹⁴¹ Anderson to the Secretary, Government of Bengal. Home, Public, 13 January, 1860, 18–27 A (NAD).

¹⁴² Anderson to Grey. Home, Public, 16 December 1861, 26–30 A (NAI); T. Anderson, 'Report on the Cultivation of the Quineferous Cinchona at Darjeeling from the 1 April 1863 to 15 July 1864.' Home, Public, 31 January 1865, 94–98 A (NAI).

¹⁴³ Anderson to Grey. Home, Public, 16 December 1861, 26–30 A (NAI).

¹⁴⁴ Anderson, 'Report on the Cultivation.' Home, Public, 31 January 1865, 94–98 A (NAI).



Figure 1.5 Photograph of a cinchona nursery at Munsong in British Sikkim set up a few decades later. Credit: Wellcome Library, London.

winter' enforced a shift from Sinchal to Lebong.¹⁴⁵ The plantations further moved to a more 'suitable spot' on the 'south eastern slopes of a long spur from Sinchal' in June 1864. It was called Rungbee.¹⁴⁶ Anderson and his colleagues kept exploring newer locations for the experiment in eastern and northeastern British India. Similar experiments were organised in the Nilgiris. The search for suitable sites began almost simultaneously in Dodabetta, Neddivattam, Avalanche, Mercara, Annamalai and Coorg forests.¹⁴⁷ Markham proposed similar 'trials and experimental cultivation' of cinchonas in Mahabaleshwar, the 'high hills east of Goa', Wynaad, the Shervaroyes and 'mountains between Tinnevely and Travancore'.¹⁴⁸

Officials cautioned that such elaborate and widespread trials might involve a considerable length of time. Possible setbacks or definite

¹⁴⁵ Anderson, 'First Annual Report.' Home, Public, 19 August 1863, 85–87A (NAI).

¹⁴⁶ Anderson, 'Report on the Cultivation.' Home, Public, 31 January 1865, 94–98 A (NAI).

¹⁴⁷ Macpherson to Boudillon, No. 7, Fort St George Ootacamund, 5 February 1861. Home, Public, 25 April 1861, 34–35 A (NAI).

¹⁴⁸ Markham, *Travels*, 509–520.

delays figured in official reports as predictable and necessary costs of a long and difficult experiment. Thus, possible setbacks or delays could now appear as imminent and even necessary. These were foreseen as useful revelations in a long-standing scientific trial. These experiments, it was hoped, would be followed by more sustained and confident investments in the plantation of cinchonas; culminating eventually in the establishment of factories for the manufacture of quinine. Macpherson predicted that the project would require seven more years before it began to yield 'remunerative returns'.¹⁴⁹ In 1862, Anderson referred to his conversations with the Dutch managers of the cinchona plantations in Java. They were not expecting 'to obtain quinine in its full proportion until trees have acquired their full development in thickness as well as stature. That will not be attained under 40 or 50 years . . .'.¹⁵⁰

Thus, profitable re-colonisation of cinchonas in British India, not unlike the journey of these plants from South America, was foretold as a very long and tedious process. Such elaborate arrangements to govern and make sense of the cinchonas seem to have reconfirmed them as distant, delicate and difficult plants. The enigma about these recalcitrant plants was further magnified by the setting up of similar 'experimental trials and cultivation' not only in the Nilgiris, but also in various sites across the British Empire including Peradenia and Nuwera Ellia in Ceylon, Sikkim, Bhutan and Khasia Hills in the Eastern Himalayas, Yoonzaalen Hills in British Pegu and various spots in Trinidad and Jamaica.¹⁵¹

'Indian Plantations'

Experimental plantations also emerged as sites for the relative profanation of cinchonas. Here, through the everyday acts of handling, trenching, planting, carrying, shedding, enclosing, discarding and replacing them, the cinchonas gradually became more mundane in the mid-1860s.¹⁵² Private investments in cinchona experiments began in 1862

¹⁴⁹ Macpherson to Boudillon, No. 7, 5 February 1861. Home, Public, 25 April 1861, 34–35 A (NAI).

¹⁵⁰ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

¹⁵¹ Markham, *Travels*, 509–520.

¹⁵² Government of Madras to Secretary of State for India, No. 57, 24 August 1869, Madras in Anonymous (ed), *East India, Chinchona Cultivation (Copy of All Correspondence Between the Secretary of State for India and the Governor General, and the Governors of Madras and Bombay, Relating to the Cultivation of Chinchona Plants from April 1866 to April 1870)* (London: House of Commons, 1870), 218 <http://books.google.co.uk/books?id=bfKAAAAYAAJ&printsec=frontcover#v=onepage&q&f=false> (retrieved on 1 May 2013).



Figure 1.6 Photograph of a cinchona tree in British Ceylon, 1882. Reproduced by kind permission of the Syndics of Cambridge University Library, Shelfmark: Ms. ADD. 7957_6_55. F.H.H. Guillemard Photographs.

in Ceylon¹⁵³ and extended subsequently to Kangra valley, Assam,¹⁵⁴ Darjeeling¹⁵⁵ and Malabar.¹⁵⁶ The supposedly exclusive status of cinchonas was compromised when in the private estates these thrived in the intimate company of tea, teak and coffee plants.¹⁵⁷

Besides, expediencies of private planters revised the geographies of certain species of cinchonas. These plants (see Figure 1.6), it was now argued, could survive in more eclectic geographical conditions than it was previously assumed. Private experiments examined, for example, whether cinchonas could be accommodated within previously acquired tea estates. In such cases geographies of cinchonas began to follow the set

¹⁵³ Markham, *Travels*, 511.

¹⁵⁴ 'Appointment of a Committee for Conducting Experiments with the Alkaloids, besides Quinine, which the Cinchona contains', Home, Public, 26 February 1866, 58 A (NAI).

¹⁵⁵ T. Anderson, 'Report on the Cultivation of Cinchona at Darjeeling from 1 April 1865 to 31 March 1866', Home, Public, October 1866, 21–22 (NAI).

¹⁵⁶ A. Fraser to the Secretary, Government of India, P.W.D, No. 139–7 F, 6 May 1868. Home, Public, 4 July 1868, 57–63 A (NAI).

¹⁵⁷ T. Anderson to the Secretary, Government of Bengal, 30 June 1868, Botanical Gardens Calcutta. Home, Public, 29 August 1868, 34–35 A (NAI).

trajectories of existing tea plantations. In contrast with conventional wisdom, which had set the ideal habitat of *Cinchona Succirubra* plants at altitudes varying from 2000 to 3000 feet, it was suggested that this species could thrive, as well, along with tea plants on the private Selim Tea Estate at the foot of the Terai hills in North Bengal at an altitude of 350 feet above the level of sea.¹⁵⁸ Thus, when confronted with the realpolitik of private plantations the physical attributes of the cinchonas began to surface as much more flexible. By managing to survive in diverse geographical terrains these plants exposed themselves as less delicate and more robust than previously imagined.

At the same time, greater numbers of colonial officials were asserting themselves as spokespersons and experts of cinchonas. By the early 1870s, it was acknowledged on behalf of the government in British India that the phase of 'fair, patient, attentive and prolonged trials' was over.¹⁵⁹ Already in the mid-1860s government cinchona plantations had been set up at Rungbee (later renamed as Mungpoo) in British Sikkim and at various sites in the Nilgiris including Dodabetta, Neddivattam and Malkoondah. C. B. Clarke, who succeeded Anderson as the Superintendent of the Botanic Gardens in Calcutta and In-Charge of the Cinchona Cultivation in Bengal as well as his counterpart in Ootacamund, W. G. McIvor, asserted that these emerging 'Indian plantations'¹⁶⁰ were sites where newer knowledge about the cinchonas was being produced. The establishment of cinchona plantations in globally dispersed sites across various European colonies had diversified the prevalent geographies of these plants. These officials rejected the tendency to describe cinchonas in general or universal terms. Instead, they insisted that knowledge about cinchonas should incorporate the specific experiences of the managers of these colonial plantations.

Whether debating the appropriate techniques or suitable altitudes for planting cinchonas, Clarke or McIvor claimed to correct or add nuance to the existing insights of established botanists like Howard, Hooker or Junghuhn.¹⁶¹ Clarke and McIvor alleged that these existing authorities from their distant locations in London, The Hague or Dutch Java

¹⁵⁸ Anderson, 'Report on the Cultivation', Home, Public, October 1866, 21–22 (NAI).

¹⁵⁹ W. Jameson to C. A. Elliott, Secretary to Government, North Western Provinces, No. 90, 10 May 1873, Saharanpur. IOR/V/23/131 No. 6 Art 30 (BL).

¹⁶⁰ C. B. Clarke to Secretary, Government of Bengal, No. 202, 1 July 1870, Rungbee. Home, Public, 17 December 1870, 123–125 A (NAI).

¹⁶¹ Anderson, 'First Annual Report.' Home, Public, 19 August 1863, 85–87 A; Clarke to the Secretary, Government of Bengal. Home, Public, 17 December 1870, 123–125 A (NAI).

could not have immediate exposure to the specific vagaries experienced in the 'Indian plantations'. These managers of the emerging plantations in British India contested some of their generalisations about cinchonas. For instance, Clarke wrote an engaging review of Howard's second major book about the cinchonas, *The Quinology of East Indian Plantations* in 1870. Clarke criticised Howard's ignorance of the conditions in which cinchonas thrived in Bengal, while questioning his speculations about the most suitable altitudes in which these plants could survive.

The conclusions, though stated as general do not in many important points hold as good as regards the Bengal plantations . . . Howard opens the discussion of the proper elevation at which to grow Cinchonas in India in these words: 'Recent observations on this point may save the apparently useless attempt to cultivate these plants at a level below 4000 feet above the ocean', Upon this I remark that the whole of the 1,000,000 plants of *C Succirubra* at Rungbee are below that level. The species appears to thrive best at about 2000 feet elevation, and grows very well down to the river at 800 feet elevation.¹⁶²

Thus, Indian plantations did not witness the straightforward application of instructions conveyed from the distant 'centres of calculation' in Europe or Dutch Java. Instead, these were emerging as sites where conventional wisdom about cinchonas could be reexamined, and where newer claims to knowledge about cinchonas could be asserted. Unsurprisingly, experiences derived by managers in these colonial plantations soon formed the basis of a series of books on the art of cultivating cinchonas.¹⁶³

By the late 1860s, 'Indian plantations' began to feature as new destinations for training future managers of neighbouring plantations. When cinchona experiments were about to be initiated in British Burma in 1868, officials who required training like the Conservator of Forests in Burma, Captain W. J. Seaton, were not made to travel to distant 'natural' cinchona forests in South America or the plantations in Dutch Java. Instead, Seaton was deputed to the South Indian plantations in Ootacamund and the Nellumboor Teak plantations in Malabar

¹⁶² C. B. Clarke to the Secretary, Government of Bengal, No. 165, 10 February 1870, Botanic Gardens Calcutta. Home, Public, 12 March 1870, 157 A (NAI).

¹⁶³ W. G. McIvor, *Notes on the Propagation and Cultivation of the Medicinal Cinchonas, or Peruvian bark Trees* (Madras: Graves, Coodson, 1863); G. King, *A Manual of Cinchona Plantation in India* (Calcutta: Office of the Superintendent of Government Print, 1880).

for receiving training and acquiring knowledge in the art of managing cinchonas.¹⁶⁴

'A Botanical Curiosity'

Thus various cultures of plantations from the mid-1860s hinted at the gradual transformation of cinchonas into more tameable, accessible and everyday objects in British India. Still, the predominant image of the plants as invaluable rarities persisted. Cinchonas were constructed not only as objects of botanical knowledge and plantation capital, but also as materials which could arouse and sustain curiosities across an expansive imperial world. In course of the decade and beyond, these plants found themselves empowered to reinforce various imperial protocols, processes, desires and hierarchies.

Cinchonas were amongst the few objects which bound up the distant corners of the British Empire into a globally interconnected political entity. Cinchonas brought officials in British India into immediate contact with counterparts in other parts of the Empire. As we will see, the journeys of British officials posted in Burma like Captain Seaton were not exceptional events. Cinchonas necessitated correspondence between Anderson, the Superintendent of Botanic Gardens in Calcutta, McIvor, the Superintendent of the Botanic Gardens in Ootacamund in the Nilgiri hills, Mr Thwaites, the Director of the Royal Botanic Gardens of Peradenia, Dr Brandis, the Conservator of Forests in Pegu, and Mr N. Wilson, the Superintendent of the Botanic Gardens in Jamaica. Discussions concerning techniques of managing cinchonas were often followed by exchanges of plants as well as officials located at different sites.¹⁶⁵ In a letter Anderson thanked the Director of the Royal Botanical Gardens at Kew, William Hooker, for nominating Gustav Mann as the head gardener in charge of the cinchona experiments in Darjeeling. 'Mann had just returned from the West Coast of Africa, where he had greatly distinguished himself in the capacity of Government Botanist . . .'.¹⁶⁶ These routine interactions between personnel inhabiting dispersed locations and disparate contexts were amongst the many ways the British Empire was crystallised not only as an ideological configuration, but also as an extensive machinery of governmental enactments.

¹⁶⁴ Fraser, to Secretary, Government of India, Public Works Department. Home, Public, 4 July 1868, 57–63 A (NAI).

¹⁶⁵ Markham, *Travels*, 511, 518.

¹⁶⁶ Anderson, 'Report on the Cultivation.' Home, Public, 31 January 1865, 94–98 A (NAI).

At the same time, these exchanges were not confined within the British Empire. Figure 1.7 and Figure 1.8 indicate that cinchonas also figured as objects of exchange between empires. Such exchanges could take either the form of gifts or collaborations. In the early 1860s, different colonial governments exchanged cinchona seeds and plants as gifts. Cinchonas began to feature as valuable plants that symbolised good will. In the early 1860s, the English government reportedly placed up to 800 plants at the disposal of the French Governor General in Algeria.¹⁶⁷ Again in June 1866, a consignment of many thousands of cinchona seeds was despatched by the Madras Government to be sown in Mexico.¹⁶⁸ Similarly, the Dutch Government in Java presented cinchona seeds and plants to British India in different moments in the 1860s.¹⁶⁹ The Governor General of Dutch Java, for instance, wrote to the Governor General of British India from Buitenzorg in June 1861: '...The successful issue of the cultivation of the Peruvian bark in the Island of Java enables me to place at the disposal of the British Government 500,000 seeds, about 100 or 200 seedlings of the *Chinchona Encumaeifolia*, and from 50 to 100 plants of the *Chinchona Calisaya*...'.¹⁷⁰ In April 1865, the Botanical Gardens in Calcutta was reported to have received an assortment of 200 seeds belonging to the *Cinchona Calisaya* variety from Dr Junghuhn, the Principal Inspector of the cinchona cultivation at Dutch Java. Anderson revealed a brief history of those seeds; the seeds were produced in Java in one of the cinchona trees Junghuhn had brought from the Botanic Gardens in Leiden. Those trees, it was claimed, had been raised from seeds presented to the Dutch Government in the early 1850s from Bolivia by Weddell, the French botanist.¹⁷¹ Such gift giving was often reciprocated by the British Indian officials.¹⁷²

Cinchonas enabled collaborations between competing empires. From the early 1860s senior officials from British India travelled into Dutch Java to study proliferating cinchona plantations. Most significant amongst them were Thomas Anderson, the Superintendent of the Botanical Gardens in Calcutta and D. Macpherson, the Inspector General of Hospitals, Madras Presidency. In his account of his trip to Java,

¹⁶⁷ Planchon, *Peruvian*, 46.

¹⁶⁸ Government of Madras to Secretary of State for India, No. 7, 26 June 1866, in Anonymous (ed), *East India, Chinchona Cultivation*, 15.

¹⁶⁹ Junghuhn to Governor General of Netherlands India, Home, Public, 16 December 1861, 26–30 A (NAI).

¹⁷⁰ Ibid.

¹⁷¹ Anderson, 'Report on the cultivation'. Home, Public, 31 January 1865, 94–98 A (NAI).

¹⁷² Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).



Figure 1.7 A sample of *Cinchona Pahudiana* from Java cultivated in Nilgiris, 1877. Credit: Wellcome Library, London.



Figure 1.8 A sample of *Cinchona Officinalis* from Madras cultivated in Java. Credit: Wellcome Library, London.

Anderson devoted an entire section towards acknowledging the support he received from the Dutch government in Java. He claimed to have received assistance ‘at every step’: These included arrangement of rest-houses in the interiors, supply of ‘ample relay of coolies’, ‘trained plant collectors’, ‘servants’, horses and wardian cases. He recounted how he received generous logistical support from the Acting Governor General of Netherlands India, The Resident of the Preanger Regencies and the Regent of Bandung. In his journeys into the interiors of Dutch Java, Anderson was joined by the Geologist to the Prussian embassy in Java, Baron Von Richthofen, as well as leading Dutch experts of the Javanese plantations, de Vrij and Junghuhn. These Prussian and Dutch officials accompanied Anderson almost ‘on all occasions satisfying’ his ‘curiosity on every point’. Anderson claimed to benefit from the inputs he received about the possible geographies of cinchona plantations from these officials. On his return in February 1862, he reported to have brought 40000 seeds and 412 plants belonging to the *Cinchona Calisaya*, *Cinchona Pahudiana* and *Cinchona Lancifolia* species from Dutch Java

which were distributed in the Botanical Gardens in Calcutta and Ootacamund.¹⁷³

Such journeys, however, were not unidirectional. J. E. de Vrij, Superintendent of Chemical Researches in Dutch Java, published a book entitled *On the Cultivation of Quinine in Java and British India* in 1865. Markham wrote the preface to the English edition of the book. He claimed that de Vrij had visited the sites of experimental plantations in South India in the early 1860s and 'made a very satisfactory analysis of cinchona bark grown on the Nilgiri hills'.¹⁷⁴ Thus cinchonas occasioned the convergence of an eclectic set of botanists, chemists and travellers representing different imperial formations into a collaborative network. The Ecuador Land Company, for instance, was formed in 1859 to enable the French and British governments to collectively explore the cinchona forests in Ecuador. The company was to extend help in transplanting the cinchona trees from Ecuador to the British India and French Algiers. The suggestion was seriously considered although it did not materialise.¹⁷⁵ Besides, authorities in Dutch Java often advised the Government of India on a range of issues involving cinchonas.¹⁷⁶ As I have noted already, Dutch experts on cinchona plantations often wrote generous letters of reference in support of certain British Indian officials.¹⁷⁷ One cannot confirm whether such instructions were immediately acted upon, but the act of instruction was seldom contested. Therefore, much like cinchona plants and seeds, botanical officials, administrative instructions, and proposals for collaborations travelled beyond particular imperial boundaries. Planting cinchonas in the colonies seem to have been a shared project where the delineating protocols of imperial formations went blur. At the same time, however, such cultures of exchanging gifts and efforts of collaboration between designated imperial officials reinforced the French, Dutch and British Empires as distinctively tangible entities. These recurrent rituals of trans-imperial exchanges and collaborations, in turn, contributed in sustaining the image of cinchonas as invaluable plants.

Within British India, enthusiasm about cinchonas was not confined to the botanical establishments and the planters' communities within

¹⁷³ Ibid.

¹⁷⁴ J. E. de Vrij, 'Notice,' *On the Cultivation of Quinine in Java and British India* (London: G. E. Eyre & W. Spottiswoode, 1865).

¹⁷⁵ D. Williams, 'Clements Roberts Markham', 433.

¹⁷⁶ The Governor General of Netherlands India to the Viceroy and Governor General of British India, No. 185 A, 13 June, 1861, Buitenzorg. Home Public, 19 July 1861, 8–10 A (NAD).

¹⁷⁷ Dr Junghuhn to the Governor General of Netherlands India, 23 October 1861, Lembang. Home, Public, 16 December 1861, 26–30 A (NAD).

Madras and Bengal presidencies. By 1862 different provincial governments within British India had begun to consider organising cinchona experiments a matter of dignity. They often hankered for their share of cinchona seeds and plants even when supplies were not forthcoming. For instance, W. Jameson, the Superintendent of the Botanical Gardens in North Western Provinces, wrote to his counterpart in Calcutta, Dr Thomas Anderson, soliciting some cinchona plants in a ward's case. He received no reply. Jameson wrote again, this time to Mr A. Grote, a member of the Sudder Board of Revenue in Calcutta. Grote turned his request down. Thereafter, Jameson made similar requests to the Madras government. Jameson claimed that he had located suitable sites for experimental cultivation in the province, long before any seeds were promised to him.¹⁷⁸ In these letters, Jameson mentioned that two sites selected for the experiment in the province belonged to the territory of one Tiree Raja. Apparently, the Raja had agreed to 'make land available' for experiments. One cannot be sure from Jameson's letters whether the Raja willingly volunteered to be part of the project.

However, cinchona plants and seeds had emerged widely amongst local Rajas of the native states as objects of collections in the 1860s. The Madras government in June 1866 published a long list of individuals and agencies who on request, were distributed samples of cinchona plants growing in the Nilgiris.¹⁷⁹ The list, amongst other suggestive information, reveals that the Rajas of Travancore and Poonganoor had requested and were then supplied with cinchona plants from the emerging plantations in the Nilgiris. A closer study of the list suggests that cinchonas had by the mid-1860s aroused the curiosities and commercial ambitions of a range of individuals and institutions located in distant sites. Requests for cinchonas were received not only from different stations within British India particularly South India, Central Provinces, Punjab, Cachar and Assam, but also from places situated as far as Rangoon, Java, Melbourne, Wellington, Mauritius, Reunion, Algiers and Jamaica. Amongst the applicants were those we have already encountered in this chapter: noted botanists Dr Thomas Anderson, Superintendent of the Botanical Gardens in Calcutta, Dr W. Jameson, the Superintendent of the Botanic Gardens in North Western Provinces, and Dr Junghuhn, the Principal Inspector of cinchona cultivations at Java. Requests appeared to have been made on behalf of institutions of state as well as private business groups, for example, Royal Gardens at Mauritius, French

¹⁷⁸ W. Jameson to G. Couper, No. 524, 20 September 1862, Kumaon. Home, Public, 15 October 1862, 14–16 A (NAI).

¹⁷⁹ Home Public, July 1866, 129 B (NAI).

government at Algiers, Messrs Thompson Shaw and Company amongst others. Similar applications were also received from the Governor Generals of Java and Goa, Governors of Vizagapatnam, Bombay and Madras, Chief Commissioner of Nagpore, Collectors of Belgaun and Honore. The list bore names of hundreds of other individuals. Those names were preceded by a wide range of titles: Mr, Professor, Dr, Reverend, Colonel, Captain, Major, General and so on. These suggest that individuals interested in acquiring cinchonas could be private individuals or personnel employed in different positions in the colonial military establishments or civil administrations. They could be academics, physicians or missionaries.¹⁸⁰ It appears that collecting cinchonas had emerged as an obsession across the colonial world. Possessing cinchonas figured not only as a symbol of significant status and prestige, but also as an expression of many attributes of Victorian respectability ranging from commercial enterprise and scientific inquisitiveness to benevolence.

Unsurprisingly therefore British Indian cinchonas attracted the attention of antiquarians, artists and keepers of imperial museums. Since very early in the 1870s different varieties of cinchonas growing in India appeared to make their ways as 'botanical curiosities'¹⁸¹ to museums and exhibitions in Europe and the United States.¹⁸² Cinchonas also began to circulate as objects of contemporary global news. Apart from recurrently finding expression in the sketches by Anglo-Indian artists (see Figure 1.9 and Figure 1.10), the progress of 'Indian plantations' was commented on in newspapers published from places as distant as Singapore, Brisbane and Wellington in the 1870s.¹⁸³ In vernacular medical marketplaces across British India, for example in Bengal, the arrival of cinchonas witnessed many publications in its praise as well as a series of advertisements about indigenous substitutes for quinine.¹⁸⁴

¹⁸⁰ Ibid.

¹⁸¹ Home, Medical, May 1886, 37–38 A (NAI); Anderson to Grey. Home, Public, 22 February 1862, 54–58 A (NAI).

¹⁸² Home, Public, 11 March 1871, 36–37 A; Home, Medical, April 1882, 20–22 A (NAI).

¹⁸³ Anonymous, 'The Cinchona Plant', *The Brisbane Courier* (Saturday, 8 February 1868), 6 <http://trove.nla.gov.au/ndp/del/article/1318474> [retrieved on 26 December 2012]; Anonymous, 'The Cultivation of the Cinchona Plant', *Wellington Independent*, 22, 2667 (14 April 1868), 5. <http://paperspast.natlib.govt.nz/cgi-bin/paperspast?a=d&d=W118680414.2.25&e=----10-1--0WILLIAM+EDWARD+KNOWLES-all> [retrieved on 18 March 2013]; Anonymous, 'Cinchona Culture', *The Straits Times* (4 June 1870), 1, <http://newspapers.nl.sg/Digitised/Article/straitstimes18700604.2.7.aspx> [retrieved on 18 March 2013].

¹⁸⁴ See for instance, Anonymous, 'Cinchona', *Swasthya*, 3, 5 (1899), 145–148; Anonymous, 'Sarvajvarankusha,' *Education Gazette and Saptahik Vartabaha* (9 March 1888), 733; G. Nandi, 'Malaria Jvarey Dasyadi Pachan.' *Chikitsak* 1, 1 (1889), 70–72.

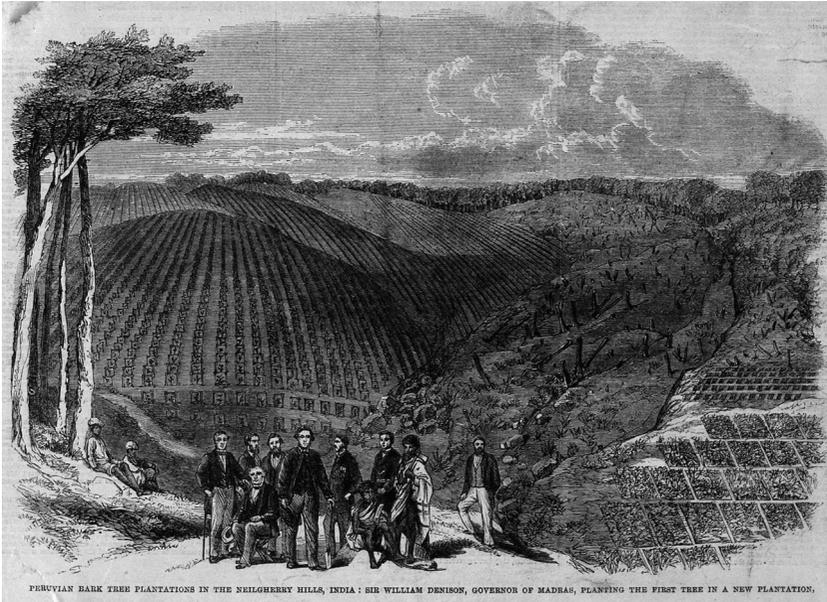


Figure 1.9 Wood-engraving of the planting of the first cinchona tree in a new plantation in the Nilgiris. Credit: Wellcome Library, London.

The establishment of cinchona plantations in the eastern Himalayas provided one of many occasions in which the Bengali *bhadraloks* came in immediate contact with the interiors of British Sikkim. Over time, destinations like Mungpoo became conceivable as locations for *bhadralok* livelihood, memoirs and nostalgia.¹⁸⁵

Earliest photographic images (see Figure 1.11 and Figure 1.12) of cinchona plantations show keen local inhabitants engaged in voluntary labour in the misty landscapes of British Sikkim or Peradeniya in Ceylon. However, these photographic projections about eager labourers framed by the colonial state need to be read with caution. It is possible to argue that these photographs captured individuals who were often described in the published official correspondences as members of dispossessed 'hill tribes', discredited 'jhoom cultivators', 'Nepalese coolies', 'Lepchas' and convict labourers.¹⁸⁶ Introduced in South Asia in the immediate

¹⁸⁵ M. Devi, *Mungpote Rabindranath (Rabindranath in Mungpoo)* (Calcutta: Prima Publications, 1943).

¹⁸⁶ T. Anderson to Secretary, Government of Bengal, 30 June 1868, Botanical Gardens Calcutta. Home, Public, 29 August 1868, 34–35 A (NAI); Veale, *A Historical Geography of the Nilgiri Cinchona Plantations*, 252, 261–275.



Figure 1.10 Wood-engraving showing 'Balmadie's Cinchona Plantation Near Dolcamund, Madras Presidency' from the *Illustrated London News*, (10 February 1872), 132. Credit: Author's Copy.

aftermath of the mutiny of 1857 as a hallmark of humanitarianism, these plants quite soon found themselves implicated within broader histories of dispossession and incarceration.

Conclusion

The history of circulating and planting cinchonas in British India in the initial decades of 1850s and 1860s reveals the imbrications of imperial governance, botanical knowledge, materiality of plants and processes of commodification. Collapsing the distinction between biographical objects and public commodities proposed by Janet Hoskins, I have argued that the bureaucratic construction of cinchonas as a commodity was founded on assertions about their intense physicality.¹⁸⁷ This could take two apparently contradictory forms. At one level, cinchonas figured

¹⁸⁷ J. Hoskins, *Biographical Objects: How Things Tell the Stories of People's Lives* (New York and London: Routledge, 1998), 7–9.



Figure 1.11 Reproduced by kind permission of the Syndics of Cambridge University Library. Royal Commonwealth Society Library, Photograph collection of John Abercromby Alexander. (No infringement of copyright intended.) Shelfmark: RCS/Y303E_46. Circa 1880–1896. Photograph of local inhabitants engaged in cinchona plantations in Ceylon.

as lively objects which were sensible, delicate and feminine. Because they were projected as exotic and fragile beings, it was predicted that it would be difficult for them to be transported to and to thrive in British India. At the same time, the exigencies of economic botany shaped the projection of cinchonas as plausible objects of plantation, which could survive, grow and proliferate in British India. The physical properties of cinchonas were upheld as suitably malleable. Cinchonas appeared adaptable to the textures of landscapes, and the emerging expertise of planters, botanists, labourers and bureaucrats in British India.

The history of cinchonas in British India unfolded in the wider context of extensive engagement of British imperial actors with a range of plants. These engagements were often structured by the interactions between metropolitan institutions like the Royal Botanic Gardens at Kew, on the one hand, with emerging plantations and botanical gardens



Figure 1.12 Photograph of local inhabitants labouring at Munsong cinchona plantations in British Sikkim, India. Credit: Wellcome Library.

in distant corners of the colonial world, on the other.¹⁸⁸ The entanglement of imperial power, botanical knowledge and plantation economy, as explored in this chapter, bears resonance with what existing histories have indicated in relation to other botanical commodities including indigo, cotton and rubber in South Asia and beyond.¹⁸⁹

While imperial rule predominantly occasioned and mediated the sustenance of the commodity status of cinchona in British India in these decades, Empire itself, following an expression of Donna Haraway, was ‘becoming with’ cinchonas.¹⁹⁰ It is possible to suggest that various organisms, materials and institutions which shaped the history of cinchonas in the late 1850s and 1860s (for example, plants, barks, trees, bottles, photographs, sketches, bureaucratic correspondence, travel narratives, wardian cases, steamers, herbariums, nurseries or plantations) were as much tools of a preordained Empire as they were ingredients of an imperial apparatus in the making.

While being shaped as objects of governance and knowledge, as commodities and as materials, cinchonas, as I have noted, held together an extensive imperial network of bureaucrats, botanists, explorers, private planters, local Rajas, distant newspaper reporters, contending vernacular advertisements, photographers and illustrators amongst others. In the process, cinchonas consolidated as well as revealed fissures within what Richard Drayton calls an ‘improving plantocracy’.¹⁹¹ Apart from figuring as subjects of routine bureaucratic correspondence, cinchonas also engendered more spectacular circulation of personnel, gifts and ideas within and between the British, Dutch and French Empires. These plants emerged as one of the various objects which crystallised the British Empire as a globally dispersed and yet interconnected machinery of administrative predicaments and enactments.¹⁹²

¹⁸⁸ Drayton, *Nature’s Government*; Brockway, *Science and Colonial Expansion*.

¹⁸⁹ A. Ramesh, ‘Scientific Commodities, Imperial Dreams’, *Studies in the History and Philosophy of Biological and Biomedical Sciences* (2016), <http://dx.doi.org/10.1016/j.shpsc.2016.04.006> [retrieved on 10 July 2016]; P. Kumar, *Indigo Plantations and Science in Colonial India* (New York and Cambridge: Cambridge University Press, 2013); S. Hazareesingh, ‘Cotton, Climate and Colonialism in Dharwar, Western India, 1840–1880’, *Journal of Historical Geography*, 38, 1 (2012), 1–17; B. Kar, ‘Historia Elastica: A Note on the Rubber Hunt in the North-Eastern Frontier of British India’, *Indian Historical Review*, 36, 1 (2009), 131–150.

¹⁹⁰ D. Haraway, *When Species Meet* (London: University of Minnesota Press, 2008), 2, 23–27.

¹⁹¹ Drayton, *Nature’s Government*, 115.

¹⁹² For a recent work which comments on the makings of the British Empire through everyday practices of governance, see J. Wilson, *The Domination of Strangers: Modern Governance in Eastern India, 1780–1835* (Basingstoke: Palgrave Macmillan, 2008), 4, 9–18, 183–185.

Cinchonas exposed not only some of the commercial temptations of British Empire, but also featured as amongst Empire's many ideological justifications. Particularly, in the immediate aftermath of the Sepoy mutiny of 1857, cinchonas were upheld as emblematic of benevolent Victorian governance. The arrival of cinchonas in British India was presented as ushering in 'the pleasantest episode of British rule' which would be characterised by the charitable dispensation of medical relief to the colonial poor.

Such ideological talk about colonial munificence, however, was linked intimately with the reinforcement of a series of imperial prejudices and violence. The early efforts of planting cinchonas in British India reveal how in imperial history processes of anthropomorphism and dehumanisation happened hand in hand. Cinchonas were ascribed with lively as well as human-like attributes of being sensible,¹⁹³ delicate,¹⁹⁴ feminine¹⁹⁵ and idiosyncratic.¹⁹⁶ Resonating with the wider literature about indentured labourers, colonising administrators and soldiers, it was feared that these plants turned 'sickly' while undergoing acclimatisation in an alien climate.¹⁹⁷ At the same time, the beginning of cinchona experiments provided an excuse to label the Peruvian Indians of South America, or 'hill tribes' in British India or colonial 'primitives' more generally as lesser humans. Apart from being accused of 'barbarous meddling',¹⁹⁸ they were often denounced variously as people associated with 'rude cultivation',¹⁹⁹ or as inhabitants of the 'state of nature',²⁰⁰ who deserved colonial tutelage because of their 'reckless short-sightedness'.²⁰¹ The planting of cinchonas in British India, it was hoped, would sustain the transformation of 'wild mountain sides into beautiful public garden(s)'.²⁰² Underscoring the deeper commercial and symbolic relevance of these plants, such aesthetic appeal appeared to justify the enforced employment in the emerging Nilgiri plantations of

¹⁹³ Junghuhn to the Governor General of Netherlands India. Home, Public, 16 December 1861, 26–30 A (NAI).

¹⁹⁴ Anderson to Grey. Home, Public, 22 February 1862, 54 to 58 A (NAI).

¹⁹⁵ Hooker, *Inaugural Dissertation*, 'Title Page'.

¹⁹⁶ Shaw, *Quinine Manufacture in India*, 3.

¹⁹⁷ Anderson to Grey. Home, Public, 22 February 1862, 54–58 A; Anderson, 'Report on the Cultivation'. Home, Public, 13 September 1862, 30–31 A (NAI).

¹⁹⁸ Philip, *Civilising Natures*, 260.

¹⁹⁹ Anderson to Secretary, Government of Bengal. Home, Public, 29 August 1868, 34–35 A (NAI).

²⁰⁰ T. Wilson, *An Enquiry Into the Origin and Intimate Nature of Malaria* (London: Henry Renshaw, 1858), 14, 106, 107.

²⁰¹ Markham, *Travels*, 338. ²⁰² *Ibid.*, 371.

Chinese convict labour from the Straits Settlements,²⁰³ and the displacement of Nepalese coolies and Lepchas from forest lands and traditional livelihoods to make room for the plantations in British Sikkim.²⁰⁴ Thus, like most other objects of plantations the cinchonas were entangled within broader regimes of marginalisation. The augmentation of these plants to the status of lively valuable beings was founded upon the persistence of dehumanising colonial prejudices reflected in expressions such as primitives, wild, hill tribes and barbarous.²⁰⁵

A new geography of cinchonas emerged by the 1860s. Between the late seventeenth and early nineteenth centuries, the history of cinchonas was shaped, to a considerable extent, by explorers, traders, apothecaries, alkaloid chemists and pharmacologists across the Atlantic.²⁰⁶ As objects of knowledge and commerce, the cinchonas were confined predominantly (if not exclusively) to the networks of circulation between 'natural forests' in Spanish America and sites within Europe and North America. With the integration of the cinchonas into the emerging global plantation economy in the mid-nineteenth century, comparable to the case of rubber transplantation, these plants began to circulate more widely than ever before.²⁰⁷ Their circulation now extended to the distant corners of the colonial world engendered by British, French and Dutch Empires. Colonial plantations in Java, Ceylon, Jamaica, St Helena, Chiffa in Algeria,²⁰⁸ Bhutan and Khasia Hills in the Eastern Himalayas; Yoonzaleen Hills in British Pegu²⁰⁹ emerged as new homes of cinchona plants. Those associated with planting cinchonas in Bengal and Madras presidencies in British India were locked increasingly in correspondence with institutions and individuals located across the Indian Ocean world and beyond in Jamaica, Java, Wellington, Mauritius, Algiers, Ceylon, Reunion and

²⁰³ Veale, *A Historical Geography*, 261–275.

²⁰⁴ Anderson to Secretary, Government of Bengal. Home, Public, 29 August 1868, 34–35 A (NAI).

²⁰⁵ For colonial constructions of the 'wild', see K. Sivaramakrishnan, *Modern Forests: Statemaking and Environmental Change in Colonial Eastern India* (Stanford: Stanford University Press, 1999), 49, 83; A. Skaria, *Hybrid Histories: Forests, Frontiers and Wilderness in Western India* (New Delhi: Oxford University Press, 1999), 39–41. For the significance of the 'primitive' in modern imperial history see for instance, J. Fabian, *Time and the Other: How Anthropology Makes its Object* (New York: Columbia University Press, 2002); P. Banerjee, *Politics of Time: 'Primitives' and History-Writing in a Colonial Society* (New Delhi: Oxford University Press, 2006).

²⁰⁶ Bleichmar, 'Atlantic Competitions', 242–244.

²⁰⁷ W. Dean, *Brazil and the Struggle for Rubber: A Study in Environmental History* (Cambridge: Cambridge University Press, 1987), 4.

²⁰⁸ J. Broughton, to Acting Secretary, Government Fort St George, Revenue Department, 31 August 1870, Ootacamund. Home, Public, May 13 1871, 99–100 A (NAI).

²⁰⁹ Markham, *Travels*, 509–520.

Rangoon.²¹⁰ In the next chapter, I will explore corresponding shifts in the geographies of the disease, which the cinchonas were most consistently attributed to heal. Projected shifts in the geographies of malaria appeared to coincide with relocations within geographies of the cinchonas.

²¹⁰ Home Public, July 1866, 129 B (NAI).